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Prevalence Of Neonatal Jaundice And Its Risk Factors In Neonates At Saveetha Medical College And Hospital In Chennai.

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ABSTRACT

****Introduction:****

Jaundice, characterized by yellowish discoloration of the skin, is a common condition in newborns, often arising from increased bilirubin levels. While physiological neonatal jaundice is typical, pathological jaundice poses clinical challenges and is a leading cause of neonatal readmission, morbidity, and mortality. Rarely, severe jaundice can lead to kernicterