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Indian Journal of Anesthesia and Analgesia	Bi-monthly	7500	7000	586	547
Indian Journal of Cancer Education and Research	Semiannual	9000	8500	703	664
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Journal of Orthopedic Education	Triannual	5500	5000	430	391
Journal of Pharmaceutical and Medicinal Chemistry	Semiannual	16500	16000	1289	1250
Journal of Practical Biochemistry and Biophysics	Semiannual	7000	6500	547	508
Journal of Radiology	Semiannual	8000	7500	625	586
New Indian Journal of Surgery	Bi-monthly	8000	7500	625	586
Ophthalmology and Allied Sciences	Triannual	6000	5500	469	430
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International Journal of Forensic Sciences	Semiannual	10000	9500	781	742
Journal of Forensic Chemistry and Toxicology	Semiannual	9500	9000	742	703
Community and Public Health Nursing	Triannual	5500	5000	430	391
Indian Journal of Surgical Nursing	Triannual	5500	5000	430	391
International Journal of Pediatric Nursing	Triannual	5500	5000	430	391
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International Journal of Political Science	Semiannual	6000	5500	450	413
Journal of Social Welfare and Management	Triannual	7500	7000	586	547
International Journal of Food, Nutrition & Dietetics	Triannual	5500	5000	430	391
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Assessment of Readiness in Mothers for Home Based Care of LBW Babies: A KAP Study

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Abstract

Introduction: Low birth weight (LBW) is the global indicator of public health and is the most important determinant for neonatal and infant survival. Apart from Essential Newborn care, as mentioned in Home Based Newborn Care (HBNC) guidelines, mothers of these babies need to be aware of their special needs.Therefore, this study was conceived, to assess knowledge of mothers regarding LBW care at home. *Objective:* To assess knowledge regarding the readiness of mothers for home-based care of LBW babies with respect to Providing warmth, Breastfeeding, Prevention from infection, Immunization, Kangaroo Mother Care, Supplementation and Assessing the Dangersigns. *Methodology:* A cross-sectional, analytical, Directive open-ended questionnaire-based study over three months duration in 1498 Postnatal Mothers admitted in tertiary care institute. Questionnaire was framed and collected data was analyzed with the help of IBM-SPSS version 2016. *Results & Conclusion:* Considering the Inclusion and Exclusion criteria, 1498 mothers completed the questionnaire. Awareness with respect to "Providing warmth" 24.64%, "Breastfeeding" 19.02%, "Prevention from infection" 17.66%, "Immunization" 59.39%, "Kangaroo Mother Care" 18.35%, "LBW Supplementation" 20.66%, and that about the Danger signs was 10.98%. This awareness was low irrespective of Literacy, Age of Mother, Parity, Rural or Urban Status and multiple ANC Visits. HBNC programs involving community participation must insist on problems of LBW and prepare mothers for the same.

Keywords: Low Birth Weight; Readiness; Home Based Care; Newborn

Introduction

Infections (including sepsis, pneumonia, diarrhea, and tetanus), prematurity, and birth asphyxia are the major causes of death in the neonatal period. The most vulnerable period of a newborn's life is the period during birth and the first week of life. (74% newborns die within the First week and of that 40% on Day One) [1].

Low birth weight (LBW) is a global indicator of public health and is the most important determinant for neonatal and infant survival. About 66% of babies are LBW [2]. In India, 3,341,000 babies are born too soon each year and 361,600 children under five die due to direct preterm complications [3]. Low birth weight babies are born at term or as preterm. Apart from Essential Newborn care, as mentioned in HBNC guidelines, mothers of these babies need to be aware of their special needs.

NMR India is 24/1000 as per SRS 2016 [4]. Reduction achieved is by only one point. Approximately 20% of all deliveries take place at

home. Out of all Institutional deliveries, nearly 45% mothers prefer to return to home within 48 hours after delivery posing a significant risk to the newborn. 54% of newborns die in the first week of life. Community-based Interventions have a role in reducing NMR though the impact is high when NMR is high > 50 [5].

Recognition of LBW baby in the community is a problem in low – middle-income countries [5]. LBW babies have many problems. Health education of such mothers should address all those issues. Though awareness about exclusive Breastfeeding is increasing, feeding of LBW needs special mention [6].

LBW babies are more vulnerable to all the Neonatal Complications. Special mention of Feeding problems required Assisted Feeding, Kangaroo Mother Care and Nutrition. One of the methods to reduce such complications is kangaroo mother care which improves growth and reduces morbidity in low birth weight infants. It is simple, acceptable and can be continued at home. It is a low-cost method of care of low birth infants, consisting of skin to skin care, exclusive breastfeeding and an early discharge with an adequate follow-up [7].

Therefore, this study was conceived, to assess knowledge of mothers regarding LBW care at home.

Objectives

To assess knowledge regarding the readiness of mothers for home-based care of LBW babies with respect to following domains–

1. Providing warmth.
2. Breastfeeding [8].
3. Prevention from infection.
4. Immunization.
5. Kangaroo Mother Care [9].
6. Supplementation.
7. Assessing the danger signs [10].

Materials & Methods

Type of study and study design: cross-sectional, analytical, directive open-ended, Questionnaire-based study

Duration: Period of 4 months

Setting: Tertiary Care Institute

Study population: Admitted Postnatal Mothers

Inclusion Criteria: Postnatal Mothers who delivered Low Birth Weight Baby

Exclusion Criteria

1. Mothers not willing.
2. Mothers with adverse pregnancy outcome.
3. Those not completing the interview.

Sample size

Convenience Sampling was done. Live birth rate or the number of postnatal mothers admitted to the tertiary care unit per day is approximately 60. Therefore, the expected total sample size of mothers to be included was 1504. Some respondents (n= 6) did not give complete responses and hence were excluded. Complete responses were obtained from 1498 mothers.

Data collection procedures

1. Consent of the mother was obtained.
2. The Questionnaire:
    a) A predesigned questionnaire in 3 different languages i.e. *Hindi, English, Marathi* was used for interviewing the subjects
    b) The questionnaire consisted of 20 questions directive open-ended questions,
    c) Validated by taking opinion from 5 experts,
    d) Tested as a Pilot project in more than 10 mothers,
3. For the interview:
    a) Only Female surveyor interviewed the Mothers,
    b) Interview in the vernacular language,
    c) The answers given were scored for a correct or incorrect response.
    d) A score of '1' was allotted for the correct answer and 'zero' for incorrect / don't know response.
    e) If an incomplete / incorrect answer was obtained, she was given correct information before going to the next question.

Confident analysis / statistical tools: Collected Data was analyzed with the help of IBM-SPSS version 2016.

Ethical considerations: Institutional Ethics Committee Clearance obtained**.**

Results

Total 1498 mothers completed the questionnaire. The demographic Profile and other maternal details were obtained as per Table 1. The Population had urban preponderance. Nearly 80% of deliveries were not identified or referred to this institute as high risk. A majority (92%) of mothers completed 4 or more ANC visits. Hematinics were received by 63% of mothers. The assessment results regarding 7 domains are depicted in Table 2.

Table 1: Profile Distribution Table of Frequency (%)

Profile	Category wise distribution			
Birth weight (gm)	1000-1500	1500-2000	2000-2500	
	4.36%	33.69%	61.95%	
Mother's Age (Years)	< 19	19- 35	>35	
	46.37%	50.28%	3.35%	
Parity	1	>1	>3	
	64.27%	25.98%	9.75%	
Place of Residence	Rural	Urban		
	26.71%	73.29%		
Ante Natal Checkup (Number of Visits to Health Facility)	< 4	> 4		
	7.53%	92.46%		
Supplements Taken (Total 100 Doses Completed)	Yes	No		
	63%	37%		
Education	illiterate	<10th Std	>10Std	Graduate and more
	28.75%	23.68%	45.3%	2.27%

Table 2: Domains assessed for Readiness of Mothers for Home Based Care of LBW Newborns

Domain	Answered and Demonstrated Correctly	Percentage of Mothers Unaware	Learning Point
Providing warmth	24.64%	75.36%	About 80% of motherswho delivered LBW babies in a Tertiary Care Institute were not prepared for LBW care at home.
Comprehensive understanding about Breast feeding	19.02%	80.98%	
Prevention from infection	17.66%	82.34%	
Immunization	59.39%	40.61%	
Kangaroo Mother Care	18.35%	81.65%	
Supplementation (Medicines)	20.66%	79.34%	
Assessing the danger signs	10.98%	89.02%	

Table 3: Summary of Studies regarding Awareness about Home Based Care of Newborns

Sr No.	Author	Topic	Sample Size	Compared Domain
1.	Aklilu AbrhamRoba et al. [11]	KAP of Kangaroo Mother Care by PostnatalMothers who Gave Birth to Preterm and Low Birth Weight Babies in Public Hospitals, Eastern Ethiopia	349 PNC Hospital Delivered Mothers	54.15% mothers practiced Kangaroo Mother Care in hospitals and also willing to continue at home
2.	Mrs. Kavita Bhoknal [12]	Effectiveness of Health Education Package on Knowledge and Practice Regarding Care of Low Birth Weight Babies (LBW) Among Post Natal Mothers	50 PNC Hospital Delivered mothers were selected by simple random sampling	It was noted that practice on care of LBW babies had significant association with educational qualification (x2=5.99), parity of mother (x2=8.06) at p<0.05 level
3.	Baqui et al. [13]	Newborn care in rural Uttar Pradesh	13167 women in Community delivered in last 2 years	Clean cord care 7% thermal care 5% and breastfeeding 5% ANC Visit 17%
4.	Arohi Dala [14]	A Cross-Sectional Study On Knowledge And Attitude Regarding Kangaroo Mother Care Practice Among Health Care Providers In Ahmedabad District	A cross-sectional study in 7 health centers in 145 HCP located in Ahmedabad district	Knowledge regarding LBW babies in 32.4% HCPs and only 33.1% could correctly enlist all components of KMC

5.	Elizabeth L Nabiwemba et al. [15]	Recognition and home care of LBW neonates: a qualitative study of knowledge, beliefs and practices of mothers in Iganga-Mayuge Health and Demographic Surveillance Site, Uganda	PNC Mothers (16) at Hospital + (10) at home	All mothers knew how to keep babies warm.
6.	Amolo et al. [16]	Knowledge of postnatal mothers on essential newborn care practices at the Kenyatta National Hospital: a cross sectional study	380 PNC mothers	More than 90% knew about breastfeeding. 99% did not agree with dry cord care. 10% knew neonatal danger signs

(Abbreviations: HCP: Health Care Personnel, PNC: Post Natal Care)

Discussion

Frequency Distribution and Risk of VLBW (Birth Weight less than 1500 gm)

In our study, it was noted that the Maternal Age at marriage less than completed 19 years is associated with a higher risk of VLBW (< 1500 gm) birth weight baby (RR 1.71). Birth spacing shorter than 3 years was noted in 90% mothers. Birth spacing less than 2 years was associated with an increased risk of VLBW baby (RR 0.64). Parity more than 3 and ANC Visits less than 4 did not show significant association with VLBW babies. Though this was not primary objective of this study, the association found was reported as a finding of interest.

Readiness of Mothers with respect to domains for Home Based Care of LBW babies

The general readiness of mothers for Home Based Care of LBW babies was assessed as poor, irrespective of the area of residence, (i.e. Urban/ rural), Age of the mother at the time of Marriage or delivery and 4 or More ANC visits. Poor preparedness despite being delivered at Tertiary Care center with Maternal Mortality of less than half of India Standards could be explained by the fact that due to high delivery load, and fast turnover, PNC mothers stay for just over 24 hours in Hospital.

It was observed that nearly 3 /4th of the mothers were not aware of various components of Essential Newborn Care, viz. keeping baby warm, feeding, Hygiene, immunization, identification of danger signs, more so about the care of LBW babies with respect to KMC, Prevention of Infection, Feeding, and Supplementation. A community-based survey done by Baqui et al. [13] reported poor KAP regarding ENBC in rural population. Various studies from other developing countries have reported better knowledge of Mothers (Amolo et al., Roba et al., Kavita Bhoknal, Nabiwemba et al.) depicted in Table 3.

Various authors have studied awareness of KMC in Community and in Health care workers. Our study found that 18.35% mothers were aware of KMC. Better (54.15%) awareness about KMC in mothers reported by Aklilu Abrha Roba et al. [11] can be due to emphasis in their Health Programs. Whereas a study from India, Arohi Dalal [14] reported that only 33.1% of Health Care Personnel could enlist all the components of KMC. Not many studies are available about awareness in Trained Personnel.

A similar disparity was noted about rates for correct practices for Breast Feeding. Amolo et al. [16] mentioned that in their study, more than 90% knew about breastfeeding, and a study from North India, Baqui et al. [13] reported only 5%, whereas that in our study was found to be 19.02%. Various studies across the globe have reported a varying degree of awareness about Breastfeeding. Rates of Early Initiation of BF and Exclusive feeding till 6 months are low in India. And the concern that it may still be lower in LBW babies with specific feeding issues.

Awareness regarding Immunization found 59.39% in our study whereas awareness about BCG and OPV (Birth dose) was 17.8% mentioned by Amolo et al. [16]. This better knowledge can possibly be due to very frequent IEC activities conducted and emphasis for immunization.

Awareness regarding Danger signs in LBW babies is important to improve health seeking behavior. Only 10.98% mothers in our study were aware of the Danger signs, finding which was similarly reported by Amolo et al. [16]. Healthy hygiene practices are necessary to prevent infections. In our study, 17.66% mothers answered and demonstrated correctly about dry cord care whereas it was reported to be only 7% by Baqui et al. [13].

Limitations of Our study

1. Recall Bias regarding some of the questions in the questionnaire.
2. All the preventive aspects of Low Birth Weight deliveries were not addressed to

keep the topic simple.

3. The study was not planned to include Simulation / Pre and Post Test. Hence, did not accomplish the demonstration Level of Learning Pyramid.
4. Whether the Mother would practice HBNC of LBW newborn after the session i.e. Follow up after discharge was not considered. (as it was not a part of this study design).

Strengths

1. Convenience sampling with a Sample size of 1498.
2. The Questionnaire was Validated by more than five Health Care Workers trained in Facility-Based Newborn Care and was tried on Pilot sample of 10 subjects and revised accordingly.
3. ACSM (Advocacy, Communication and Social Mobilization) Goals of Low Birth Weight care are addressed. While conducting the survey, the surveyor demonstrated the correct technique to the mother and the attendants.

Conclusions

The readiness of mothers for home-based care of LBW babies was poor with respect to Providing warmth, Breastfeeding, Prevention from infection, Immunization, Kangaroo Mother Care, Supplementation and Assessing the Dangersigns. Despite more than 4 ANC visits, were not found to be prepared for Home Based Care of LBW. Hospital Delivered mothers need to be educated before discharge. Awareness about immunization was relatively better. Though exclusive Breastfeeding was practiced, comprehensive knowledge regarding the same was lacking. The quality of ANC Visits and the outcome needs improvement as a majority of the respondents were unaware of any high-risk factor for LBW delivery.

Recommendation

All the contacts with Health facilities should emphasize on same check list based points for educating the community as well as the Health Workers at all levels. A quality improvement approach which can be more context and population-specific may help reduce the implementation gap. Networking of Public Health Facilities for Quality Improvement Initiative and a focus of system strengthening along with Infrastructure, Manpower, and Equipment for implementation of Policies is must.

Acknowledgment

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Abbreviations

ACSM – Advocacy Communication and Social Mobilization

ANC – Ante Natal Care

BF – Breast Feeding

ENBC – Essential New Born Care

HBNC – Home Based Newborn Care

IEC – Information Education Communication

LBW – Low Birth Weight

KAP – Knowledge Attitude Practices

NMR – Neonatal Mortality Rate

PNC – Postnatal Care

SRS - Sample Registration Survey

VLBW – Very Low Birth Weight

Conflict of Interest: None Declared

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A Study on Causes of Intrauterine Fetal Deaths in Tertiary Care Hospital

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Abstract

Objective: To find out the various causes and their frequency in cases of intra uterine foetal death. *Methods:* This study is conducted at the department of obstretics and gynaecology of M.P., Shah medical college and GG hospital, a tertiary care center during the period of 9 months between 1st April 2017 to 31st December 2017. Patients presenting after 28 completed weeks of pregnancy including patients in labour were included in this study. Patients were subjected to detailed history, examination, investigations and followed up before, during and after labour to find out the causes of iufd. *Results:* During the time period the total number of deliveries was 5702 and the total number of patients with intra-uterine foetal death was 190 (3.33%). The most common cause of intrauterine foetal death was meconium aspiration 46 (24%)antepartum hemorrhage (APH) in 32 cases (16.84%), followed by congenital anomaly in 11 (5.78%) cases, cord prolapse in 11 (5.78%) cases, PET in 10 (5.2%) cases and no cause found in 80 cases(42.10%). Out of these 80 cases 60 were uninvestigated cases who presented for the first time in labour room. *Conclusion:* Encouragement of antenatal visits is the most important factor in preventing fetal death as it is the group with highest fetal deaths followed by improving intrapartum monitoring to prevent fetal deaths due to meconium aspiration syndrome by timely interventions. Also identification of high risk cases and their prevention, management can reduce iud in these cases.

Keywords: Intrauterine Death; Stillbirth.

Introduction

Intrauterine fetal death has been variously defined by different authorities. While some define it as expiulson of products of human conception beyond 20 weeks of conception [1] others define it as expulsion of fetus weighing >500 grams(normally attained at 22 wks)[3]. Fetal mortality encompasses abortion as well as intrauterine death, while stillbirth is a more specific entity including only the fetal mortalities after 28 weeks of gestation. Intrauterine fetal death includes cases with expulsion of fetus which show no signs of life after birth i.e complete abscence of cardiac activity and absence of respiration and no movement of voluntary muscles [2]. Causes of fetal deaths at different ages of gestation are important to plan interventions aimed at controlling the mortality which causes great agony to the patients and her families.

Materials and Methods

It was a observational prospective hospital based study on all patients at the Department of Obstetrics and Gynaecology, Guru Gobind Singh Hospital, Jamnagar who delivered a still born child of >500 grams after 28 completed weeks of gestation. Detailed examination of all cases with

respect to antenatal visits, investigations and course of labour was undertaken to arrive at conclusions after satisfying the inclusion and exclusion criteria.

Inclusion criteria

1) Gestational age >28 weeks, fetal weight >500 grams.

2) Confirmation of iufd by usg by locating abscence of fetal cardiac activity

Exclusion criteria

1) Twins with one IUD

2) Cases with multiple etoiologies of IUD

Observation and Discussions

Table 1: Age wise distribution of cases

Age	Number (N=190)	Percentage
<20 yrs	23	12%
20-25 yrs	67	35%
26-30 yrs	71	38%
>30 yrs	29	15%
Total	190	100%

Maximum number of cases of intrauterine fetal death in our study was in the age group of 26-30 year (38%) This was followed by 35% in the age group 20-24 years. More number of cases in these age group could be due to maximum reproductibility in these age (Table 1).

Table 2: Distribution according to Gestational Age

Gestatational Age (in weeks)	No. of Preterm Labour(n=190)	Percentage in present study
28 to 34	44	23%
34 to 36	108	57%
>36	38	20%
Total	190	100%

Maximum number of intrauterine fetal death occurred at 34-36 weeks gestational age group which might be due to increased severity of aph, diabetes, and cord prolapse (Table 2).

Table 3: Distribution of cases as per Gravdity

Gravida	Number (N=190)	Percentage
1	48	25%
2	61	32%
3	38	20%
>=4	43	23%
Total	190	100%

There was no significant association between parity and occurrence of iufd (Table 3).

Table 4: Distribution of cases according to history of previous Still birth

Past obst. history	No. of cases	Percentage of present study
One still birth	38	20%
Two stillbirth	19	10%

Out of total 190 caeses of iufd only 30% had a history of previous stillbirth signifying a lower proportion of congenital anomaly as the cause of iufd (Table 4).

Table 5: Causes of stillbirth

Risk factors	No. of cases	Percentage in present study
Meconium aspiration	46	24%
APH	32	17%
Cord prolapse	11	6%
Congenital anomaly	11	6%
PET	10	5%
Unknown causes	80	42%
Total	190	100%

While 42% of cases of iufd had unknown causes this signifies a greater need to identify the various genetic and chromosomal causes not identified in routine antenatal workups. Amongst the known causes maximum toll is due to meconium aspiration syndrome, a largely preventable cause, often missed due to late and unregistered presentation in cases of oligohydraminios (Table 5).

Table 6: Distribution of cases according to Birth weight

	No. of cases (n=190)	Percentage
<1000	38	20%
1000-1500	78	4 1%

Maximum intrauterine fetal death occurred at fetal weight less than 2 kg probably implying that premature babies are more vulnerable to the effects of various causes of stillbirth (Table 6).

Table 7: Distribution of cases according to antenatal registration

Type of cases	No. of cases	Percentage of present study
Registered	70	37%
Unregistered	120	63%

Higher prpoportion of iufd in unregistered cases (63%) signify greater need for timely identification of various risk factors associated with iufd viz pih, anomalies, thyroid disorders etc. (Table 7).

Conclusion

The most significant finding of the study was higher occurence of iufd in unregistered cases calling for greater emphasis on encouraging antenatal visits and identification of high risk cases during these visits, a finding consistent with similar other studies [4].

Secondly vigilant monitoring of fetal heart rate patterns to identify distress and timely caesarean sections can reduce the second highest toll of meconium aspiration syndrome.

Antepartum haemorrhage and PET being the next major causes requires early identification and timely management.

Much cannot be done with regards to congenital anomalies kepping in view the costs involved in detecting them in view of poor socioeconomic conditions in our country.

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STATEMENT ABOUT OWNERSHIP AND OTHER PARTICULARS

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I **Dinesh Kashyap**, hereby declare that the particulars given above are true to the best of my knowledge and belief.

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Assessment of Chromohysteroscopy in Detection of Intracavitary Lesions in Perimenopausal Women with Abnormal Uterine Bleeding: A Prospective Study

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Abstract

Background and Aim: Abnormal Uterine Bleeding (AUB) is one of the most common health problems encountered by women. It affects about 20% women of reproductive age, and accounts for almost two thirds of all hysterectomies. Present study was done with an aim to To evaluate the role of chromohysteroscopy in detection of intracavitary lesions in perimenopausal women with abnormal uterine bleeding. *Material and Methods:* Present study was the prospective one in subjects of 95 perimenopausal women aged >42 years who presented with complaints of abnormal uterine bleeding. Following the necessary pre-operative preparation, all women underwent diagnostic hysteroscopy, chromohysteroscopy and targeted under suitable anaesthesia, fully assembled hysteroscope. A total of 32 cases in our study group underwent hysterectomy and specimens were sent for histopathology. Histopathological examination was carried out by a clinical pathologist who was blinded regarding hysteroscopic findings. Diagnostic accuracy of hysteroscopy and chromo hysteroscopy in detection of intracavitary lesions was then studied. *Results:* Mean age of the study group was 42.50 ± 3.89 years, average parity was 3 and mean BMI was 25.1 ± 3.45 Kg/m^2. Thirty nine percentage cases presented with menorrhagia, 36% with polymenorhagia, 8% with metrorrhagia and 5% with postmenopausal bleeding. A total of 32 cases in our study group underwent hysterectomy. In 20 of them intracavitary lesions were detected on hysteroscopy. In the rest cases, no intracavitary lesion was visualized on hysteroscopy. The diagnostic accuracy of chromohysteroscopy in detecting intracavitary lesions as unstained areas was also found to be significantly high. *Conclusion:* Thus it is concluded that the diagnostic accuracy of both hysteroscopy and chromohysteroscopy in detecting intracavitary made these lesions look more prominent and effortlessly identifiable to the observer, thereby minimizing inter-observer variations. A well outlined lesion is difficult to miss and less likely to involve conflicting diagnoses.

Keywords: Abnormal Uterine Bleeding; Chromohysteroscopy; Hysteroscopy; Intracavitary lesions.

Introduction

Abnormal Uterine Bleeding (AUB) is one of the most common health problems encountered by women. It affects about 20% women of reproductive age, and accounts for almost two thirds of all hysterectomies. Gynaecologists are often unable to identify the cause of abnormal bleeding even after a thorough history and physical examination. Diagnostic evaluations and treatment modalities

have been evolving over time. The onus in AUB management is to exclude complex endometrial hyperplasia and endometrial cancer. AUB has been traditionally investigated with blind procedures like dilatation and curettage or office endometrial biopsy, but now with changing trends towards minimally invasive investigations, diagnostic hysteroscopy with directed biopsy has become the gold standard [1] in the AUB workup. Hysteroscopy technique facilitates adequate visualization of uterine cavity, accurate detection of intracavitary lesions, less hospitalization, reduced disability and rapid return to normal activity [1]. Chromohysteroscopy is proposed to be one such novel chromoendoscopy technique. Hence, this study was undertaken to evaluate the role of chromohysteroscopy in detection of intracavitary lesions in perimenopausal women with abnormal uterine bleeding and to compare the hysteroscopic and chromohysteroscopic findings with the histopathologic diagnoses in these women.

Chromoendoscopy or tissues staining Techniques like chromohysteroscopy involve application of stains or pigments to improve localization, characterization, or diagnosis of lesions [2]. It enables endoscopists to formulate a diagnosis and to direct biopsies based on a specific reaction or enhancement of surface morphology. In recent years, there has been a resurgence of interest in this technique because it is a simple, safe, quick, widely available, and an inexpensive diagnostic tool that has been extensively used in gastro-endoscopy [3-5]. Methylene blue is a water-soluble vital stain that is actively taken up by absorbing tissues. Though unlike gastrointestinal mucosa, endometrium is not an absorptive epithelium, it has been reported that endometrium can be stained with methylene blue in all phases except in the peri-ovulatory phase [6]. The reason for endometrial staining has been explained with theory of apoptosis and it has been stated that the apoptotic structural damage allows passage of the methylene blue dye into the cell. Mucosal staining by methylene blue has been comprehensively studied in gastroenterology and it has been found to be a safe, inexpensive, reproducible, and a highly accurate method of diagnosing subtle mucosal changes [7]. Inspired from wide success of chromoendoscopy in the field of gastroenterology, possibility of application of vital stains to endometrium came to the mind of gynecologists and chromohysteroscopy technique came into existence.

Material Methods

Present study was the prospective one in subjects of 95 perimenopausal women aged >42 years who presented with complaints of abnormal uterine bleeding. The procedure was explained to the participants. Subjects who did not give informed consent and those with pelvic infection, pregnancy, carcinoma cervix, abnormal liver functions and coagulopathy were excluded. The study protocol was approved by the Institute's Ethics Committee. A comprehensive history was taken and a clinical examination was done in all subjects. All cases were subjected to transvaginal sonography.

Following the necessary pre-operative preparation, all women underwent diagnostic hysteroscopy, chromohysteroscopy and targeted under suitable anaesthesia, fully assembled hysteroscope. Adequate focusing of the image was done prior to insertion of the hysteroscope which was advanced slowly into the uterine cavity under direct vision.

The cervical canal was visualized in its totality. Once the junction between cervix and uterus was crossed, the uterine cavity was first observed panoramically and then, bilateral tubal Ostia were inspected. Following this, all portions of uterine wall fundus, anterior wall, left lateral wall, posterior wall and right lateral wall were systematically inspected. Slight rotation of the hysteroscope was needed to observe the utero-tubal regions, aided by its inbuilt fore-oblique view. The hysteroscopic findings were recorded and any abnormal areas if detected were noted. This was followed by chromohysteroscopy. 5 ml of 1% methylene blue was introduced through the hysteroscopic inlet. After 3 minutes distending medium flow was started again to wash the endometrium and the uterine cavity was then visualized for staining pattern. First the staining pattern over the intracavitary lesion (if present) was noted and then the adjacent endometrial staining patterns were studied. In cases without cavity lesions differential staining pattern of the endometrium was directly studied. Different patterns of staining observed were: homogenous light blue staining, dark blue staining, partial staining and unstained areas. Diffuse light blue staining was considered normal. Partial staining, dark blue staining or unstained areas above the internal cervical ostium regardless of size and number of stained areas were considered positive findings. These findings were compared with the diagnostic hysteroscopy findings. All the endometrial biopsy specimens were examined by the same pathologist who was blinded about the hysteroscopic findings. The hysteroscopic and chromohysteroscopy findings were then compared with the histopathology results and the diagnostic accuracy of both the techniques were calculated.

Statistical analysis

The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using SPSS version 15 (SPSS Inc. Chicago, IL, USA) Windows software program. The variables were assessed for normality using the Kolmogorov-Smirnov test. Descriptive statistics were calculated.

Results

Mean age of the study group was 42.50 ± 3.89 years, average parity was 3 and mean BMI was 25.1 ± 3.45 Kg/m2. Thirty nine percentage cases presented with menorrhagia, 36% with polymenorhagia, 8% with metrorrhagia and 5% with postmenopausal bleeding. Conventional hysteroscopy revealed normal cavity in 56 cases, intracavitary lesions were detected in 24 cases and synechiae in 2 cases, diffuse endometrial disease was suspected in 15 cases.

On chromohysteroscopy, most of the intracavitary lesions (70%) either did not stain or the uptake was very minimal giving an unstained appearance in comparison to the surrounding endometrium. The lesions thus got demarcated and separated from the surrounding endometrium and this facilitated their easy and quick detection.

A total of 32 cases in our study group underwent hysterectomy. In 20 of them intracavitary lesions were detected on hysteroscopy. In the rest cases, no intracavitary lesion was visualized on hysteroscopy (Table 1).

The conventional hysteroscopic, chromo hysteroscopic and histopathologic findings were then compared with each other and diagnostic accuracy of both the techniques was computed. The diagnostic accuracy of conventional hysteroscopy in detecting polyps was found to be high (Sensitivity-86.11%, specificity- 91.98%, positive predictive value- 76.1%, negative predictive value- 95.23%, $p \leq 0.05$). Its diagnostic accuracy in detecting submucous fibroids was also high The diagnostic accuracy of chromohysteroscopy in detecting intracavitary lesions as unstained areas was also found to be significantly high (Sensitivity- 81.1%, specificity- 79.10%, positive predictive value- 83.9%, negative predictive value- 72.90%; $p \leq 0.05$.)

Table 1: Histopathology Findings of Hysterectomy Specimens

Findings	Number (%)
Endometrial polyps	7 (21.8)
Sub mucosal leiomyoma	12 (37.5)
Myohyperplasia	6 (18.75)
Sub mucosal leiomyoma with degeneration	1 (3.1)
Intramural leiomyoma	6 (18.75)
Total	32 (100)

Discussion

Present study was performed to evaluate the role of chromohysteroscopy in detection of intracavitary lesions in perimenopausal women with abnormal uterine bleeding. The diagnostic accuracy of conventional hysteroscopy in detecting both polyps and submucosal fibroids is significantly high These findings are in accordance with a study by Angioni S et al. [8] in which hysteroscopy demonstrated a sensitivity of 100% and a specificity of 97%, with an accuracy of 91% in diagnosing endometrial polyps, a sensitivity and specificity of 100% and 98%, respectively, with an accuracy of 99% for submucous myomas. Chromohysteroscopy was done in all and it was found that the endometrium in majority cases, intracavitary lesions either did not stain or the uptake was very minimal giving an unstained appearance in comparison to homogenous staining of the surrounding endometrium. This resulted in better demarcation of these lesions which got separated from the surrounding endometrium and this facilitated their easy and quick detection.

In future, this feature may become useful in operative hysteroscopy as a well demarcated lesion will be technically much easier to approach and operate for the surgeon. In various studies [9-11] on chromohysteroscopy, cavities with intracavitary lesions were excluded from the study and staining was not done in them. Further, those cavities in which endometrium did stain were also not sampled. No study, in the reviewed literature, therefore has till date compared the histopathology findings with unstained areas found on chromohysteroscopy The diagnostic accuracy of chromohysteroscopy in detecting intracavitary lesions as unstained areas was found to be significant in our study.

Conclusion

Thus it is concluded that the diagnostic accuracy of both hysteroscopy and chromohysteroscopy in detecting intracavitary made these lesions look more prominent and effortlessly identifiable to the observer, thereby minimizing inter-observer variations. A well outlined lesion is difficult to miss and less likely to involve conflicting diagnoses. Inter-observer variations will decrease

with chromohysteroscopy and it is thus a useful cost-effective adjunct to hysteroscopy.

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Comparative Study of Efficacy of Head Cap Versus Calcium Supplementation in Preventing Phototherapy Induced Hypocalcemia in Neonates

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Abstract

Context: Phototherapy treatment for hyperbilirubinemia in neonates may result in development of hypocalcaemia. The study is done to assess role of calcium prophylaxis and head cap in the prevention of phototherapy induced hypocalcemia. *Aims:* To compare the efficacy of head cap versus calcium supplementation in preventing phototherapy induced hypocalcemia. *Settings and Design:* Prospective study undertaken in NICU at JSS Hospital, Mysuru from January 2013 to June 2014. *Methods and Material:* This study was conducted on 150 full term neonates (50 in each group: Group A - only phototherapy, Group B - phototherapy receiving oral calcium prophylaxis, Group C - phototherapy with head cap). Serum ionized calcium levels were measured before and after phototherapy. *Statistical analysis used:* Statistical analysis done by SPSS software 19.0 version. *Results:* In control group (Group A), 28 (58.3%) neonates showed decrease in serum ionized calcium levels following phototherapy out of which, 11 (22.9%) developed hypocalcemia. Mean serum ionized calcium levels before phototherapy was 1.193 mmol/L and after phototherapy 1.06 mmol/L. In group Group B, 27 (56.3%) showed a decrease in serum ionized calcium levels following phototherapy of which, three (6.3%) developed hypocalcemia. The mean serum ionized calcium levels before phototherapy was 1.219 mmol/L and after phototherapy 1.172 mmol/L. In Group C, 30 (62.5%) neonates showed a decrease in serum ionized calcium levels following phototherapy of which, nine (18.8%) developed hypocalcemia. Mean serum ionized calcium levels before phototherapy was 1.25 mmol/L and after phototherapy, it was 1.14 mmol/L. None of the neonates in all group who showed a drop in serum ionized calcium levels below one mmol/L developed any signs of hypocalcemia. *Conclusions:* Neonates under phototherapy can develop hypocalcemia as a complication. Oral calcium supplementation to neonates under phototherapy would be beneficial in preventing phototherapy induced hypocalcemia.

Keywords: Hyperbilirubinemia; Phototherapy; Ionized Calcium; Hypocalcemia; Head Cap.

Introduction

Phototherapy is a safe and effective modality of treatment for neonatal hyperbilirubinemia. Adverse effects include loose stools, hyperthermia, dehydration fluid loss, skin burn, photoretinitis, low platelet count, increased red cell osmotic fragility, bronze baby syndrome, riboflavin deficiency and DNA damage [1]. A lesser known side effect, but potential complication of phototherapy is hypocalcemia [2].

There are few studies on hypocalcemic effect

of phototherapy with controversial results and even fewer studies on the role of calcium therapy and head cap in the prevention of phototherapy induced hypocalcemia, hence this study was done.

Materials and Methods

After obtaining ethical clearance from the institution, this comparative prospective study was undertaken in NICU at JSS Hospital, Mysuru from January 2013 to June 2014. Full term neonates weighing more than 2.5 kgs with unconjugated hyperbilirubinemia requiring phototherapy were included. Neonates who were preterm, post-term, with jaundice in first 24 hours of life, infant born to diabetic mother, with birth asphyxia, mother on anti-convulsants, with previous exchange transfusion, septic were excluded. After written informed consent, 150 full term neonates with unconjugated hyperbilirubinemia requiring phototherapy were included in the study. Six neonates had hypocalcemia before starting phototherapy and were not continued in the study. 144 children continued in the study and they were consecutively allotted into the following three categories with each group comprising of 48 neonates. Neonates in Group A were subjected to phototherapy only. Neonates in Group B were supplemented with oral calcium (with cardiac monitoring) during phototherapy. Neonates in Group C were provided with cotton caps covering their head and occiput during phototherapy. Serum ionized calcium levels measured before and at 48 hours of phototherapy or at the end of phototherapy in case the duration of phototherapy was less than 48 hours. All neonates were subjected to double surface phototherapy which was based on the american academy of pediatrics subcommittee 2004 guidelines for management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. All statistical measurements are done using SPSS software 19.0 version. The following statistical methods were employed in the present study. Chi-square test, contingency table analysis, one-way ANOVA, and 't' test - independent samples.

Results

The mean gestational age was 38.5 wks, 38.60 wks, 38.51 wks in group A, B and C respectively. There were 29 males and 19 females in group A, 26 males and 22 females in group B and 25 male and 23 female in group C. Mean serum bilirubin was 20.16, 19.86 and 19.18 mg/dl in group A, B and C respectively before phototherapy and mean duration of phototherapy was 34.58 hrs, 35.83 hrs and 36.5 hrs in group A, B and C as shown in table 1. The mean serum ionic calcium level was 1.193, 1.219 and 1.25 mmol/l before initiation of phototherapy in group A, B and C and following phototherapy fall in mean serum ionic calcium was 0.132, 0.046 and 0.093 mmol/l respectively which was statistically significant. Eleven neonates in group A, three neonates in group B and nine neonates in group C developed hypocalcemia following phototherapy but none of the neonates developed signs and symptoms of hypocalcemia. The fall in serum ionic calcium was statistically significant as shown in table 2.

Table 1: Results of mean gestational age, mean serum bilirubin, mean weight and mean duration of phototherapy in three groups.

Groups	Mean Gestational Age	Mean Serum Bilirubin	Mean Weight	Mean Hours of Phototherapy
Control	38.51 ± 1.10	20.16 ± 2.3	2.99 ± 0.25 kg	34.58 ± 9.1
Calcium supplementation	38.66 ± 1.14	19.86 ± 2.6	2.85 ± 0.24kg	35.83 ± 9.0
Head cap	38.51 ± 1.00	19.18 ± 3.3	2.81 ± 0.23kg	36.50 ± 8.9

Table 2: Mean serum ionized calcium before and after phototherapy.

Groups	Mean calcium before PT*	Mean calcium after PT	Mean fall in calcium after PT	P value	No of Hypocalcemia
Control	1.193±0.093	1.06±0.30	0.132	0.002	11
Calcium supplementation	1.219±0.098	1.172±0.153	0.046	0.048	3
Head cap	1.250±0.09	1.14±0.24	0.093	0.001	9

*PT - Phototherapy

Discussion

Neonatal hypocalcemia is defined as ionized calcium less than less than 4.8 mg/dL (1.2 mmol/L ionic) in term neonates [3]. Phototherapy is not without potential adverse effects, one of them being hypocalcemia. Hypocalcaemia has been reported as a reaction to phototherapy in premature and full-term newborns [4,5].

In the present study, mean serum ionized calcium levels in the control group before phototherapy was 1.193 ± 0.106 mmol/L and after phototherapy it was 1.06 ± 0.30 mmol/L (p=0.002). This is comparable to the one study [1] where the mean serum ionized calcium levels in neonates under phototherapy was 1.196 ± 0.0548 before and 0.98 ± 0.1426 after phototherapy (p<0.005) which is statistically significant. Similar observations were documented by one study [6], in which 60 neonates were subjected to phototherapy and a significant fall in both total and serum ionized calcium levels was observed in 90% following phototherapy. There is large variations in the incidence of hypocalcemia following phototherapy in different studies [1,5,6,7] ranging from 7 to 66%, however in present study 11 out of 48 neonates in control group (22.9%) developed hypocalcemia.

In group B who were provided with oral calcium supplementation during the course of phototherapy, only three (6.3%) developed hypocalcemia but none of these neonates were symptomatic which is similar to two studies [8,9] where as other studies [10] showed features of hypocalcemia in the form of irritability and jitteriness. Our study shows that supplementation of oral calcium during phototherapy reduces incidence of hypocalcemia similar to other studies [6,10].

In group C, nine out of 48 (18.8%) neonates with protective head cap during phototherapy developed hypocalcemia and none were symptomatic which is consistent with the two studies [7,8]. Though two studies have shown that covering the head of the neonate during phototherapy can prevent hypocalcemia [5,10], the present study did not show similar results.

The duration of phototherapy in present study was 48 hrs similar to other studies [1,8,9]. In the present study serum ionized calcium levels were measured before and after stopping phototherapy where as other studies [4,7,10] study serum calcium levels were measured after 24 hours or 48 hrs of discontinuation of phototherapy. There was no correlation between hypocalcemia and serum bilirubin level similar to the observation made by other study [7]. Several studies have suggested the use of calcium prophylaxis and head cap in the prevention of phototherapy induced hypocalcemia [4,6,9,10]. The limitation of the study was allocation of neonates into groups was done consecutively. The strength of the study was serum ionic calcium was measured rather than serum calcium levels.

Conclusion

Oral calcium supplementation during phototherapy reduces chances of developing phototherapy induced hypocalcemia as compared to those neonates who were protected with head cap during phototherapy. Hypocalcemia can occur as a complication following phototherapy in neonates.

Key Messages

Neonates under phototherapy can develop hypocalcemia as a complication following phototherapy. Oral calcium supplementation to neonates under phototherapy would be beneficial in preventing phototherapy induced hypocalcemia.

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Red Cell Distribution Width to Platelet Ratio (RPR) - A Predictive Index of Ductal Closure in Preterm Neonates

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Abstract

Introduction: Inflammatory processes have been proposed to have a role in maintaining the patency of Ductus Arteriosus. Red cell distribution width (RDW) levels escalate in the presence of inflammation. Our aim was to evaluate the role of red cell distribution width to platelet ratio (RPR) in predicting the closure of hemodynamically significant patent ductus arteriosus (hsPDA) in response to paracetamol therapy in preterm neonates. *Methods:* A prospective comparative study was conducted on preterm neonates less than 37 weeks of gestation diagnosed with hsPDA after obtaining Institutional ethical clearance and detailed informed consent from the parents. All the neonates were treated with oral paracetamol for 3 days and then reassessed for closure of PDA. RDW and platelet counts were analyzed within 24 hours of life and RPR was then calculated. Preterms with sepsis, anemia, asphyxia, major congenital malformations were excluded from the study. *Results:* 108 preterm neonates were admitted to the NICU during the study period, of which 50 neonates were included in the study. Ductus closed in 28 preterms following treatment by day 3. Mean RPR was found to be lower in the neonates in which the ductus closed by day 3. An RPR cut off of 0.12 having AUC of 0.769 had sensitivity of 68% and specificity of 86% with PPV and NPV of 79% and 77% respectively for the prediction of Ductus Arteriosus closure. *Conclusion:* Our study shows that RPR can be used as a simple and effective screening tool in foreseeing the successful closure of hsPDA with pharmacotherapy.

Keywords: Ductus Arteriosus; Ductal patency; Paracetamol; Inflammation.

Introduction

The incidence of Patent Ductus Arteriosus (PDA) in preterm neonates weighing less than 1750 grams ranges from 15% to 37% as compared to 2/1000 in term newborns [1]. Ductus Arteriosus patency has been associated with higher rates of serious morbidities such as intraventricular hemorrhage, respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary hemorrhage and mortality [2]. It has been hypothesized that inflammatory processes may have a role in maintaining the patency of ductus arteriosus, as its incidence rises in the presence of chorioamnionitis and sepsis [3]. Red cell distribution width (RDW) which is part of a standard complete blood count, has been identified to have a critical role in various inflammatory diseases in adults [4].

There is a need to identify alternate tools for early prediction of PDA and its response to therapy. Red cell distribution width to Platelet ratio (RPR) is an easily calculated parameter and is noted to have high

predictive value in adult inflammatory diseases [5]. In our study we aim to establish the role of RPR in predicting the closure of hemodynamically significant PDA (hsPDA) by day 3 of life in preterm neonates on Paracetamol therapy.

Materials and Methods

A prospective comparative study was conducted on all the preterm babies admitted to a tertiary care neonatal intensive care unitover a period of one year between October 2017 and October 2018. All preterm neonates with gestational age less than 37 weeks according to Ballard's scoring and diagnosed with hsPDA on echocardiogram within the first 24 hours of life were included in this study after obtaining the Institutional ethical clearance and a detailed informed consent from the parents. Preterms with major congenital malformations and any babies who died within 48 hours were excluded. Syndromes known to be associated with PDA or thrombocytopenia, those who underwent transfusion or were diagnosed with sepsis, anemia and asphyxia were also excluded. Demographic data collected from all the neonates included gender, birth weight and gestational age. Two ml of peripheral venous blood sample was collected in an EDTA vacutainer within the first 24 hours of life and processed in Sysmex XN-1000 Hematology Analyzer to obtain a complete hemogram which included a platelet count along with red cell distribution width. RPR was then calculated from the values obtained in the following manner.

$$\text{RDW: Platelet Ratio (RPR)} = \frac{\text{Red cell Distribution Width (\%)}}{\text{Platelet count } (10^9/\text{L})}$$

All the preterms included in this study underwent echocardiography by an experienced Pediatric Cardiologist using M-Turbo system with SonoADAPT, SonoHD, and SonoMB technology (2007-2013 FUJIFILM SonoSite, Inc). The size of the PDA, the gradient across the shunt and the severity of associated pulmonary artery hypertension was noted. hsPDA was defined as presence of ductal diameter >1.5 mm. The clinical symptoms, oxygen and ventilator requirement were also recorded. All the neonates were then treated with oral paracetamol at a dose of 15 mg/kg/dose every 6 hours for 3 days. Following which, they were reassessed for closure of ductus arteriosus.

Statistical analysis was done using SPSS Inc released 2008 (SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc). Mean and standard deviation were calculated for the demographic and hematological parameters. Chi square test was used to compare means of categorical variables and independent t test for continuous variables. P value of <0.05 was considered significant. ROC curve was generated and the area under curve (AUC) was calculated to see the predictive value of RPR in closure of Ductus Arteriosus. Sensitivity, specificity, positive predictive value (PPV) and negative predictive values (NPV) were also analyzed.

Results

108 preterm neonates were admitted to the NICU during the study period, of which 60 neonates were eligible for the study. 10 neonates were excluded from the study due to congenital malformations and sepsis. Rest of the 50 neonates with hsPDA were included in the study. Ductus closed in 28 preterms following treatment by day 3 while it remained open either at the same size or smaller in the rest. Depending on the closure of PDA on Day 3 neonates were grouped. Group A comprised of neonates whose PDA closed by Day 3 and Group B comprised of neonates whose PDA remained open on Day 3. Demographic and clinical features of the patients have been compared in Table 1. There was no statistically significant difference between the two groups with respect to the demographic parameters. However, it was seen that respiratory distress and oxygen requirement was higher in group B with no significant difference seen in CPAP and ventilatory requirements between the two groups.

The Echocardiographic parameters of the PDA were analyzed in both the groups (Table 2). It was observed that, the size of PDA and the incidence of PAH was higher in group B and the PDA gradient was higher in Group A. Hematological parameters collected were compared, which showed there was a significant difference in platelet as well as RDW individually; Platelet being lower in Group B and RDW being higher in Group B (p value 0.001) and the calculated RPR being higher in Group B (p value <0.001) (Table 3).

ROC curve (Fig. 1) was plotted to find out the usefulness of RPR in predicting the closure of ductus arteriosus by day 3 of life. Results of which have been depicted in Table 4.

Table 1: Demographic and clinical parameters

Demographic/Clinical parameter	Group A	Group B	p value
Gestational Age (weeks)	31.9 (2.4)	32.6 (1.9)	0.25
SGA % (n)	35.7 (10)	45.4 (10)	
AGA % (n)	64.3 (18)	54.5 (12)	
Birth weight (kg)	1.97 (0.6)	1.84 (0.3)	0.43
Sex			
Male % (n)	60.7 (17)	45.4 (10)	0.28
Female % (n)	39.2 (11)	54.5 (12)	
Tachycardia			
Yes	10.7 (3)	27.3 (6)	0.13
No	89.3 (25)	72.7 (16)	
Respiratory distress			
Yes	53.6 (15)	81.8 (18)	0.03
No	46.4 (13)	18.2 (4)	
Oxygen requirement			
Yes	64.3 (18)	90.9 (20)	0.02
No	35.7 (10)	9.1 (2)	
*CPAP**			
Yes	42.9 (12)	59.3 (13)	0.25
No	57.1 (16)	40.9 (9)	
Ventilation requirement			
Yes	3.6 (1)	9.1 (2)	0.42
No	96.4 (27)	90.9 (20)	

*Continuous positive airway pressure Mean (SD)

Table 2: Echocardiographic parameters of the PDA

PDA parameter	Group A	Group B	p value
Size of PDA (mm)	2.12 (1)	3.91 (0.7)	< 0.001
Gradient (mm of Hg)	23.2 (8.1)	16.3 (4.8)	< 0.001
PAH#			
Yes % (n)	46.4 (13)	100 (22)	<0.001
No % (n)	53.6 (15)	0	

#pulmonary arterial hypertension Mean (SD)

Table 3: Hematological parameters influencing PDA Closure

Hematological investigation	Group A Ductus closed	Group B Ductus open	p value
Hemoglobin (g/dl)	18.3 (1.6)	17.5 (2.2)	0.16
Total count (cells/mm3)	12.3 (0.4)	15.1 (0.9)	0.18
Platelet (lakh cells/mm3)	2.1 (0.5)	1.3 (0.6)	0.001
RDW$ (%)	14.8 (1.9)	17.7 (3.4)	0.001
RPR‡	0.076 (0.027)	0.141 (0.06)	< 0.001

$Red cell distribution width, ‡Red cell distribution width to platelet ratio Mean (SD)

Table 4: Cut off level, Specificity, Sensitivity and NPV of RPR

	Cut Off Level	Specificity (%)	Sensitivity (%)	PPV**(%)	NPV## (%)
RPR^	0.12	85.7	68.2	78.9	77.4

^Red cell distribution width to platelet ratio, **Positive predictive value, ##Negative predictive value

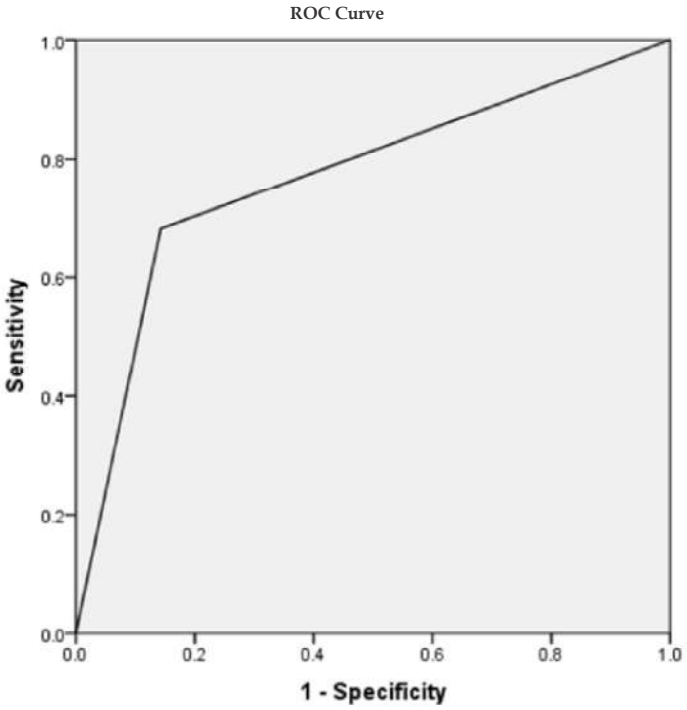

Fig 1: ROC Curve of RPR showing Area under the Curve (AUC)

Discussion

PDA is a tricky clinical condition and the daily clinical debate on when and how to treat it in preterm neonates continues. It is imperative to distinguish between a hemodynamically significant and non significant PDA, before the decision to treat is taken [6]. Birth weight and gestational age are established parameters which predict closure of PDA as shown in multiple studies [7,8]. According to Benitz and committee on Fetus and Newborn, PDA would persist in around 10% infants with gestational age between 30 and 37 weeks on day 4 of life [9]. However, in our study the mean gestational age and birth weight in both the groups were statistically insignificant.

In a study done by Sung et al. on preterms with an average gestational age ranging between 24.5 - 24.6 weeks, it was observed that there was no effect of the ductal size on the time of closure of the PDA. This is comparable to the results of a retrospective study done in 2008 by Yang et al. on 139 extremely low birth weight infants with mean ductal diameter of 2.0 ± 0.7 mm. Although all the infants included in our study had hemodynamically significant PDA, the group which remained open on day 3 had a larger mean size of the duct on day 1 as compared to the one which closed by day 3 [10,11].

Christensen et al. in a study done in 2014, identified that the RDW reference interval ranged between 15.5–20% at birth for term as well as late preterm neonates [12]. Values as high as 23% constituted the upper limit for preterm neonates in their study and they showed that RDW decreases with increase in gestational age [12,13]. A recent study done by Garofoli et al stated that in preterm neonates with a mean gestational age of 30.56 weeks, a mean RDW of 17.7% was noted during the first three days of life and this was significantly higher than their healthy full term counterparts. This can probably be explained as all preterms including those with PDA, sepsis and asphyxia were involved in their study [14]. Hence neonates with sepsis and perinatal asphyxia were excluded from our study as RDW levels are known to be increased in these conditions due to the effect of proinflammatory cytokines on red cell production [15]. Similarly, preterm neonates with anemia and platelet transfusions were excluded from the study as they alter the RDW and platelet levels [13].

An elevated RDW has been reported to be associated with mortality and other severe adverse outcomes in adults [16]. Several studies conducted in adults have demonstrated a strong association between elevated RDW levels and inflammation [17]. However, there is limited data suggesting a similar relationship in critically ill neonates. General sterile inflammation was thought to play a part in PDA pathogenesis [18]. Furthermore, it has been observed that the incidence of Ductus Arteriosus patency rises in the presence of sepsis

and chorioamnionitis. It has been suggested that the likely mechanism involved in the maintenance of the ductal patency, is an inflammatory process which stimulates the release of Prostaglandin E2 and Prostacyclin [3]. This correlates with the findings in our study, that a higher RDW levels, with a mean of 17.7% is associated with delayed closure of the PDA. This is in contrast to the study done by Ozer et al who put forth that the RDW values were similar in open and closed PDA groups, i.e. 15.75 and 16.85 respectively [18].

RPR is a novel index that is routinely available, inexpensive and can be easily calculated from the available hematological parameters such as platelets and RDW [19]. The role of RPR in predicting the inflammatory process in adult cardiac and liver diseases have been studied extensively in adults, however no such studies have been done in neonates [19-21]. The only other study which has identified the role of RDW to Platelet ratio in the diagnosis and follow up of PDA has been done by Özer et al. and published in June 2018. Özer et al. in their study observed that an RPR cut off of 0.13, had a specificity of 92% and a sensitivity of 61% in differentiating hsPDA from non hsPDA. They also derived that an RPR cut off 0.15, had a specificity of 90% and a sensitivity of 71% in differentiating non-responders from responders. However, in our study, where only hsPDA were included, it was observed that a lower RPR cut off of 0.12 had the highest specificity of 85.7% and sensitivity of 68.2% which was comparable with their results [18].

To the best of our knowledge, this is the first prospective study analyzing the role of RPR in determining the closure of hemodynamically significant PDA in preterm neonates within 3 days of life with paracetamol therapy. The application of this index may aid in deciding the need of pharmacotherapy in the closure of hemodynamically significant PDA and avoid unnecessary medical therapy in preterm neonates with PDA.

Limitations of the study were that the sample size included was small. We considered only trans ductal diameter on echocardiogram to diagnose hsPDA. Other parameters like ductal velocity or left atrial/ aortic root width ratio in combination with ductal diameter would have increased the strength of the study.

Conclusion

This study illustrates that RPR can be used as a unique screening tool in predicting the closure of hsPDA by Day 3 of treatment in preterm neonates admitted in resource limited settings without any additional expense. The additional advantage being that it can aid the attending pediatrician in decision making regarding the requirement of pharmacological treatment of the PDA. However further studies in large scale populations may be needed to firmly establish the role RPR in preterm neonates.

What This Study Adds

Ratio of red cell distribution width (RDW) to platelet ratio (RPR) successfully predicts which hsPDA will close in next 72 hours with paracetamol therapy. RPR cut off of 0.12 had the highest specificity of 85.7% and sensitivity of 68.2%.

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Study on Prevalence and Risk Factors for Persistent Pulmonary Hypertension in Ventilated Term Newborns in a Tertiary Care Neonatal Unit

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Abstract

Context: Persistent pulmonary hypertension (PPHN) is a serious neonatal illness, with significant morbidity and mortality. Limited data are available about PPHN in our set up and thus this study was done. *Aims:* To assess the prevalence and risk factors of PPHN in ventilated term neonates. *Settings and Design:* Prospective observational study conducted at NICU, JSS medical hospital, Mysuru from January 2015 to January 2016. *Methods and Material:* All ventilated term babies were diagnosed PPHN, provided they had right to left or bidirectional hemodynamic shunting at the ductus arteriosus or at patent foramen ovale along with tricuspid regurgitation jet >35 mm of Hg on echocardiography. The demographic, maternal, antenatal, natal and postnatal data were recorded on a predesigned proforma. *Statistical analysis used:* Student T test and Chi square were used to find the association between qualitative variables. *Results:* Out of 72 ventilated babies enrolled, 48 (66.7%) babies developed PPHN. Meconium aspiration syndrome, birth asphyxia, septicemia, polycythemia, metabolic acidosis, cesarean section, maternal gestational diabetes mellitus were associated with an elevated risk for PPHN. *Conclusions:* PPHN is a serious condition frequently encountered in ventilated term neonates . The prevalence of PPHN can be reduced by providing good antenatal care, regular follow up of high risk pregnancy, efficient resuscitative measures at the time of birth.

Keywords: Persistent pulmonary hypertension; Neonates; Risk factors.

Introduction

Persistent pulmonary hypertension of the newborn (PPHN) is associated with significant neonatal morbidity and mortality. Despite the introduction of treatment with drugs like sildenafil, prostacyclin, nitric oxide, advanced modes of mechanical ventilation and extracorporeal membrane oxygenation about 4 to 33% of the affected infants still die and those who survive may suffer from serious and long term sequelaes like chronic lung disease, seizures and neurodevelopmental problems [1,2].

PPHN is a disease of serious nature with increased mortality and its risk factors like birth asphyxia, meconium aspiration syndrome (MAS) and sepsis are quite frequent in our setups. Limited data are available about PPHN, thus aim of this study was to see the prevalence of PPHN and its risk factors.

Materials and Methods

After obtaining institutional ethical clearance, this prospective observational study was conducted at NICU, J.S.S. Hospital, Mysuru from January 2015 to

January 2016. All ventilated term neonates admitted in NICU were enrolled for the study after obtaining a valid written consent from parents. The sample size was estimated to be 70 ventilated term neonates. Sample size was calculated using Reosoft Software 2004 by Raosoft, Inc assuming the prevalence of 5%, with level of confidence as 95% and margin of error as 5%. Exclusion criteria included, ventilated babies with evidence of any congenital cardiothoracic abnormality except for patent ductus arteriosus, patent foramen ovale or a single, small, muscular ventriculo septal defects. (Neonates with an ASD were included because right to left atrial hemodynamic shunting commonly occurs among infants with PPHN and in describing this finding, neonatal echocardiographic (ECHO) studies sometimes do not distinguish between ASD and patent foramen ovale. Neonates who had an isolated small muscular ventriculoseptal defect or small PDA defect were included because it is a common and hemodynamically insignificant abnormality). All neonates included in the study were subjected to baseline laboratory investigations including a complete blood count, arterial blood gases, blood glucose, serum electrolytes, chest x-ray and blood culture. All Neonates were monitored with continuous pulse oximeter, blood pressure and ECHO. 2D ECHO and colour doppler study were performed to exclude structural congenital heart disease and to assess pulmonary arterial hypertension by estimating pressures according to protocol. Statistical analysis was done using Ms Excel 2016 and analyse- it v4.65.2. All qualitative variables were expressed as proportions with confidence intervals and quantitative variables are expressed as mean ± SD. Comparisons of means were done using student T test. Chi square were used to find the association between qualitative variables.

All ventilated babies who were admitted with gestational age >37 weeks (defined from their mother's last menstrual period or antenatal scans, if not available then as per Ballard scoring system) were selected for ECHO, performed by an experienced pediatric cardiologist using phased array, pediatric probe and frequency of 7mega Hz. Among those who underwent 2D ECHO, neonates were designated as having PPHN who met the following two criteria.

1. Right- to- left or bidirectional hemodynamic shunting at the ductus arteriosus or at patent foramen ovale accompanied by leftward bowing of the ventricular septum to a degree consistent with pulmonary arterial pressure more than half of the systemic pressure.

2. Tricuspid regurgitation jet pressure of >35 mm of Hg.

There are a number of ECHO indicators that help indirectly to measure pulmonary artery pressure (PAP). We chose peak velocity of the tricuspid regurgitation (TR) jet of more than 35 mm of Hg as one of our selection criteria. TR jet pressure is an indicator of the right ventricular systolic pressure which is equivalent to pulmonary artery systolic pressure after adding right atrial pressure provided that there is no pulmonary valvular obstruction as well [3]. The right atrial (RA) pressure is generally assumed to be 5-10 mm of Hg in infants. PAP = TR + RA pressure

Results

Out of 72 cases enrolled in our study, 48 (66.7%) developed PPHN and 24 (33.3%) were normal. Out of 48 PPHN babies, 29 (60.4%) were male and 19(39.6%) female which was statistically not significant. Out of 48 cases of PPHN, 33 (68.7%) were referred from outside hospitals, 27 (56.25%) were delievered via cesarean section, 38 (79.16%) were born via meconium stained amniotic fluid and 30 (62.5%) were born to primigravida. Nine newborns out of the total 72 had mothers who were on aspirin therapy. Out of 72 neonates enrolled, 38 had MAS and 27 (71.1%) of MAS babies developed PPHN and 27% cases of birth asphyxia had associated PPHN. Out of 48 PPHN cases, 46 (95.8%) had metabolic acidosis and 34 (70.8%) of PPHN cases had polycythemia.

Table 1: General Characteristics of Neonates

Groups	PPHN# Present (%)	PPHN Absent (%)	No of Neonates
Gender Male	29 (64.4)	16 (35.6)	45
Gender Female	19 (70.4)	8 (29.6)	27
Outborn	33 (64.7)	18 (35.3)	51
Inborn	15 (71.4)	6 (28.6)	21
Vaginal	21 (70)	9 (30)	30
LSCS*	27 (64.3)	15 (35.7)	42
Primigravida	30 (68.2)	14 (31.8)	44
Multigravida	18 (64.3)	10 (35.7)	28

#Persistent Pulmonary Hypertension * Lower Segment Cesarean Section

Table 2: Association of PPHN* with risk factors.

		PPHN Present (%)	PPHN Absent (%)	Noof Neonates	p value
MAS#	Present	27 (71.1)	11 (28.9)	38	0.4
	Absent	21 (61.8)	13 (38.2)	34	
Polycythemia	Present	34 (75.6)	11 (24.4)	45	0.03
	Absent	14 (51.9)	13 (48.1)	27	
Metabolic acidosis	Present	46 (82.1)	10 (17.9)	56	0
	Absent	2 (12.5)	14 (87.5)	16	

Meconium aspiration syndrome * Persistent pulmonary hypertension

Discussion

The diagnosis of PPHN depends on high clinical suspicion, ECHO, pulse oximetry and blood gas analysis. In our study prevalence of PPHN in term ventilated newborns was 66.7%, while it varied from 5% to 19% in other studies [4,5]. The most common condition associated with PPHN in this study was meconium aspiration syndrome (MAS) representing 71.1% of PPHN while other studies [5,6] reported 35 to 50% association. Meconium causes mechanical obstruction to the airways, resulting in air trapping, hyperinflation, and increased risk for pneumothorax.

The second common condition associated with PPHN in this study was birth asphyxia which was present in 27% of the total PPHN babies, while in other studies [5,6] association of 40 to 43.75% was reported. Any in utero or perinatal insult that causes fetal or neonatal hypoxia will also increase the likelihood of PPHN [7]. Less frequently associated conditions with PPHN were pneumonia and sepsis (2%).

In the present study, out of 48 neonates with PPHN, 29(60.4%) were male and 19 (39.6%) were female similar to other study [8] where male are more affected. In our study 30 (62.5%) PPHN neonates were born to primigravida mothers, whereas 18 (37.5%) neonates were born to multigravida similar to one study [4]. Out of 48 PPHN neonates, 15 (31%) babies were inborn and 33 (69%) babies were outborn (Table 1). This may reflect that lack of proper antenatal, perinatal, post natal care including proper resuscitation methods and proper transportation system in the rural areas of our country may be contributing factors for development of PPHN and good antenatal and post natal care may help to reduce the prevalence of PPHN.

In this study, 27 (64.3%) neonates with PPHN were delivered by cesarean section similar to other studies [5,6]. Cesarean section without the prior labor seems to pose the single greatest risk for a newborn infant to have PPHN [7]. It is a well-known fact that neonates with fetal distress during intrapartum period had increased chance of passing meconium in utero and developing MAS and PPHN. A particularly high risk of PPHN has been observed when cesarean sections were performed before 39 weeks of gestation.

Nine mothers had history of taking aspirin during gestational period and babies born to seven (78%) out of these nine mothers had PPHN. Even though it is statistically not significant (due to small sample size), it is an important finding of our study. Out of 72 neonates, two mothers had gestational diabetes mellitus, babies born to both the mothers had PPHN.

Out of 48 neonates with PPHN, 46 (96%) babies had metabolic acidosis which gives a p value of <0.05 and was statistically significant (Table 2). A fall in pH and hypoxia cause pulmonary vasoconstriction, marked arterial spasm, a large right to left shunt and PPHN, particularly in babies with prenatal pulmonary arterial muscular hypertrophy [9]. Out of 48 babies who developed PPHN, 34 (71%) had polycythemia which is again statistically significant (p value is 0.039). Polycythemia had direct correlation with PPHN, however the exact mechanism of polycythemia causing PPHN is not clear, since a rise in pulmonary vascular resistance is not seen if fetal blood as opposed to adult blood is used to raise the haematocrit [10].

Risk factors for PPHN reported by other studies include positive pressure ventilation while resuscitation, respiratory distress syndrome, sepsis, maternal use of serotonin reuptake inhibitors, high maternal body mass index, nonsteroidal anti-inflammatory agents, structural abnormalities of the lung, especially congenital diaphragmatic hernia [6,7].

Conclusion

Prevalence of PPHN is quite high and 2D ECHO should be utilized as point of care in the

diagnosis and management of PPHN. ECHO is not performed routinely in neonates and our study signifies the importance of ECHO and indicates that it can be used for early diagnosis and prevention of complications of PPHN in NICU of developing countries. MAS, cesarean section, metabolic acidosis and polycythemia were important risk factors for PPHN in our study. Providing proper antenatal care as well as effective resuscitation measures at the time of birth may help in reducing the occurrence of PPHN.

Key Messages

2D ECHO should be utilized as point of care in the diagnosis and management of PPHN in all ventilated babies. Providing proper antenatal care as well as effective resuscitation measures at the time of birth may help in reducing the occurrence of PPHN.

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Conflict Of Interest: Nil

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Clinico-Pathological Correlation of Ovarian Malignancies

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Abstract

Context: Ovarian malignancy is a clinical entity that is diagnosed late, that is in an advanced stage of the disease. The present study highlights the correlation between the clinical and pathological features of neoplastic lesions of ovary in order to arrive at a better understanding of the disease process. The objective of study is to assess the overall incidence of various histological types of ovarian neoplasm, the pattern of occurrence of ovarian tumors in relation to age, parity and modes of presentations and to study the histopathological findings of various ovarian tumors. *Aims:* To study frequency and clinical presentation of ovarian malignancies and to correlate the clinical presentation of ovarian malignancies with the histopathological findings. *Setting and Design:* This cross sectional study was carried out at a tertiary care center catering both rural and urban population. *Materials and Methods:* Cases diagnosed with ovarian malignancy over a period of 4 years from April 2014 to March 2018 were included. Data was collected from the indoor files at the time of discharge. Data included detailed history of the women including history of presenting complaints, family history of malignancy, duration of symptoms to reporting to hospital, menstrual history and obstetric history. Relevant investigations like tumor markers level (CA125, inhibin, beta HCG, alpha fetoprotein, Alkaline phosphates) and USG findings were noted and CT scan reports were noted. Correlation of clinical diagnosis with histopathology was done. *Statistical Analysis used:* Statistical analysis was done as percentages of selected subjects and application of p value and Chi square test (wherever applicable).

Keywords: Ovarian Malignancy; Neoadjuvant chemotherapy; Tumor Marker; Histopathology.

Introduction

Ovarian neoplasm is the 3rd most common malignancy in India. The incidence of ovarian malignancy varies between 5.4-8 new cases per 1,00,000 women per year [1]. The spectrum of ovarian malignancy includes epithelial ovarian malignancy, germ cell tumor, sex cord stromal tumor and some unclassified ovarian malignancies. Epithelial ovarian malignancies are usually seen in perimenopausal and postmenopausal age group, germ cell tumors are seen in young age and the sex cord stromal tumor can be seen in all age groups i.e. young age, reproductive age group and after menopause. Clinical presentation of ovarian malignancies will depend upon the age group and type of ovarian malignancy but in few cases clinical presentation may not correlate with histopathology.

Hence, a cross sectional study of clinicopathological correlation of ovarian malignancy was carried out.

Aims and Objective

1. To study frequency of ovarian malignancy.
2. To study the clinical presentation of ovarian malignancies.
3. To correlate the clinical presentation of ovarian malignancies with the histopathological findings.

Materials and Methods

This cross sectional study was carried out at a tertiary care center catering both rural and urban population. Cases diagnosed with ovarian malignancy over a period of 4 years from April 2014 to March 2018 were included. Data was collected from the indoor files at the time of discharge. Data included detailed history of the women including history of presenting complaints, family history of malignancy, duration of symptoms to reporting to hospital, menstrual history and obstetric history. Relevant investigations like tumor markers level (CA125, inhibin, beta HCG, alpha fetoprotein, Alkaline phosphates) and USG findings were noted and women who underwent CT scan, CT scan reports were noted. Clinical diagnosis was made after history and investigations. Intraoperative findings of all cases which were operable were also noted. Those who were for neoadjuvant chemotherapy FNAC report was noted. Surgical staging of operable malignancies were also noted. Outcome measures assessed were age, parity, menopausal status, family history of malignancy, presenting complaints, symptoms to reporting, clinical diagnosis based on history, USG and CA125 levels and CT scan finding and surgical staging. Correlation of clinical diagnosis with histopathology was done.

Results

During study period gynecological admissions were 3152 cases. Total number of malignant cases in this study were 40 (1.27%).

Majority of ovarian malignancy were seen in the age group of 41-50 years 42.5%(14 cases) followed by 27.5% (9 cases) seen in the age group of 51-60 years. The number of cases seen in the young age were 6 with 7.5% (3 cases) in <20 years and 7.5% (3 cases) each in 21-30 years age group and in 31-40 years age group. There were 7.5% (3 cases) in the age group of 61-70 years (Fig. 1).

The incidence of ovarian malignancies was found mostly in more than 2 para women 37.5%(15 cases). The frequency of malignancy in nulliparous women was 22.5% (9 cases) and 57.5% (23 cases) had 2 or more children. The incidence in Primipara was 20%(8 cases). 60% (24 cases) women with ovarian malignancy were postmenopausal (Fig. 2).

There was a positive family history of malignancy in 22.5%(9 cases) of women, most commonly ovarian and breast cancer were present in first degree relatives, while 77.5% (31 cases) of women did not have any such family history.

Majority of patients presented with complaints of lump in abdomen 35% (14 cases) and distension of abdomen 17.5% (7 cases). Patients with advanced stage of disease presented with distension of

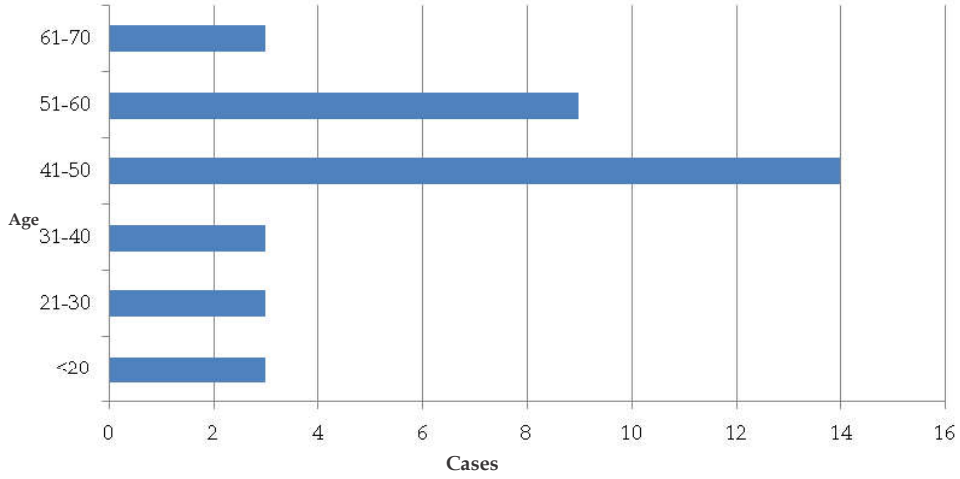

Fig. 1:

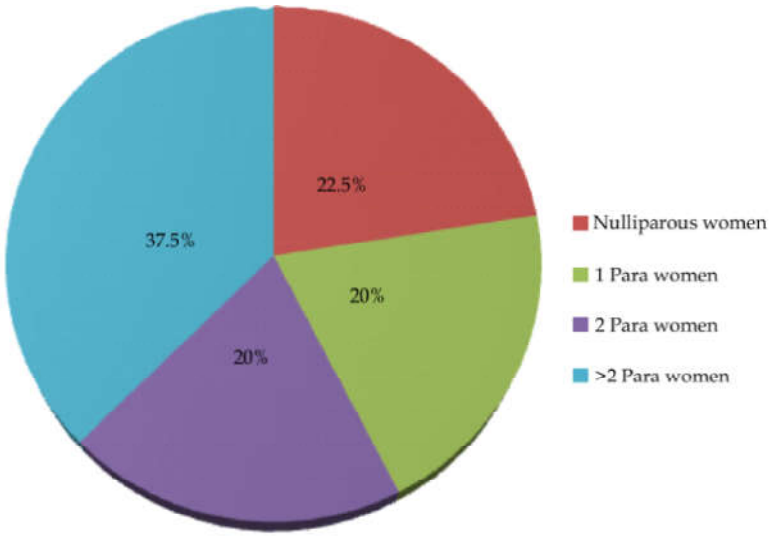

Fig. 2:

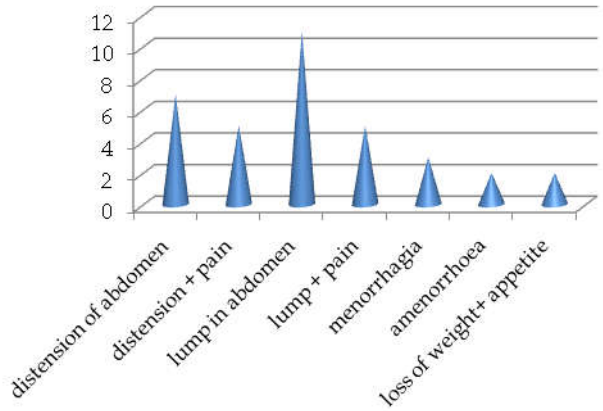

Fig. 3:

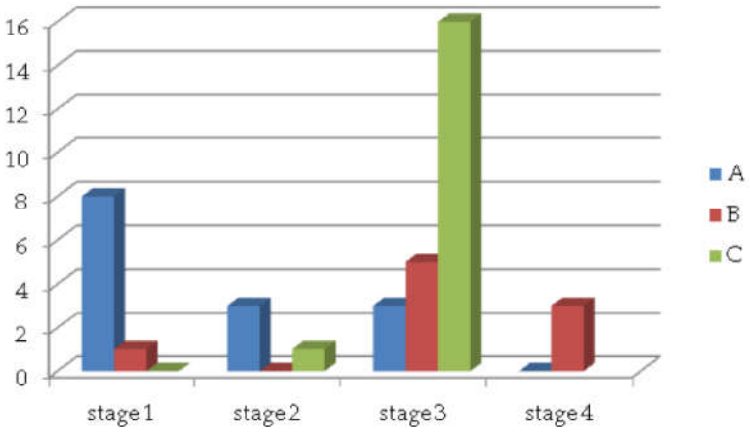

Fig. 4:

abdomen and loss of appetite and loss of weight 67.5% (27 cases). 7.5% (3 cases) had complaints of menorrhagia and 5% (2 cases) had amenorrhea.

The duration of symptoms to reporting to tertiary care center in majority of cases 62.5% (25 cases) was less than 1 month and in 30% (12 cases) it was within 1-3 months while in 7.5% (3 cases) the time period was 3-6 months.

Clinical diagnosis based on the history, findings of physical examination, radiologic imaging and tumor markers was made, according to which 4 cases (10%) were provisionally diagnosed as benign ovarian masses, 2 cases (5%) as germ cell tumours, 2 cases (5%) as granulosa cell tumor and

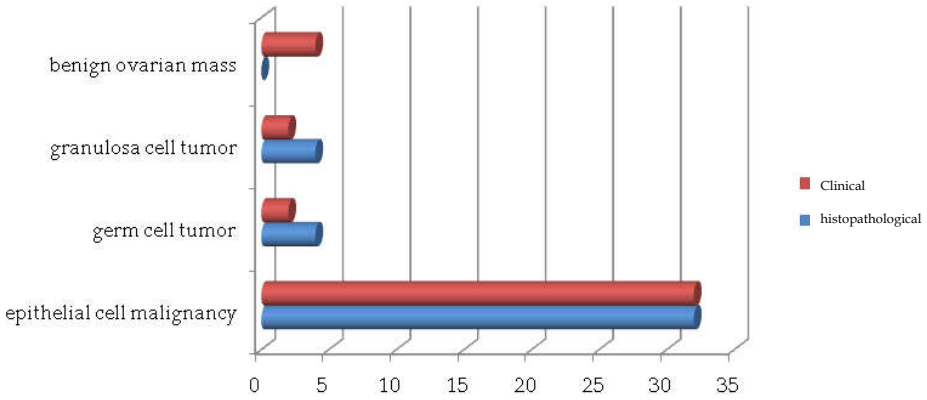

Fig. 5:

the majority 80% (32 cases) as epithelial cell tumors.

Stage of malignancy based on intraoperative findings was assessed. Majority of cases were in advanced stage of disease 67.5% (27 cases) III and IV stage, 22.5% (9 cases) were in stage I of disease while 10% (4 cases) were in stage II of disease. In young patients fertility sparing surgery was done (Fig. 3).

The histopathology reports of the specimen removed during laparotomy suggested that the most common malignancy was epithelial ovarian malignancy 80% (32 cases), 10% (4 cases) each of germ cell tumour and granulosa cell tumour (Fig. 4).

The pre-operative clinical diagnosis of 4 cases were made to be of benign ovarian masses, clinical diagnosis based on the intraoperative findings didn't suggest any malignant pathology but the histopathological reports of the specimen were found to have malignancy, immature teratoma in one case, high grade epithelial cell carcinoma in one case and granulosa cell tumour in the other 2 cases (Fig. 5).

Discussion

The mean age of women with ovarian malignancy in this study was 48 years with most of the cases belonging to the age group of >40 years. When the parameter of age was compared with different studies in India and western countries, it was found that the mean age of women with ovarian malignancy was higher in western world .Mean age of presentation in the study of Ruchika garg et al. [2] which was conducted in India was 41 years. Barbara A goff et al. [3] in their study had mean age of women as 45 years. Odukogbe et al. [4] reported >60% women with ovarian malignancy to be in the age group of >50 years. While Okugawa et al. [5] reported the age of women with malignant tumors as 51 years. In 2008 World Health Organization had estimated 224,747 new cases of epithelial ovarian cancer in the world population, of these 43% of ovarian malignancy were diagnosed in women older than 60 years old [6]. Approximately 50% of epithelial ovarian cancer cases registered in USA are diagnosed in women at the age of 60 years old or later [7]. In our study it was found that 17% cases were nulliparous, while 65.71 % of cases had more than 2 children emphasizing that malignancies are frequent in multiparous women. Ruchika et al. [2] reported nulliparity in 27.3% cases. In the study of Odukogbe et al. [4] only 19% were nulliparous, with 47.6% having had five or more deliveries. In our study it was observed that 62.85% of cases were postmenopausal. In the study by Ruchika et al. [2] 13.6% of malignancies occurred in postmenopausal group.

Family history of malignancy typically ovarian cancer, breast cancer and some gastrointestinal cancer have been found to be a risk factor associated with ovarian malignancy. This study has shown that there were 17% of women who had positive family history of malignancy in their first degree relatives (ovarian cancer and breast cancer). Only one patient (4.8%) had positive family history of malignancy in the study by Odukogbe et al. [4].

Women with ovarian carcinoma present with vague symptoms and have no early warning symptoms and signs to diagnose the malignancy. The course of development of ovarian carcinoma is insidious. It is thus often undiagnosed or referred to a tertiary care center when the disease has grown to an advanced stage of malignancy. In this study most frequent clinical symptom was found to be lump in abdomen 31.4% (11 cases) and distension of abdomen 20% (7 cases). Patients with advanced stage of disease presented with distension of abdomen and loss of appetite and loss of weight

62.85% (22 cases). Advanced stage of disease were additionally associated with abdominal pain. 8.5% cases had complaints of menorrhagia and 5.7% cases had amenorrhea. The duration of symptoms to reporting to tertiary care center in majority of cases 62.8% (22 cases) was less than 1 month and in 28.5% (10 cases) it was within 1-3 months while in 8.5% (3 cases) the time period was 3-6 months.

Non-specific gastrointestinal complaints, such as anorexia, dyspepsia, constipation are early manifestations of ovarian cancer, and may precede other, more definitive symptoms by weeks or months.

Ruchika garg et al. [2] observed abdominal distension in 73%, abdominal pain in 52%, constitutional symptoms in 21.5%, gastrointestinal symptoms in 10.5% and ascites in 40% cases. The duration of symptoms in malignant cases was less than 1 month in 54.6% cases.

Barbera A Goff et al. [3] observed that most common symptoms of malignant ovarian mass were back pain (45%), fatigue (34%), bloating (27%), constipation (24%), abdominal pain (22%), and urinary symptoms (16%). Women with malignant masses typically experienced symptoms 20 to 30 times per month and had significantly more symptoms of higher severity and more recent onset than women with benign masses or controls. The combination of bloating, increased abdominal size, and urinary symptoms was found in 43% of those with cancer but in only 8% of those presenting to primary care clinics.

Odukogbe [4] observed abdominal pain as the most commonest symptom.

Chan et al. [8] observed (90.0%) of women with ovarian malignancy had symptoms before the diagnosis. Abdominal pain or discomfort, abdominal distension, a palpable abdominal mass, menstrual, bowel, or urinary symptoms were the commonly reported symptoms. Eight (10.0%) patients were totally asymptomatic prior to the cancer diagnosis. The presence of bowel symptoms was significantly associated with late stage disease. Most of the patients sought medical advice within 2 weeks from the onset of symptoms. There was no association between the presence of any particular symptom(s) and the timing of presentation. There was also no correlation between the coping strategies and stage of disease and timing of presentation. On average, patients with early stage disease saw one more doctor compared to patients with late stage disease before the affirmative diagnosis of ovarian cancer.

Clinical diagnosis based on the history, findings of physical examination, radiologic imaging and tumor markers levels was made, according to which 4 cases (11.4%) were provisionally diagnosed as benign ovarian masses, 2 cases (5.7%) as germ cell tumours, 2 cases (5.7%) as granulosa cell tumor and the majority 77% (27 cases) as epithelial cell tumors.

In our study CA125 levels were also found to be raised with epithelial cell tumour except in one case where inspite of patient having high grade epithetlial cell carcinoma, patient had low levels of CA125.Though the recent advances in literature now doesn't mention CA125 levels to be diagnostic of ovarian malignancy and it has only remained as a prognostic determinant to assess the treatment of ovarian malignancies.

Stage of malignancy based on intraoperative findings was assessed. Majority of cases were in advanced stage of disease 62.85% (22 cases) III and IV stage, 9 cases (25.71%) were in stage I of disease while 4 cases (11.4%) were in stage II of disease. Data published by Kim et al. [9], who have reported an incidence of 39% of epithelial ovarian cancer detected in stage I, and 42.7% of epithelial ovarian cancer diagnosed in stage III in a study performed in Chicago, USA. In another study conducted in USA, the authors have observed the same disease pattern [10]. Ruchika et al. [2] found 68.2% cases to be in stage III and IV. Eighty-one per cent of the patients presented in Stages III and IV in the study by Odukogbe et al. [4]. The histopathology reports of the specimen removed during laparotomy suggested that the most common malignancy was epithelial ovarian malignancy 77.1% (27 cases), 11.4% (4 cases) each of germ cell tumour and granulosa cell tumor. Serous cystadenocarcinoma was diagnosed in 45.5% cases and mucinous cystadenocarcinoma was diagnosed in 27.3% cases by Ruchika et al. [2]. While Odukogbe et al. [4] stated that Epithelial ovarian cancer constituted about 76.2% of the cases.

The pre-operative clinical diagnosis of 4 cases were made to be of benign ovarian masses, clinical staging based on the intraoperative findings didn't suggest any malignant pathology but the histopathological reports of the specimen were found to have malignancy, immature teratoma in one case, high grade epithelial cell carcinoma in one case and granulosa cell tumour in the other 2 cases.

The age, history, clinical symptoms, radiologic imaging and CA125 levels of the patient diagnosed with immature teratoma were suggestive of benign cystic ovarian mass. The age and symptoms (secondary amenorrhea) of a patient diagnosed

with granulosa cell tumour were pointing towards mixed germ cell tumour. Age, clinical symptoms, low CA125 levels and radiologic findings of a patient were suggestive of dermoid cyst but later on intraoperative finding the mass was irregular and malignancy was suspected, which was later confirmed on the histopathological report suggestive of granulosa cell tumour stage 1a. Patient with USG finding suggestive of complex ovarian mass had normal CA125 levels but was diagnosed as high grade epithelial cell carcinoma on histopathological findings.

Conclusion

As ovarian malignancies usually present with advanced stage with poor prognosis there is definite role of creating awareness of this malignancy in women through educational activities as well as education of other pathy doctors by Continued Medical Education programme so that the women will be referred to the gynecology doctor early for routine gynecology checkup and for transvaginal sonography, this will help in reducing the morbidity and mortality associated with advanced stage ovarian malignancies.

Although clinicopathological correlation is there in majority of malignant cases, clinical suspicion of malignancy and appropriate management according to age and desire for fertility should be discussed with women before planning for surgery.

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To Study the Time of Separation of Umbilical Cord

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Abstract

Context: Umbilical cord is the lifeline of foetus. The usual time of separation of umbilical cord is 7 to 10 days. Some studies have shown that factors like sex, birth weight and mode of delivery affect the time of separation of umbilical cord.

Aims and objectives: The aim of this study is to investigate the time of separation of umbilical cord in the neonates and its relationship with various factors like sex, birth weight, gestational age and mode of delivery.

Methodology: Prospective study done at postnatal ward of KIMS, Hubli during May and June, 2018.

Results: A total number of 174 babies were enrolled in the study. Cord separation in order of frequency; 78 babies (44.8%) was between 4 to 6 days; for 59 babies (33.9%) between 7 to 10 days; for 21 babies (12.1%) after 10 days; for16 babies (9.2%) between 0 to 3 days. The earliest day of cord separation was 2 days on which 6 babies (3.4%) had cord fall and two babies (1.1%) had cord separation as late as 18 days. The meantime of separation of umbilical cord was 7.02 days. There was no statistical significance for cord separation between neonates of different mode of delivery, sex, gestational age and birth weight.

Conclusion: The meantime of separation of umbilical cord was 7.02 days. No relation could be established between time of cord separation and mode of delivery, sex, gestational age and birth weight.

Keywords: Umbilical Cord; Cord separation.

Introduction

Umbilical cord is the lifeline of foetus. The prenatal survival of the fittest is dependent on adequate functioning of the cord. The cord shrivels and falls after birth. The usual time of separation of umbilical cord is 7 to 10 days [1]. Some studies have shown that factors like sex, birth weight and mode of delivery affect the time of separation of umbilical cord [2-4]. An unpublished data from our college has shown that various factors affect the time of separation of umbilical cord even in healthy children. The aim of this study is to investigate the time of separation of umbilical cord in the neonates from postnatal word of Karnataka Institute of Medical Sciences, Hubli and its relationship with various factors like sex, birth weight, gestational age and mode of delivery.

Materials and Methods

A prospective study was conducted for 2 months during May and June, 2018 in the postnatal ward of Karnataka Institute of Medical Sciences, Hubli. The Mothers admitted in postnatal wards were approached in the hospital and written consent was obtained for participating in the study. All term, preterm appropriate for gestational age and

post term healthy neonates born by either vaginal delivery or Caesarean section and weighing > 2 kg were included for the study. Neonates with either prenatal or postnatal morbidity were excluded from the study. Gestational age was calculated from the last menstrual period of the mother. The Mothers were instructed not to apply anything to the cord. Babies were regularly followed in the hospital during the stay and the time of separation of umbilical cord was noted The Mothers of those babies whose umbilical cord did not separate during hospital stay were asked to report back after the separation of umbilical cord. Statistical analysis was done using mean, Standard Deviation, standard error of mean and Chi-square test.

Results

A total of 215 neonates met the inclusion and exclusion criteria and were taken for the study. Out of these, 14 babies could not be followed up as the parents did not return after discharge. A total number of 174 babies were enrolled in the study.

The earliest day of cord separation was 2 days on which 6 babies (3.4%) had cord fall (Table 1). Two babies (1.1%) had cord separation as late as 18 days.

Cord separation in order of frequency (Table 2); 78 babies (44.8%) was between 4 to 6 days; for 59 babies (33.9%) between 7 to 10 days; for 21 babies (12.1%) after 10 days; for16 babies (9.2%) between 0 to 3 days.

Out of 174 newborns 103 were vaginal delivery, 71 were caesarean delivery. In all these babies cord fall ranged between 2 to 18 days. In majority of vaginal births cord got separated between 4 - 6 days (50.48%); between 7 to 10 days in 29.12%; between 0 to 3 days in 10.6% and after 10 days 9.7 %. In babies born by Caesarean section cord got separated between 7 to 10 days in 40.84% followed by code fall between 4 to 6 days in 36. 61%; after 10 days in 15.49% and between 0 to 2 days in 7.04%. On evaluation the cord fall was between 4 to 6 days in 50.48% of babies born by vaginal deliveries with cord of 23 babies separating on 5th day. Among babies born by Caesarean section cord fall ranged between 7 to 10 days in 40.84% of babies (Table 3).

Twenty one (21) Preterm and 153 term babies were studied. Among the term babies, for maximum number of babies that is 71 (46.40%) cord separation was between 4 to 6 days; for 49 babies (32.02%) between 7 to 10 days; for 19 babies (12.41%) >10 days and between 0 to 3 days for 14 babies (9.15%).

Table 1: Frequency of cord fall at different days

Number of days	Frequency	Percent
2	6	3.4
3	10	5.7
4	13	7.5
5	34	19.5
6	31	17.8
7	17	9.8
8	17	9.8
9	17	9.8
10	8	4.6
11	6	3.4
12	4	2.3
13	2	1.1
14	2	1.1
15	3	1.7
17	2	1.1
18	2	1.1
Total	174	100
Mean days for cord separation	7.02	
Standard error of mean	0.241	
Standard deviation	3.181	

Table 2: Distribution of frequency of cord fall

Cord separation	Frequency	Percentage
0 – 3 days	16	9.2
4 – 6 days	78	44.8
7 – 10 days	59	33.9
>10 days	41	12.1
Total	174	100
Cord separation	Frequency	Percentage

Table 3: Mode of delivery range cross tabulation

Cord separation	Vaginal delivery	Caesarean section
0 – 3 days	11	5
4 – 6 days	52	26
7 – 10 days	30	29
>10 days	10	11
Total	103	71

Pearson Chi – square: Value - 5.275 (0 cells (0%) have expected count less than 5).; df – 3; Asymp. Sig. (2-sided) .153

Table 4: Gestational age range cross tabulation

Cord separation	Preterm	Term
0 – 3 days	2	14
4 – 6 days	7	71
7 – 10 days	10	49
>10 days	2	19
Total	21	153

Pearson Chi – square: Value – 2.159 (2 cells (25%) have expected count less than 5); df – 3; Asymp. Sig. (2-sided) .540

Table 5: Sex cross tabulation

Cord separation	Male	Female
0 – 3 days	7	9
4 – 6 days	35	43
7 – 10 days	32	27
>10 days	14	7
Total	88	86

Pearson Chi – square: Value – 3.805 (0 cells (0%) have expected count less than 5); df – 3; Asymp. Sig. (2-sided) .283

Table 6: Birth weight cross tabulation

Cord separation	Low birth weight	Normal weight
0 – 3 days	2	14
4 – 6 days	15	63
7 – 10 days	6	53
>10 days	6	15
Total	29	145

Pearson Chi – square: Value – 4.505 (2 cells (25%) have expected count less than 5); df – 3; Asymp. Sig. (2-sided) .212

For 10 (7.61%) preterm babies cord seperation was between 7 to 10 days; for 7 babies (33.33%) between 4 to 6 days; for 2 babies (9.52%) between 0 to 3 days and for 2 babies (9.52%) after 10 days (Table 4).

Eighty eight babies were males and 86 were females in our study. Out of 88 male babies cord got separated between 4 to 6 days for 35 babies (39.77%); between 7 to 10 days for 32 babies (36.36%); after 10 days for 14 babies (15.9%) and between 0 to 3 days for 7 babies (7.95%). Cord separation for 43 female babies (50%) was between 4 to 6 days; for 27 babies (31.39%) between 7 to 10 days; for 9 (10.46%) between 0 to 3 days and for 7 babies (8.13%) after 10 days (Table 5).

Among 174 babies studied 145 were normal birth weight. For 63 babies (43.44%) of normal birth weight cord separation ranged from 4 to 6 days; 53 babies (36.55%) from 7 to 10 days; 15 babies (10.34%) more than 10 days and for 14 babies (9.655%) between 2 to 3 days. 29 low birth weight babies were studied among which cord separation for 15 babies (51.72%) was between 4 to 6 days; for 6 babies (20.68%) between 7 to 10 days; for 6 babies (20.68%) more than 10 days; 2 babies (6.89%) between 0 to 3 days (Table 6).

Discussion

According to study the meantime of separation of umbilical cord was 7.02 days. For maximum number of babies 78 (44.8%) babies cord separation ranged between 4 to 6 days. On application of Chi square test for mode of delivery and time of umbilical cord separation, there is no relation between mode of delivery and time of cord separation. Similarly no relation could be established between birth weight of the baby, gestational age and sex of the baby with the time of separation of umbilical cord.

Conclusion

We conclude that the meantime of separation of umbilical cord was 7.02 days. No relation could be established between time of cord separation and mode of delivery, sex, gestational age and birth weight.

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Conflict Of Interest: Nil

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Study of Respiratory Distress in Newborn of North Karnataka Population

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Abstract

Ninety six patients with respiratory distress were admitted in NICU. 62 (64.5%) were males, 34 (35.4%) were females. 33 (34.3%) had more than 34 weeks gestation age, 63 (65.6%) had less than 34 weeks gestation age. 44 (45.8%) newborn had <1500 gram body weight, 52 (54%) newborn had >1500 gram body weight. Clinical manifestation were 30 (31.2%) had nasalflaring, 24 (25%) had chest in drawing, 14 (14.5%) had cyanosis, 12 (12.5%) had grunting, 9 (9.3%) were lethargic & 7 (7.2%) had hypothermia. The etiology was 20 (20.8%) had HMD, 17 (17.7%) had BA, 15 (15.6%) had MAS, 13 (13.5%) had TEF, 5 (5.2%) had CHD, 9 (9.3%) had TTN, 11 (11.4%) had Pneumothorax & 6 (6.21%) were Anemic. 21 (21.8%) had vaginal delivery, 59 (61.4%) had elective caesarian, 16 (16.6%) had emergency caesarian. Among the culture positive (39) common organism observed were *Kleibesella* 16 (41%), *Pseudomonas* 23 (23.9%), *E-coli*, 19 (19.7%), *S.auresis* 12 (12.5) and *CONS*. Apart from antibiotics neonates were treated - 39 (40.6%) with oxygen, 27 (28.1%) with mechanical ventilator, 21 (21.8%) withcontinuous positive airway pressure, 7 (7.2%) with surfactant & 2 (2%) with surgery. The discharge profile of neonates was, in 20 HMD cases 5 (25%) had deaths, in 17 BA 3 (17.6%) had death, in 15 MAS 2 (13.3%) had deaths, in 13 TEF 3 (23%) had deaths in 5 CHD, 1 (20%) had death, in 11 Pneumothorax 2 (18.1%) had deaths & in 6 anemic 2 (33.3%) had death. This practical approach to neonates with respiratory distress of different etiologies to cure will be quite helpful to guide theNeonatalogists, Pediatrician, Microbiologists and hospital personnel to handle such neonates efficiently and avoid morbidity and mortality as there is high mortality rate in neonates globally because of ambiguous clinical manifestations.

Keywords: Neonates; North Karnataka; Respiratory distress; Gestational age.

Introduction

Respiratory distress (RD) in neonates is one of the important clinical entitiesfor admission in neonatal Intensive care unit, (NICU) [1,2]. The prevalence of RD varies with gestational age and etiology of RD in neonates is quite varied and respiratory causes include hypoxic ischemic encephalopathy, transient tachypnea of neonates (TTN), Hyaline membrane disease (HMD), Meconium aspiration syndrome (MAS), Pneumothorax and diaphragmatic hernia. Other respiratory causes include cardiac failure, septicemia, metabolic disorders, renal failure, renal tubular acidosis, anemia, polycythemia, meningitis, intracranial bleeding etc. Although there has been tremendous advancement in the management of RD which has improved the outcome in these neonates like mechanical ventilation with different hybridmodes(both pressure and volume

controlled), High frequency jet ventilation, liquid ventilation, surfactant replacement therapy, Extracorporeal Membrane Oxygenation and sophisticated instruments for monitoring still there are 40-50% perinatal deathsreported in India and abroad [3,4]. Hence, attempt was made to study the outcome of newborns with RD with different gestational ages of both sexes and clinical outcomes of RD with various etiologies.

Material and Methods

141 newborn were admitted in NICU of KBN Institute of Medical sciences Hospital Kalburagi 585102 (Karnataka) having respiratory distress during the study period. History of each newborn including obstetric history, maternal diseases and mode of delivery were noted. Moreover weight, gender, gestational age, vital signs including respiratory distress and their etiology were studied. X-ray of chest, abdominal USG, ECHO was also studied. Laboratory investigation included CBC, CRP, reticulocyte count, blood culture and sensitivity, electrolytes, blood sugar. Blood gases were also done to confirm the diagnosis. Different etiologies of respiratory distress were classified with percentage.

Neonates having severe congenital anomalies [5], parents who did not give consent (39) maternal history of HIV (1) were excluded from the study. After exclusion 96 babies were enrolled in the study. The duration of the study was about 1 year (August 2017 to August 2018).

Observation and Results

Table-1: Clinical manifestation in neonates with respiratory distress, 30 (31.2%) had nasal flaring, 24 (25%) had chest in drawing, 14 (14.5%) had cyanosis, 12 (12.5%) had grunting, 9 (9.3%) were lethargic, 7 (7.2%) had hypothermia.

Table-2: Study of etiology of neonates with respiratory distress 20 (20.8%) had HMD, 17 (17.7%) had BA 13 (13.5%) had TEF, 15 (15.6%) had MAS, 5 (5.2%) CHD, 9 (9.3%) had TTN, 11 (11.4%) had pneumothorax 6 (6.2%) had anemia.

Table-3: study of mode of delivery in neonates with respiratory distress 21 (21.8%) had vaginal, 59 (61.4%) had elective (caesarian) delivery 16(16.6%) had emergency caesarian delivery.

Table 1: Clinical manifestation of neonates with respiratory distress (No of patients 96)

Sl no	Clinical manifestation	No of patients	Percentage (%)
1	Nasalflaring	30	31.2
2	Chest in drawing	24	25
3	Cyanosis	14	14.5
4	Grunting	12	12.5
5	Lethargic	9	9.3
6	Hypothermia	7	7.2

Table 2: Etiology of neonates with respiratory distress (No of patients 96)

Sl no	Diagnose	No of patients	Percentage (%)
1	HMD	20	20.8
2	BA	17	17.7
3	MAS	15	15.6
4	TEF	13	13.5
5	CHD	05	05.2
6	TTN	09	09.3
7	Pneumothorax	11	11.4
8	Anemia	06	06.2

HMD- Hyaline membrane diseases, BA=Birth asphyxia, MAS= Meconium Aspiration syndrome, Tracheo-Esophageal Fistula, TTN- Transient tachypnea of newborn CHD= congenital heart diseases

Table 3: Study of Mode of delivery in neonates with respiratory distress

Sl No	Types of Delivery	No of patients	Percentage (%)
1	Vaginal	21	21.8
2	Elective (caesarian)	59	61.4
3	Emergency (caesarian)	16	16.4

Table-4: character or base line study of neonates of respiratory distress, 33 (34.3%) were more than 34 weeks 63 (65.6%) were less than 34 weeks. 62 (64.5%) were males, 34 (35.4%) were females. 44 (45.8%) babies weighed <1500 grams while 52 (54.1%) had >1500g.

Table-5: The organism found in the blood culture with respiratory distress. 39 out 96 babies showed growth in blood culture. Among the babies whose blood culture shown growth following are the percentage of organism. 16 (41%) *Kleibesella*, 5 (12.8%) *S.Aeuresis*, 06 (1.4%) *E-coli*, 9 (23%) pseudomonas and 3 (.8%) were *Coagulase Negative staphylococcus (CONS)*.

Table-6: Types of treatment apart from antibiotics were 39 (40.6%) were treated with oxygen 27 (28.1%) were treated with mechanical ventilator 21 (21.8%) had continuous positive air way pressure 7 (7.2%) were treated with surfactant 2 (2%) underwent surgery due to CHD.

Table-7: Discharge profile of neonates admitted and treated. Out of 20 HMD (20.8%), 15 (75%) were cured 5 (25%) had died, out of 17 (17.7%) BA, 14 (82.3%) cured, 3 (17.6%) died. Among 15 (16.6%) MAS, 13 (86.6%) cured 2 (13.3%) died, In 13 (13.5%) TEF 10 (76.9%) cured, 3 (23%) died, out of 9 (9.3%) TTN 7 (77.7%) cured 2 (22.2%) died. In 11(11.4%) pneumothorax patients 9 (81.8%) cured 2 (18.1%) died. Among 6 (6.2%) anemia 4 (66.6%) cured 2 (33.3%) died.

Table 4: Character or Base line study of neonates of respiratory distress

Sl No	Particulars	No of patients	Percentage (%)
1	*Gestational age*		
	a) More than 34 weeks	33	34.3
	b) Less than 34 weeks	63	65.6
2	*Gender*		
	a) Male	62	64.5
	b) Female	34	35.4
3	*Body weight*		
	a) <1500 grams	44	45.8
	b) >1500 grams	52	54.1

Table 5: Common organism found in blood culture

Sl no	Organism	No of patients with blood culture Positive (39)	Percentage (%) of babies with blood culture positive
1	*Kleibesella*	16	41
2	*S. Aeuresis*	5	12.8
3	*E-coli*	6	15.4
4	*Pseudomonas*	9	23
5	*CONS*	3	7.8

Table 6: Types of treatment given to the neonates apart Antibiotics (No of patients 96)

Sl no	Treatment	No of patients	Percentage (%)
1	Oxygen	39	40.6
2	Mechanical ventilator	27	28.1
3	Continuous positive airway pressure	21	21.8
4	Surfactant	07	07.2
5	Surgery for CHD	02	02.0

Table 7: Profile of discharge of patients of respiratory discharge (No of patients)

Sl no	Diagnose	No of patients	cure	Percentage (%)	Death	Percentage (%)
1	HMD	20	15	75	5	25
2	BA	17	14	82.3	3	17.6
3	MAS	15	13	86.6	2	13.3
4	TEF	13	10	76.9	3	23
5	CHD	05	04	80	1	20
6	TTN	09	07	77.7	2	22.2
7	pneumothorax	11	09	81.8	2	18.1
8	Anemia	06	04	66.6	2	33.3

Discussion

In the present study of RD in newborn of North Karnataka population done at KBN Institute of Medical Sciences, Kalburagi-585102, 96 newborn were eligible. Their clinical manifestation were 30 (31.2%) nasal flaring, 24 (25%) chest in drawing, 14 (14.5%) had cyanosis, 12 (12.5%) had grunting, 9 (9.3%) were lethargic, 7 (7.2%) had hypothermia (Table-1). The etiology was 20 (20.8%) HMD, 17 (17.7%) were BA, 15 (15.6%) had MAS, 13 (13.5%) had TEF, 5 (5.2%) had CHD, 9 (9.3%) had TTN, 11 (11.4%) had pneumothorax, 6 (6.2%) had anemia (Table-2). Types of delivery, 21 (21.8%) vaginal, 59(61.4%) elective caesarian, 16 (16.6%) were emergency caesarian (Table-3). The characteristics or base line study was 33 (34.3%) were more than 34 weeks of gestational age, 63 (65.6%) were less than 34 weeks gestation period. There were 62 (64.5%) males and 34 (35.4%) females. 44 (45.8%) babies weighed <1500 grams, 52(54%) weighed >1500 grams (Table-4). The most common organism in blood (39) of RD newborn were 16(41%) Kleibesella, 5(12.8%) S. Aeuresis, 06(1.4%) E-coli, 9(23%) pseudomonas 3 (.8%) were CONS (Table-5). Apart from antibiotics 39 (40.6%) treated with oxygen, 27 (28%) with mechanical ventilator, 21 (21.8%) treated with continuous positive airway pressure 7 (7.2%) treated with surfactant replacement therapy 2 (2%) undergone surgery due to CHD (Table-6). The discharge profile RD newborn had, out of 20 HMD cases 5 (25%) deaths, out of 17BA cases 3 (17.6%) deaths, out of 15 MAS newborn 2(13.3%) had deaths, out of 13 TEF had 3 (23%)deaths. Among 5 CHD, 1 (20%) deaths. In 9 TTN cases, 2(22.2%) deaths. out of 11 pneumothorax, 2 (18.1%) deaths. In anemia cases patients 2 (33.3%) deaths occurred (Table-7). These findings were more or less in agreement with previous studies [5,6,7]. Most of the death in the present study occurred due to late admission as patients belonged to remote or tertiary areas, other risk factors included prematurity, meconium stained liquor, CHD and maternal fever leading to premature delivery and HMD, with significant reduction in HMD observed with antenatalcortico-steroids [8,9]. Most of the RD due to sepsis, pneumonia could be due to domestic labour by untrained dhai's in un-hygienic conditions.

It was also reportedthat caesarian section was the most common factor associated with development of TTN. This finding can be explained by the possibility that labour and delivery enhance neonatal lung adaptation by inducing surge of catecholamines in the fetus which stimulate the absorption of fetal lung fluid, inhibit secretion of fetal lung fluid which leads TTN [10].

It can be also hypothesized that most of the Indian woman suffer with OCD (obsessive Compulsion disorder) which causes strain and hyper secretion of neurotransmission and variations in the hormonal secretions. Under such condition if woman conceive it will impair the uterine environment and become unfavorable for proper growth of the fetus and fetus will have under developed or hyper developed musculo-skeletal system, which may result into RD. Moreover malnutrition of mother during pregnancy also play negative or hindrancerole in the development of fetus and newborn might develop multiple abnormalities including HMD and congenital anomalies. Sometimes these congenital anomalies cannot be pronounced radiologically and hematologically, leading to increased rate of morbidity and mortality of newborn.

Conclusion

The present study of RDin newborn in north Karnataka population will be quite useful to Neonatologists, Pediatrician and Pediatric surgeon to treat the newborn with RD which is challenging clinical problem, encountered in NICU. As mortality is very high, proper antenatalcare, prevention of pre-term delivery, planned institutional delivery, ANC (antenatal cortico-steroids), timely respiratory support (CPAP or Mechanical ventilation) may reduce the morbidity and mortality of newborn but this study warrants further genetic, embryological nutritional, patho-physiological, obstetric study because little is known about exact formation, duration of germ layers of fetus and mechanism of broncho-alveolar function in fetal life.

This research work was approved by ethical committee of KBN Institute of Medical Sciences and Hospital Kalburagi-585102 (Karnataka).

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Study of the Incidence of Hearing Impairment among Neonates with Hyperbilirubinemia

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Abstract

Background and objectives: Hyperbilirubinemia is associated with hearing impairment. This study was aimed to evaluate the incidence of hearing impairment among the term neonates with hyperbilirubinemia by using otoacostic emission (OAE) and auditory brainstem response (ABR). *Methods:* This one year hospital based prospective observational study was conducted from January 2017 to December 2017. A Total of 190 healthy term neonates with hyperbilirubinemia admitted at KIMS, Hubballi during the study period were studied. Most of the neonates were boys (60.53%) and boy to girl ratio was 1.53:1. History of consanguineous marriage was noted in 6.32% of the parents. The mean age was 4.73 ± 2.65 days. Majority of the neonates (97.37%) weighed between 2.5 to 3.5 Kg. The mean birth weight was 2.84 ± 0.84 Kg. The mean direct bilirubin levels were 0.88 ± 29 mg/dL and mean total bilirubin levels were 17.3 ± 2.58 mg/dL. During OAE-I, 33.16% of the neonates were advised to refer for second OAE and during OAE-II, 2.63% of the neonates were advised to undergo BERA. The incidence of hearing impairment based on BERA findings was 2.63%. 60.53% of the babies were born by LSCS while 39.47% were born through vaginal route and all the babies with hearing impairment had vaginal delivery while none of the baby with LSCS had hearing impairment (p=0.009). No association was found between hearing impairment in neonate with sex, age at admission and history of consanguineous marriage in parents and total bilirubin levels (p>0.050). Also the mean direct bilirubin, total bilirubin, birth weight, duration of NICU stay and age admission (p>0.050) were similar in babies with and without hearing impairment. *Conclusion and interpretation:* The present study showed incidence of hearing impairment as 33.16% based on OAE examination and 2.63% based on BERA.

Keywords: Auditory brainstem response; Hearing impairment; Hyperbilirubinemia.

Introduction

Neonatal Hyperbilirubinaemia, defined as a total serum bilirubin level above 5 mg per dL (86 µmol per L), is a frequently encountered problem [1]. Two-thirds of healthy term infants and almost all premature infants develop clinical jaundice in the first week of life [2]. Common risk factors for Hyperbilirubinaemia include fetal-maternal blood group incompatibility, prematurity, and a previously affected sibling [1,3]. Cephalohematomas, bruising, and trauma from instrumented delivery may increase the risk for serum bilirubin elevation. The auditory pathway is known as one of the most susceptible parts of the central nervous system to noxious agents. Severe neonatal hyperbilirubinaemia (HB) is a common cause of sensorineural hearing loss (SNHL) and auditory neuropathy (AN). If not controlled, HB

can lead to hyperbilirubinemic encephalopathy, or neonatal death.

SNHL is a severe sensory sequelae in young infants and its early diagnosis depends on systematic hearing screening. Hearing loss is different from that of other disability as it a hidden disability which is usually detected after 2 years of age, by which time there is irreversible stunting of the language development potential [4]. Hence, early diagnosis and intervention are crucial for improving linguistic development and prognosis of these children [5]. The present study was planned to evaluate the incidence of hearing impairments among the neonates with hyperbilirubinemia by using OAE and ABR due to the scarcity of data about hearing impairment in children with hyperbilirubinemia.

Aim

To evaluate the burden of hearing impairment among the term neonates with hyperbilirubinemia by using otoacostic emission (OAE) and auditory brainstem response (ABR).

Materials and Methods

This is a prospective observational study done at Department of Pediatrics, Karnataka Institute of Medical Sciences, Hubballi from January 2017 to December 2017. Term neonates with TSB that requires either phototherapy or exchange transfusion according to American Academy of Paediatrics (AAP) guidelines during the first two weeks of postnatal life were included. Neonates with congenital anamolies, on ototoxic drugs, dysmorphic features, syndromic features, chromosomal disorders, with family history of hearing loss or congenital deafness, TORCH infection, septicemia, pyogenic meningitis, Birth asphyxia and mechanically ventilated neonates were excluded. Term neonates underwent first OtoAcoustic Emission (OAE-I) before discharge. OAE-II and Brainstem evoked response audiometry (BERA) was done after three months. Based on prevalence of hearing impairment in children with hyperbilirubinemia - 8.6% [6] and error of 5%, sample size was calculated to be minimum of 126.

Results

A Total of 190 term healthy neonates with hyperbilirubinemia admitted to NICU of Karnataka Institute of Medical Sciences, Hubballi during the study period were studied. (Fig. 1) The data was analysed and the final results were tabulated and interpreted as below.

The neonates had mean total bilirubin levels of 17.3 ± 2.58 mg/dL and median levels were

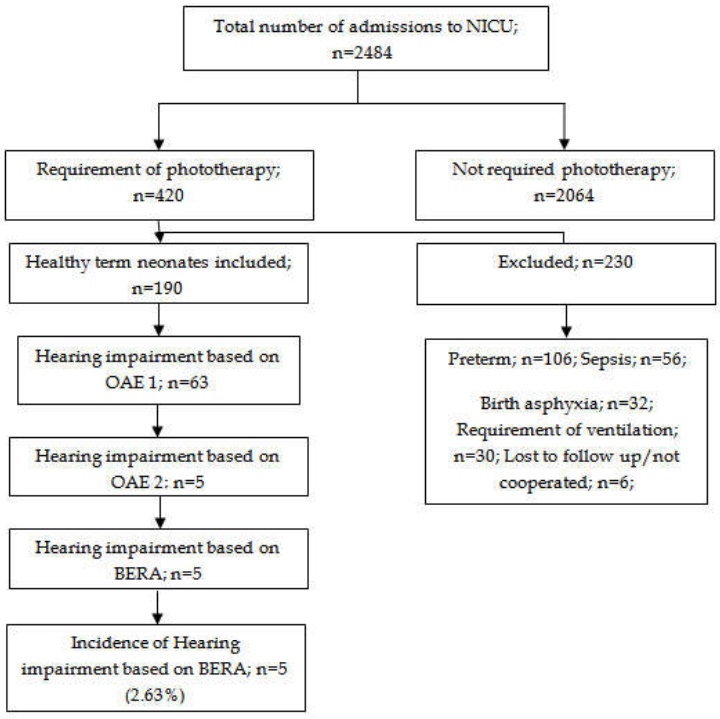

Fig. 1: Screening and Selection of neonates

17 mg/dL with range 10.8 to 24.2 mg/dL. 60.53% of the babies were boys and 39.47% of the babies were girls. The boy to girl ratio was 1.53:1. 82.11% of the babies were aged between >24 hours to 5 days. The mean age was 4.65 ± 2.23 days. The median age was 4 days and ranged between 2 to 15 days. History of consanguinity was noted in 6.32% of the parents. In the present study none of the neonates had family history of deafness. 60.53% of the babies were born by LSCS while 39.47% were born through vaginal route. 97.89% of the babies weighed between 2.5 to 3.5 Kg. The mean birth weight was 2.84 ± 0.29 Kg. The median birth weight was 2.8 Kg and ranged between 2.50 to 3.92 Kg.

In this study 28.95% of the neonates were advised to refer for second OAE based on right ear examination and 33.16% of the neonates based on left ear examination. 2.11% of the neonates were advised to undergo BERA after second OAE based on right ear examination and 2.63% of the neonates based on left ear examination. Five (2.63%) babies had hearing impairment on OAE-II examination which was further confirmed by BERA. Hence incidence of hearing impairment based on BERA findings was 2.63%.

In the present study no association was found between hearing impairment and sex of the baby (Table 1) (p=0.343); hearing impairment and age (Table 2) (p=0.631); history of consanguineous marriage among parents and hearing impairment (Table 3) (p=0.719). In this study all the babies with hearing impairment had vaginal delivery while none of the baby with LSCS had hearing impairment (Table 4) (p=0.009). In the present study incidence of hearing impairment was slightly high in neonates with total bilirubin levels of 20.00 to 25.00 mg/dL (3.33%) compared to those with 15.00 to 19.99 mg/dL (2.5%) and < 15.00 mg/dL (2.5%), but this difference was statistically not significant (p=0.966). (Table 5).

Table 1: Association of hearing impairment with sex

Sex	Hearing impairment				Total	
	No		Yes			
	No.	%	No.	%	No.	%
Male	111	96.52	4	3.48	115	115.00
Female	74	98.67	1	1.33	75	75.00
Total	185	97.37	5	2.63	190	100.00

p = 0.343

Table II: Association of hearing impairment with age

Age (Days)	Hearing impairment				Total	
	No		Yes			
	No.	%	No.	%	No.	%
< 24 hours	0	0.00	0	0.00	0	0.00
1 to 5	152	97.44	4	2.56	156	156.00
6 to 10	28	96.55	1	3.45	29	29.00
11 to 15	5	100.00	0	0.00	5	5.00
Total	185	97.37	5	2.63	190	100.00

p = 0.631

Table III: Association of hearing impairment with consanguinity

History of consanguineous marriage among parents	Hearing impairment				Total	
	No		Yes			
	No.	%	No.	%	No.	%
Yes	12	100.00	0	0.00	12	12.00
No	173	97.19	5	2.81	178	178.00
Total	185	97.37	5	2.63	190	100.00

p = 0.719

Table 4: Association of hearing impairment with mode of delivery

Mode of delivery	Hearing impairment				Total	
	No		Yes			
	No.	%	No.	%	No.	%
Full term normal vaginal delivery	70	93.33	5	6.67	75	75.00
Lower segment caesarean section	115	100.00	0	0.00	115	115.00
Total	185	97.37	5	2.63	190	100.00

p = 0.009

Table 5: Association between total serum bilirubin levels and hearing impairment

Total bilirubin levels (mg/dL)	Hearing impairment				Total	
	No		Yes			
	No.	%	No.	%	No.	%
< 15.0	39	97.50	1	2.50	40	40.00
15.00 to 19.99	117	97.50	3	2.50	120	120.00
20.00 to 25.00	29	96.67	1	3.33	30	30.00
Total	185	97.37	5	2.63	190	100.00

p=0.966

Discussion

Jaundice is the visible form of hyperbilirubinemia which is one of the frequent causes of neonatal hearing loss [7]. Since hearing loss is not a visible disorder, the adverse effects of hyperbilirubinemia on infants have not attracted attention. Infants who had been diagnosed and received voice amplification therapy and special training in the early period of their disease have been observed and the investigators reported that they had demonstrated psychological development and academic achievements in these infants nearing to those of their healthy peers [8]. Several studies have been conducted which have shown the various BERA abnormalities in high risk neonates and few studies in those with Hyperbilirubinaemia [9]. It has been postulated that there is a significant direct relationship between hearing loss and hyperbilirubinemia [10]. In this study on first OAE, 28.95% of the neonates were advised to refer for second OAE based on right ear examination and 33.16% of the neonates based on left ear examination. But, during second OAE, only 2.11% of the neonates were advised to undergo BERA after second OAE based on right ear examination and 2.63% of the neonates based on left ear examination. Similar findings of reversion back to normal of abnormal ear tests were found in other studies by Sharma P. et al., [11] and Deorari AK et al. [12]. The incidence of hearing loss noted in the present study was low compared to the studies by Shankar P. et al. [6] (8.6%), Aseel T. et al. [13] (17.4%), Sharma P et al. [11] (23.3%) Mirajkar S and Rajyadhyaksha S. [14] and Baradaranfar MH, et al. [15] The lower incidence of hearing impairment noted in present study can be explained by the fact that, the neonates were pertinently monitored for the development of hyperbilirubinemia and those who were likely to develop hyperbilirubinemia were identified timely and treated with double surface LED phototherapy which is very effective in decreasing TSB compared to conventional phototherapy. In the presents study most of the neonates (60.53%) were males and 39.47% of the babies were females with male to female ratio of 1.53:1. Hearing impairment was slightly high in maless (3.48%) compared to females (1.33%) but difference was statistically not significant (p=0.343). All the babies who were diagnosed to have hearing impairment had vaginal delivery (6.7%) while none of the baby with LSCS had hearing impairment and this observations was statistically significant (p=0.009). These findings suggest that, babies born through vaginal route and subsequently showing the evidence of hyperbilirubinemia at birth must undergo screening for hearing impairment. However these findings require further validation as this observation was derived from a smaller sample size which was the limitation of the present study. Perinatal asphyxia and use oxytocin might be the causes of this hearing impairment.

Conclusion

The incidence of hearing impairment in term neonates with hyperbilirubinemia was 2.63%. The risk of hearing impairment is high in

neonates who were delivered through vaginal route and develop hyperbilirubinemia. Hearing impairment in neonates with hyperbilirubinemia was independent of sex, age at admission, history of consanguineous marriage in parents. Strict monitoring, timely diagnosis and treatment of hyperbilirubinemia helps not only in the prevention of hyperbilirubinemia but also in prevention of hearing impairment.

Limitations

- Neonates with abnormal ABR were not followed up.
- relatively smaller sample size

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Conflict of Interest: Nil

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A study on Causes, Risk Factors, Prognosis and Different Methods of Management in Oligohydramnios During Each Trimester of Pregnancy

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Abstract

Background: Oligohydramnios is a severe and common complication of pregnancy that is associated with a poor perinatal outcome 1. Aim of this study is to identify etiological factors and to suggest measures needed to improve the perinatal outcome in pregnancies complicated by oligohydramnios. *Methods:* This is a descriptive prospective cross-sectional, hospital-based study, carried out at Dept of Obgy, GGH Jamnagar in the period from Sept 2017 to Aug 2018. The studied population were 100 pregnant women diagnosed as cases of oligohydramnios by sonologists using the criterion AFI less than or equal to 5 The data was collected using questionnaire, labor ward records and NICU records. The collected data were coded in a master sheet and analyzed by computer. *Results:* 44% participants were belonged to 23 to 27 age group and 58% participants were primigravida. 62% represented the group 13 to 26 weeks gestation. Study found FMC <10 in 51% of participants. 67% patients had c/f of PET. 47% delivery was done by vaginal route. 6% babies were still born and prematurity was the most common cause of still birth. Around 56% babies were low birth weight and congenital anomalies were present in 1% babies. APGAR score measured <7 at 1 minute was in 47% and <7 at 5 minutes was in 29% babies. 3% babies had NSAID exposure and perinatal mortality amongst those not protected by betamethasone coverage was 5%. *Conclusion:* Various risk factors that lead to oligohydramnios are identifiable and recognition of risk factors for oligohydramnios constitutes a part of basic prenatal and antenatal care. Routine AN corticosteroids coverage in patients of oligohydramnios and i.v. hydrotherapy can improve the perinatal outcome in pregnancies complicated by oligohydramnios. 5 min APGAR score, either alone or in combination of 1 min score instead of only 1 min score alone, is a better predictor of neonatal outcome. ELLSCS is the preferred mode of delivery and induced vaginal delivery is discouraged in cases of oligohydramnios.

Keywords: Oligohydramnios; Etiology; Risk factor; Management; Prognosis.

Introduction

The amniotic fluid that bathes the fetus is necessary for proper growth and development. It cushions the fetus from physical trauma, permits fetal lung growth, and provides a barrier against infection. Normal amniotic fluid levels vary, however, the average volume increases with

gestational age, peaking at 800-1000 ml which coincides with 36-37 weeks gestation. The condition of inadequate fluid, oligohydramnios, results in poor development of lung tissue and can result in fetal death [2].

The lack of amniotic fluid allows compression of the fetal abdomen limiting movement of the diaphragm. Minimal movement of the diaphragm and chest wall fixation leads to pulmonary hypoplasia. It is also associated with meconium staining of the amniotic fluid, fetal heart conduction abnormalities, poor tolerance of labor, lower Apgar scores, and fetal acidosis. Amniotic fluid volume is evaluated by visually dividing the maternal abdomen into 4 quadrants. The largest vertical pocket of fluid is measured in centimeters. The total volume is calculated by addition of four values. Oligohydramnios is defined sonographically as an amniotic fluid index (AFI) of less than 5 cm [3]. Primal sonographic sign of an obstetrical issue is abnormal amniotic fluid volume [4]. Absence or reduction of the fetal urine production or blockage in the urinary tract can result in oligohydramnios [5]. The first step is to identify the etiology of the decreased amniotic fluid volume. Medical care includes use of steroid to enhance fetal lung maturity if preterm delivery is anticipated. Maternal bed rest and hydration promote the increase of amniotic fluid by increasing the maternal intravascular volume.

Materials and Methods

This was a descriptive prospective cross-sectional, hospital-based study, carried out at Dept of Obgy, GGH Jamnagar in the period from Sept 2017 to Aug 2018. The studied population were 100 pregnant women diagnosed as cases of oligohydramnios by sonologists using the criterion AFI less than or equal to 5. Decision of delivery by vaginal route or elective/ emergency LSCS was done as required. Some patients were already in labour and others allowed to go into spontaneous labour The patients were followed as an inpatients or outpatients till delivery in the same hospital. The fetal outcomes were assessed immediatly after delivery.

Inclusion Criteria: Antenatal patients with atleast one visit in each trimester with a valid USG report and with intact membranes.

Exclusion Criteria: Antenatal patients having medical or surgical illnesses, premature rupture of membranes, multiple pregnancies and received fetal shunt surgeries were excluded from study.

Observation and Results

Table 1:

Age Group	No of patients
18-22	31
23-27	44
27-31	22
32-36	3

Table 1 shows the age distribution of the study population: patients between age 23-27 years represented 44% of the study population and those between 32-36 years represented 3%.

Table 2:

S/E class of patient	No of patients	Received treatment	% of patients who took treatment
Lower	58	45	77%
Middle	39	31	79%
Upper	3	3	100%

Table 2 shows socioeconomic distribution of patients with oligohydramnios. It shows that the lower and middle classes were less likely to take treatment.

Table 3:

GA at diagnosis	No of patients	Perinatal mortality	% of perinatal mortality
Upto 12	0	NA	
13-26	19	2	10
27-37	62	3	4
38-40	19	1	5

Table 3 shows distribution of the gestational age at diagnosis: 62% represented the group 13 to 26 weeks gestation, group 27 to 37 weeks gestation represented 62% while those more than 40 weeks gestation made up 19% of the study population.

Maximum perinatal mortality (10%) occurred in early onset (13-26 weeks G.A.) oligohydramnios.

Table 4:

	No of patients	% of patients
Decreased fm	51	51%
Abdo pains	34	34%
None	15	15%

Table 4 shows distribution of the presenting complains. 51% patients had c/o decreased fetal movement, 34% had abdo pain while 15% had no complaints.

Table 5:

OBS index	No of patients
Primi	58
Second	31
Multi	11

Table 5 shows distribution of patients according to obstetrical index.

While 58% were primigravidae, 31% were second gravidae, and 11% were multigravidae.

Table 6:

	No of patients	Perinatal mortlaity	% of total
PET	67	4	6%
Congenital anomaly	1	1	100%
Placental anomaly	0	NA	NA
Maternal hypotension	22	1	4.5%

Table 6 shows that 67% had signs or symptoms of PET and 1% had congenital anomaly while 22% cases had maternal hypotension.

Table 7:

	No of patients	AFI<3	% of patients who had AFI<3
NSAIDs	3	3	100%
No. drug exposures	97	26	27%

Table 7 shows that 3% had exposure to NSAIDs while 97% had no exposure to any of the drugs commonly implicated in oligohydramnios.

Table 8:

AFI	No of patients	NICU admissions	% of total cases
5	22	6	27
4	25	7	28
3	29	5	17
2	12	3	25

Table 8 shows that % of the study population AFI=5, % had 22 cases, AFI=4 hada 25 cases, 29% had AFI=3, 12% had AFI=2 & 11% had AFI=1.. Maximum NICU admissions (65%) occurred in the group with AFI<3.

Table 9 shows that there is a significant association between the Steroid coverage and the outcome in form of resuscitation and NICU admission. While only 20% outcomes with steroid coverage needed NICU admissions, 24% of the non steroid covered fetuses needed neonatal admission. And while only 2% fetuses who received steroid died;close to 9% fetuses who didn't receive steroid expired. Antenatal corticosteroid coverage can reduce the perinatal morbidity from 24% to 20% & perinatal mortality from 9% to 2%.

Table 10 shows that 21% received no treatment and 14% had NICU admissions while 17% had hydrotherapy and 62% had arginine with respective admission of 17% and 27% So i.v. hydrotherapy is the best option for treatment.

Table 11 shows distribution of the study population according to the mode of delivery.

Table 9:

AN steroid Prophylaxis	No of patients	Resuscitation & admission	Perinatal mortality	Mortality expressed in % of total patients
Steroid coverage	39	8	1	2.5%
No steroid coverage	61	15	5	8.9%

Table 10:

Mode of treatment	No of patients	NICU admissions	Perinatal mortalities	Mortality expressed in % of total patients
Oral hydrotherapy	21	3	3	14%
I.V. Hydrotherapy	17	3	0	0%
Arginine	62	17	3	4.8%

Table 11:

	No of patients	NICU admissions	Admissions expressed as % of total patients	Perinatal mortality	Mortality expressed as % of total patients
EmLSCS	29	3	10%	1	34%
ElLSCS	28	3	10%	0	0%
SVD	39	10	25%	3	7.6%
IVD	4	0	0%	2	50%

Table 12:

	No of patients	NICU admissions	Perinatal mortality	PNM expressed as % of total patients
1-1.5 KG	8	4	2	25%
1.6-2 KG	12	6	3	25%
2.1-2.5KG	36	7	0	0%
>2.5 KG	44	6	1	2.5%

Table 13:

	APGAR <7 at 1 min	Perinatal mortality	% of total	APGAR <7 at 5 min	Perinatal mortality	% of total
No of neonates	47%	6	12%	29%	5	17%

29% delivered by EmCS, 28% underwent ElLSCS and 39% had SVD while 4% had IVD. Maximum NICU admissions (25%) occurred in the group with spontaneous vaginal delivery & maximum perinatal mortalities (30%) also occurred in the same group.

Table 12 shows weight distribution of the outcomes: 8% of the study population were between 1 & 1.5 kg, 12% were between 1.6-2 kg, 36% were between 2-2.5 kg and 44% were >2.5 kg. Maximum NICU admissions occurred in < 2 kg group(50%). Chances of mortality reduced after achieving birth weight >2 kg.

Table 13 shows that 29% of the outcomes needed resuscitation and NICU admission at 5th min APGAR values. In our study birth weight had significant association with neonatal mortality as all the babies weighing more than 2000 grams survived and the babies weighing less than 1000 grams expired. Mortality rate was 15.85% in babies weighing 1000-1499 grams and 5.35% in babies weighing 1500-1999 grams.

Discussion

In the study maximum number of patients were in their twenties but this could be simply due to maximum fertility in this age group. While only 3% of patients belonged to higher socioeconomic class; 97% belonged to middle and lower socioeconomic class implying higher prevalence of oligohydramnios in lower and middle s/e class.

In the study most (58%) of patients were primigravidae implying that it is a risk factor in the development of oligohydramnios by yet unidentified mechanisms. Most patients of oligohydramnios present with a complain of decreased fetal movement (51%) which is obviously due to restricted mobility due to lesser liquor amnii. Early onset of oligohydramnios is associated with higher perinatal mortality which can be due to longer exposure to the direct or indirect effects of the predisposing cause of oligohydramnios.

The number of patients who had some features of PET amounted to 67 & the higher perinatal mortality in this group is suggestive of adverse impacts of PET on pregnancy including IUGR, PTL, etc. Indomethacin is a potent cause of oligohydramnios as implied by the higher incidence (100%) of oligohydramnios in the group taking the drug when compared to the lower incidence in the group which did not take the drug (26%). As far as the treatment options are concerned i.v. hydrotherapy appears superior to arginine as demonstrated by the lower NICU admission rates in the group given i.v. hydrotherapy. Also appropriate antenatal corticosteroid coverage can reduce the perinatal morbidity from 24% to 20% & perinatal mortality from 9% to 2%.

During the study 2 outcomes were stillborn implying that oligohydramnios, though not an often cause of sudden IUFD, can still cause stillbirths. While maximum morbidities occurred in the patients who had spontaneous induction of labor (25%) the maximum mortalities occurred in the group with induced vaginal delivery (50%). As far as lscs is concerned while the rate of NICU admission is same for both elective and emergency cesarean section, the mortality in case of elective surgery is 0 implying its superiority to the emergency lscs. 56% of the neonates born to oligohydramniotic mothers had low birth weight suggesting a higher prevalence of IUGR & PTL due to oligohydramnios. Even though almost half of newborns showed a poor APGAR score(<=7) at 1st min of birth the presence of poor APGAR score at 5th min is associated with higher (27%) occurrence of perinatal mortality.

Conclusion

To reduce the incidence of the adverse pregnancy outcome concerning the mother and the fetus we recommend the following

- There is a need to increase the awareness regarding oligohydramnios amongst pregnant women and improve the health seeking behavior by promoting frequent and early AN USG & early institution of interventions in diagnosed cases of oligohydramnios.
- The presence of features of PET in patients of oligohydramnios should be dealt with vigilantly.
- The study recommends routine AN corticosteroids coverage in patients of oligohydramnios and i.v. hydrotherapy is better than arginine in treatment of oligohydramnios.
- The study recommends reliance on 5 min APGAR score either alone or in combination of 1 min score instead of only 1 min score to improve the perinatal outcome.
- Lastly the study recommends ElLSCS as the preferred mode of delivery and discourages the induced vaginal delivery in cases of oligohydramnios.

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Evaluation of Amniotic Fluid Index - Correlation with Maternal and Fetal Outcome

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Abstract

Aim: The present study was undertaken to know the incidence of polyhydramnios and oligohydramnios in our hospital. *Method:* This prospective study conducted on 150 antenatal women between 28 to 42 weeks of gestation. 50 pregnant women with oligohydramnios, 50 women with normal amniotic fluid index (AFI) and 50 women with polyhydramnios were studied. *Results:* The incidence of oligohydramnios was 4% and polyhydramnios was 1%. In oligohydramnios group, 56% were primi gravida and 44% women were multigravida. In polyhydramnios group, 64% were multigravida and 36% were primigravida. Induction of labour was done in 66% of oligohydramnios women. In polyhydramnios group, 60% had vaginal delivery and 40% women underwent caesarean section. Meconium staining of liquor was seen in 16% of oligohydramnios, 14% of polyhydramnios and 14% of normal AFI women. In oligohydramnios, 8.16% of the babies had APGAR < 7 at 5 min, 26% had birth weight <2.5 kg, newborn intensive care unit (NICU) admission was seen in 20.4% and PNM was 2%. In polyhydramnios, 10.8% of the babies had APGAR < 7 at 5 min, 14% had birth weight <2.5 kg, NICU admission was seen in 21.7% and perinatal death was 16%. Congenital anomalies were seen in 2% of oligohydramnios babies, 13% of polyhydramnios and 2% of normal AFI group babies. *Conclusion:* Amniotic fluid assessment has become an important part of ante-partum fetal surveillance and also it has a prognostic value for fetal and new born outcome.

Keywords: Amniotic Fluid Index; Maternal outcome; sonography.

Introduction

Amniotic fluid is vital to the well-being of the fetus. It serves several roles during pregnancy. Amniotic fluid volume is the sum of inflow and outflow of fluid into the amniotic space and as such reflects fetal fluid balance. Clinical estimation of amniotic fluid volume is an important part of fetal assessment as variation in its amount has been related to a variety of pregnancy complications. Diagnosis is generally made by measuring the amniotic fluid compartment using sonographic criteria. Oligohydramnios is diagnosed when ultrasonographically the AFI is ≤ 5 cm or a single deepest pocket of 2 cm [1]. It affects 3-5% of pregnancies [2]. Oligohydramnios is associated with adverse perinatal outcome like fetal distress, meconium staining, low APGAR and increased perinatal morbidity and mortality. Polyhydramnios is diagnosed when the deepest vertical pocket of amniotic fluid is 8 cm or greater, amniotic fluid index above 25 cm. Incidence is around 1% of all pregnancies. The etiology of polyhydramnios is diverse and involves many maternal and fetal conditions including diabetes mellitus, congenital anomalies, isoimmunisation, multiple gestation and placental abnormalities. Half of the cases are found

to be idiopathic. A specific cause was identified in only 16% of the mild polyhydramnios, 90% for moderate and 100% for severe polyhydramnios [3]. So assessment of amniotic fluid index is a helpful tool in determining the risk for potentially adverse maternal and perinatal outcome [15,17]. This study is conducted to evaluate the amniotic fluid index and its correlation with maternal and perinatal outcome.

Materials & Methods

This is a prospective study conducted on 150 antenatal women in the Department of obstetrics and gynaecology, Narayana medical college and hospital, Nellore during the period of November 2015 to October 2017. The study group comprised of pregnant women between 28-42 weeks of gestation fulfilling inclusion and exclusion criteria. Selection of cases was based on detailed history like duration of amenorrhea, fetal movements, past obstetric history, medical history regarding hypertension, diabetes and renal disease were recorded.

On clinical examination presence of anemia, pedal edema, blood pressure were recorded. Routine examination of cardiovascular and respiratory system was made. Per vaginal examination was done to note the Bishop's score and adequacy of pelvis for women beyond 37 weeks of GA. All the cases were subjected to routine blood investigations like blood grouping, Rh typing, HIV, HbsAg, VDRL, GTT, urine routine and microscopy.

Detailed ultrasound examination was done and AFI was measured using Phelan's four quadrant ultrasound technique. The uterus is arbitrarily divided into four quadrants by the umbilicus transversely and the linea nigra vertically. The largest vertical pocket free of fetal parts and umbilical cord loops in each quadrant was measured and AFI was taken as a sum of the four quadrants, in cm. An AFI of 5.1 - 24 cm is normal. AFI ≤ 5 cm is considered Oligohydramnios and ≥ 25 cm is considered a polyhydramnios. Written informed consent was taken from the study group. 50 pregnant women with oligohydramnios, 50 women with normal AFI and 50 women with polyhydramnios were included in the study.

The following outcomes were assessed: Mode of delivery; Meconium staining of liquor amnii; APGAR at 1 minute and 5 minutes; Birth weight; NICU admission.

Inclusion Criteria: Pregnant women between gestational age 28 to 42 weeks with intact membranes. Singleton pregnancy. Pregnant women with fetal congenital anomalies and high risk pregnancies like diabetes, hypertension, renal diseases, preeclampsia etc., are also included in the study.

Exclusion Criteria: Pregnant women with gestational age less than 28 and more than 42 weeks are excluded from the study. Premature rupture of membranes. Multiple pregnancy.

Statistics: Values expressed in mean percentages. Analysis was carried out in MS Excel sheet and corresponding graphs were mentioned.

Results

Incidence in setup: 13092 deliveries recorded in our hospital, in which 523 cases were oligohydramnios (4%) and 130 cases (1%) were identified as polyhydramnios. By inclusion criteria, 50 pregnants with Oligohydramnios, 50 women with Polyhydramnios, and 50 women with normal AFI were recruited as the study population.

Booked vs Unbooked: 76% of oligohydramnios, 72% of polyhydramnios and 64% of normal AFI group were unbooked cases in the present study.

Age wise Distribution: In the present study the age distribution varied from 18-40 years. 6% of Oligohydramnios, 2% of polyhydramnios and 6% of normal AFI group were less than 20 years of age. 56% of oligohydramnios, 48% of polyhydramnios and 60% of normal AFI group belong to 20-24 years age group. 32% of oligohydramnios, 36% of polyhydramnios and 30% of normal AFI group belong to 25-29 years age group. 6% of oligohydramnios, 14% of polyhydramnios and 4% of normal AFI group were ≥30 years of age. 78% in the oligohydramnios group, 90% in the polyhydramnios group and 76% in the normal AFI group came from rural background. 88% of oligohydramnios, 90% of polyhydramnios and 82% of normal AFI group belong to low socio economic status.

Parity: 56% of oligohydramnios, 36% of polyhydramnios and 46% of normal AFI group were primigravida. 34% of oligohydramnios, 44% of polyhydramnios and 40% of normal AFI group were second gravida. Whereas 10% of oligohydramnios, 20% of polyhydramnios and 14% of normal AFI group were multigravida.

Gestational Age: Majority of the women had gestational age >37 weeks i.e., 86% in oligohydramnios, 78% in polyhydramnios and 92%

in normal AFI group. 6% of oligohydramnios, 18% of polyhydramnios and 8% of normal AFI group were between 34 -36 weeks. 8% of oligohydramnios, 4% of polyhydramnios were between 28-33 weeks.

Antepartum complications: Anemia, PIH and preterm were the common complications in the antepartum period. 44% of oligohydramnios, 48% of Polyhydramnios and 38% of normal AFI group were anemic. 14% of oligohydramnios, 12% of polyhydramnios and 6% of normal AFI group had PIH. Preterm labour was seen in 14% of oligohydramnios, 22% of polyhydramnios and 8% of normal AFI group. Diabetes was seen in 14% Polyhydramnios, 2% of normal AFI groups. IUGR was seen in 12% of oligohydramnios, 6% of polyhydramnios and 2% of normal AFI group. Abruption was seen in 2% of polyhydramnios. Malpresentations was seen in 2% of oligohydramnios, 6% of polyhydramnios and 4% of normal AFI group (Fig. 1).

Mode of Delivery: In the present study 44% of oligohydramnios, 58% of polyhydramnios and 64% of normal AFI group had vaginal delivery. 4% of oligohydramnios, 2% of polyhydramnios and 4% of normal AFI group had instrumental delivery. Whereas 52% of oligohydramnios, 40% of polyhydramnios and 32% of normal AFI group underwent caesarean section.

Induced vs Spontaneous Vaginal delivery: 32% of oligohydramnios, 22% of polyhydramnios and 16% of normal AFI group women had induced vaginal deliveries. Whereas 16% of oligohydramnios, 38% of polyhydramnios and 52% of normal AFI group women had spontaneous vaginal deliveries.

Emergency Vs. Elective cesarean section: In the present study 34% of oligohydramnios, 20% of polyhydramnios and 20% of normal AFI group women underwent Emergency caesarean section. Whereas 18% of oligohydramnios, 20% of polyhydramnios and 12% of normal AFI group had Elective caesarean section.

Indications for Cesarean section in Oligohydramnios: In oligohydramnios group, indications for Elective LSCS was previous LSCS in 10% women, oligohydramnios in 6% women and malpresentation in 2% women. Whereas the indication for Emergency LSCS was fetal distress in 18% women followed by failed induction in 12% women, failed progress in 2% women and failed forceps in 2% women.

Indications for caesarean section in Polyhydramnios: In polyhydramnios group, the indications for Elective LSCS was polyhydramnios in 6% women, malpresentation in 6% women, Previous lscs in 4% women and CPD in 4% women. Whereas for Emergency LSCS, failed induction was the indication in 8% women, failed progress in 2% women, DTA in 4% women, fetal distress in 4% women and MSL in 2% women.

Indications for caesarean section in normal AFI group: In the normal AFI group, indications for elective LSCS was previous LSCS in 4% women, malpresentation in 4% women, CPD in 2% women and central placenta previa in 2% women. Whereas for Elective LSCS, failed induction was the indication in 8% women, fetal distress in 4% women, failed progress in 2% women, failed forceps in 2% women and prolonged 2nd stage in 2% women.

Intrapartum & Postpartum Complications: The most common complication was PPH seen in 16% of polyhydramnios group and blood transfusion was required in 24% of polyhydramnios group. The other complications were Urinary tract infection and wound infection (Table 1).

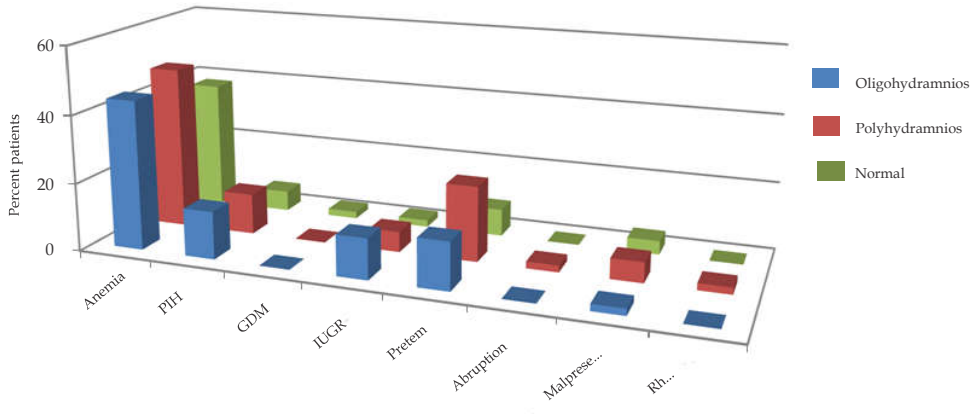

Fig. 1: Antepartum complications

Table 1: Intrapartum and postpartum complications

Complications	Oligo		Poly		Normal	
	n/t	%	n/t	%	n/t	%
PPH	1/50	2	8/50	16	2/50	4
Blood transfusion	8/50	16	12/50	24	6/50	12
Febrile illness	2/50	4	6/50	12	2/50	4
UTI	2/50	4	6/50	12	2/50	4
Wound infection	0	0	2/50	4	0/50	0

*AFI–Liquor characteristic:*16% ofoligohydramnios, 14% of polyhydramnios and 14% of normal AFI group had meconium staining of liquor.

Birth Weight: Birth weight was less than 2.5 kg in 26% of oligohydramnios group, 14% of polyhydramnios group and 8% of normal AFI group. Birth weight was between 2.5-3 kg in 62% of oligohydramnios, 32% of polyhydramnios and 74% of normal AFI group. Birth weight was 3.1-3.5 kg in 12% of oligohydramnios, 36% of polyhydramnios and 14% of normal AFI group. Whereas birthweight is > 3.5 kg in 18% of polyhydramnios and 4% of normal AFI group.

APGAR at 1 min: APGAR was <7 at 1 min in 22.44% of oligohydramnios and 17% of polyhydramnios group babies. Whereas only 8% of normal AFI group had APGAR <7 at 1 min. 8.16% of oligohydramnios, 10.8% of polyhydramnios and 6% of normal AFI group babies had APGAR <7 at 5 min (Table 2).

Table 2: AFI vs APGAR at 5 min

APGAR	Oligo		Poly		Normal	
	n/t	%	n/t	%	n/t	%
<7	4/49	8.16	5/46	10.8	3/50	6
>7	45/49	91.8	41/46	89.1	47/50	94

Nicu Admission: 20.4% of oligohydramnios, 21.7% of polyhydramnios and 14% of normal AFI group babies were admitted in NICU.

Perinatal death rate: 2 women (4%) in polyhydramnios group had IUD. 2% in Oligohydramnios and 4% in polyhydramnios were still births. 4% women in oligohydramnios and 8% in polyhydramnios group had early neonatal death (Table 3).

Table 3: AFI vs perinatal mortality rate

	Oligo		Poly		Normal	
	n/t	%	n/t	%	n/t	%
Live births	49/50	98	46/50	92	50/50	100
IUD	0	0	2/50	4	0/50	0
Still Birth	1/50	2	2/50	4	0/50	0
END	2/50	4	4/50	8	0/50	0
PNMR	3/50	6%	8/50	16%	0	0

Congenital anomalies: Renal agenesis was seen in 2% of babies of oligohydramnios women. In polyhydramnios, Anencephaly was present in 2 babies (4%), Dandy walker malformation in 1 baby (2%), Congenital Diaphragmatic hernia in 1 baby (2%), Tracheo esophageal fistula in 1 baby (2%), cardiac anomaly in 1 baby (2%) and Multiple anomalies in 1 baby (2%). Whereas in normal AFI group cardiac anomaly was present in 1 baby (Table 4).

Table 4: AFI vs Congenital anomalies

	Oligo		Poly		Normal	
	n/t	%	n/t	%	n/t	%
Renal Agenesis	1/50	2	0/50	0	0/50	0
Anencephaly	0/50	0	2/50	4	0/50	0
Dandy Walker Malformation	0/50	0	1/50	2	0/50	0
CDH	0/50	0	1/50	2	0/50	0
Tracheo esophageal fistula	0	0	1/50	2	0	0
Cardiac anomalies	0	0	1/50	2	1/50	2
Multiple anomalies	0	0	1/50	2	0	0

Discussion

Total number of women delivered during the study period was 13,092, out of which 523 cases were oligohydramnios and 130 cases were polyhydramnios. This study was done to know the incidence of oligohydramnios and polyhydramnios and feto maternal outcome in relation to liquor status.

The reported incidence of oligohydramnios world wide varies between 1-5% pregnancies and polyhydramnios varies between 1-3%. In the present study, the incidence of oligohydramnios was 4% corresponding to the quoted incidence and also corresponds with the study done by Amany Hamed et al., 2015 (4%) and Aesha patel et al., 2015 (4.1%) [4,5].

Incidence of oligohydramnios is expected to be higher now a days because of advanced maternal age and associated medical diseases especially renal diseases and essential hypertension, but it remains static.

In the present study, the incidence of polyhydramnios was 1%. It corresponds to the quoted incidence and also to the study done by Aesha patel et al., 2015 (1.1%) and Biggio et al., 1999 (1%). In older studies, the incidence of polyhydramnios was higher (3.5%) which is now declining to 0.2% in recent studies [6]. This shift is due to earlier diagnosis of fetal anomalies,

better diagnosis and management of pregnancies complicated by maternal diabetes and declining incidence of Rh isoimmunisation.

Majority of the women in our study constitute unbooked cases i.e., 76% of oligohydramnios, 72% of polyhydramnios and 64% of normal AFI group. Majority of the patients in the present study belong to low socio economic status i.e., 88% of oligohydramnios, 90% of polyhydramnios and 82% of normal AFI group even though there is no direct relationship between liquor status and socioeconomic status.

Oligohydramnios is more common in primigravida [7,8,9]. 56% of the oligohydramnios women were primigravida in the present study which is close to the study done by Amany Hamed et al. 2015, (58%).

Polyhydramnios is more common in multigravida. In the present study, 64% of polyhydramnios women were multigravida. Most of them were 2nd and 3rd gravida, and it is close to the study done by Reddi Rani et al., 2003 (63%) and Wende Myhra, 1992 et al. (63%)[10,11]. Although the incidence of polyhydramnios is more in grand multiparae, there is a downward trend in this matter as many women are opting for sterilization after 2nd and 3rd delivery. 86% of oligohydramnios, 78% of polyhydramnios and 92% of normal AFI group were >37 weeks of gestation. Patients with mild forms of hydramnios usually continued till term while those with acute and severe forms presented earlier in the gestation and ended in preterm delivery. The incidence of severe forms of AFI abnormality were decreasing owing to the custom of midtrimester ultrasound as a routine investigation to rule out fetal anomalies.

Anemia was seen in 44% of oligohydramnios, 48% of polyhydramnios and 38% of normal AFI groups. The rate of anemia is high in developing countries, as so in pregnancy and its association with liquor status.

In the present study, one women with Grade II Abruptio placenta was noted, although it is seen more frequently in severe polyhydramnios with sudden decompression of uterus [12-14].

In the present study the incidence of PIH was 12%, and it is correlating with the study done by Sudha et al., 2013 (12%). Over distended uterus is a risk factor for PIH [12].

The association with the Diabetes Mellitus was 14% in the present study which is close to the study done by Kaukab Tashfeen et al., 2012 (15%). Polyhydramnios is more common with uncontrolled or undiagnosed Diabetes Mellitus and its severity is realted to maternal blood sugar levels [13].

The incidence of preterm labour in the present study was 22% which corresponds with the study done by Enrico volante et al., 2004 (22%) [14]. The incidence of malpresentation in the present study is 6% which is close to the study done by Sudha et al., 2013 (5%). Higher rate of preterm delivery in polyhydramnios is due to over distended uterus.

In the present study 48% of oligohydramnios group women underwent vaginal delivery whereas 52% of women underwent caesarean section, and it is close to the study done by Bhagat et al., 2013 (44% and 56%) [15-17]. 66% of oligohydramnios women were induced in the present study which is close to the study done by Sita ghimire et al., 2017 (70%) [18]. Induction rate is higher in oligohydramnios group when compared to polyhydramnios group (42%) and normal AFI group women (36%). In the present study, 60% of women with polyhydramnios underwent vaginal delivery and 40% women underwent caesarean section which is close to the study done by Manjula et al., 2017 (62% and 38%) [19].In the present study, 34% of oligohydramnios group women underwent Emergency caesarean section whereas 20% of polyhydramnios women and 20% of normal AFI group women underwent emergency cesarean section.

In the present study fetal distress (52.9%) was the most common indication for Emergency caesarean section in the oligohydramnios group which is close to the study done by Nazlima et al., 2012 (58%)[16]. Whereas fetal distress was the indication in 22.22% and 20% of polyhydramnios and normal AFI groups respectively. The most common complication associated with polyhydramnios was PPH seen in 16% of the women and required blood transfusion in 24% women. Other postoperative complications were urinary tract infection and wound infection. The incidence of PPH was high in the present study (16%) when compared with the other studies. PPH rate was high in polyhydramnios. This is due to over distended uterus fails to contract in the third stage of labour. The associated anemia in the present study was the reason for higher number of blood transfusions in the study group. 16% of oligohydramnios women and 14% of women with normal AFI had meconium staining of liquor which correlates with the study by Bhagat et al., 2014 (16% and 14%)[15]. In the present study there is no significant difference in the meconium staining of liquor between the three groups. With careful antepartum fetal surveillance, timely decision for termination and continuous intrapartum fetal

monitoring in high risk cases, there is significantly reduced incidence of meconium stained liquor.

The incidence of LBW in polyhydramnios group was low in the present study (14%) when compared to the study done by Kuang Chao et al., 2005 (32.3%) [20]. In the present study, 22.44% babies had APGAR <7 at 1min in oligohydramnios group which is close to the study done by Jun Zhang et al., 2004 (19.2%). Whereas in the normal AFI group, 8% babies had APGAR <7 at 1 min [21].In the oligohydramnios group, 20.4% babies were admitted in NICU which is correlating with the study done by Purvi et al., 2017 (20%). 21.7% of polyhydramnios babies were admitted in NICU which is close to the study done by Kuang cha chen et al. 2005, (18.67%) [20]. Whereas 14% of normal AFI group babies were admitted in NICU. There is no difference in the NICU admission between the oligohydramnios and polyhydramnios groups. In the present study perinatal death was 6% in oligohydramnios group which is correlating with study done by Golan et al., 1994 (6.3%) [22]. Renal agenesis was seen in 1 baby with oligohydramnios. In polyhydramnios, Anencephaly was present in 2 babies (4%), Dandy walker malformation in 1 baby (2%), Congenital Diaphragmatic hernia in 1 baby (2%), Tracheo esophageal fistula in 1 baby (2%), cardiac anomaly in 1 baby (2%) and Multiple anomalies in 1 baby (2%). Whereas in normal AFI group cardiac anomaly was present in 1 baby.

Conclusion

Oligohydramnios is associated with an increased incidence of induction of labour, increased rate of emergency caesarean section for fetal distress, low birth weight babies and NICU admission. The present study demonstrates that careful fetal examination has to be performed when polyhydramnios is diagnosed as congenital malformations are often associated with this condition. These anomalies if detected early timely termination of pregnancy can be done hence less physical and psychological trauma to the mother. Hence, Amniotic fluid assessment has become an important part of ante-partum fetal surveillance and also it has a prognostic value for fetal and new born outcome.

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Placental Factors Affecting Fetal Growth: Review Series 3

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Abstract

Placenta is the link between mother and foetus. A healthy placenta is the single most important factor in producing a healthy baby. Placenta plays a vital role in all aspects of pregnancy from implantation to delivery. Fetal growth may be affected by changes in maternal-placentofetal transport of nutrients, energy producing substrates and oxygen. Abnormal placentation results in poor placental perfusion and placental insufficiency. Placenta is the central support organ for developing foetus.

Keywords: Placenta; Fetal Growth; Placental Insufficiency; Hormones.

Introduction

A healthy placenta is the single most important factor in producing a healthy baby. The placenta, which is in fact part of the fetus, is critical for all aspects of pregnancy from implantation to delivery. The primary function of the placenta is the effective transmission of nutrient substances to the fetus. The fetal growth may be affected by changes in the maternal placento – fetal transport of [1]:

- Nutrients
- Energy producing substrates
- Oxygen

Placenta is the link between mother and foetus. In normal pregnancy, the growth of the Placenta remains concordant with growth of the fetus.

Fetal growth is interplay of various factors:

* Maternal

* Fetal

* Plecental

* Environmental

* Hormonal

* Genetic factors

In review series 1 and 2, we had discussed fetal and maternal factors affecting fetal growth. In this review series 3, we will explore placental factors affecting fetal growth.

In normally evolving pregnancies the fetal growth process is mainly conditional by inherent potential, this potential depends on many factors that can be considered as constitutional and proportional to maternal BMI, many factors alter normal growth process of foetus leading to its restriction or acceleration. Both restriction of fetal growth and acceleration (macrosomia) are of major clinical interest due to increased frequency of fetal, neonatal and maternal complications [2].

Abnormal Placentation [3]

Abnormal placentation resulting in poor placental perfusion and placental insufficiency is the most common pathophysiology associated with IUGR.

Structural Placental Abnormalities Associated with Iugr:-

- Placental abruption
- Placental infarction
- Circumvallate placenta
- Haemangioma and chorioangioma of placenta
- Infection like villitis

Battledore placenta [4,5]

Battledore Placenta is placenta in which the umbilical cord is attached at the placental margin. The shortest distance between the cord insertion and placental edge is within 2 cm. Complications associated with battledore Placenta are mainly:-

- Intrauterine growth restriction
- Preterm labour
- Decreased birth weight

Circumvallate Placenta

Circumvallate Placenta is a form of extrachorial placenta, with a raised placental margin in an annular shape. Circumvallate Placenta is associated with intrauterine growth restriction.

Decidualization is impaired in IUGR placenta, result of complex interaction of many endocrine, placental, and paracrine factors determined by [6]:-

* Placental and ovarian steroids
* Corticotropin-releasing factors
* Prostaglandin E2

Placental lactogen (PL) is produced by the placental trophoblast in some species (human, sheep, rat) and is secreted into the fetal circulation, but at a much lower rate than into the maternal circulation [7]. The major physiological role of PL was thought to be the mobilization of maternal energy stores, through its action as an insulin antagonist [7], but it is also thought to stimulate maternal IGF secretion [8]. More recently, it has been reported that ovine PL stimulates amino acid uptake by fetal rat muscles, glycogen synthesis by fetal rat liver, and IGF-II release by rat fibroblasts [9-11]. Human PL has been shown to stimulate somatomedin release in cultured human fetal myoblasts and fibroblasts [12].

A healthy baby at term is the product of three important factors [13]:

- Healthy mother
- normal genes
- good placental implantation and growth.

A Normally functioning Placenta is required for normal fetal growth and development.

Fetal Growth Rates [14,15]

Ultrasound estimation of fetal growth parameters and fetal weight estimations are the most important screening methods. If the insult to nutritional supply to the foetus is in early pregnancy i.e. before 20 weeks, then all fetal organs show growth restriction proportionately. This is labelled as symmetrical IUGR. If the nutrition to the fetus is reduced at a later stage in pregnancy i.e. after 20 weeks due to faulty placentation and uteroplacental insufficiency, then the result will show disproportionate growth, this is labelled as a asymmetrical IUGR.

Discussion

Slow growth of the foetus in utero maybe a reflection of chronic placental insufficiency. During pregnancy, the foetus depends on the placenta and the umbilical vessels for transport of oxygen and nutrients from the maternal blood. In placental insufficiency, the ability of the placenta to act as organ of transfer is a vital factor [16].

Targeting intracellular signalling molecules to improve placental growth is under research. Growth factors have similar roles within the placenta. Although each Ligant binds to distinct receptors on the cell surface, each receptor initiates common intracellular signalling cascade through the action of both kinase and phosphatase, and there are studies demonstrating that the expression of these protein is essential for growth factor responses in the normal human placenta. The placental expression of numerous proteins within this cascade is altered in fetal growth complications. Instead of supplementing maternal growth factor levels, the greatest therapeutic benefits in pregnancies complicated by altered fetal growth will arise by developing mechanisms to specifically manipulate the expression or activation of signalling molecules which are common to multiple growth factor receptor within the placenta [17].

Small Placenta could be associated with IUGR. The Placenta is a central support organ for the developing foetus, knowledge of the placental anomaly and its variations, as well as pathological conditions associated with pregnancy, is mandatory to interpret fetal well being and fetal growth. This will enable the obstetrician to plan right intervention at right time [18].

The Placenta is the most accurate record of the infant's prenatal experiences. Placenta provides insight into placental life [19].

--->Benirschke (1981)

Conclusion

For good perinatal outcome, optimum fetal weight is essential, both IUGR and macrosomia are hazardous. Fetal growth is dependent on various nutrients. Transport of these nutrients from mother is via placenta. Placental pathologies and abnormalities like placental infarction, chorioangioma, villitis, circumvallate and battledore placenta will reduce transfer of nutrients to foetus. Chronic placental insufficiency occurs due to medical disorders like diabetes and hypertension. Placental hormones also play role in fetal growth. Normal structure and function of placenta is vital for healthy foetus.

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[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540-7.

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Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3-9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792-801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

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Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. p. 7-27.

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[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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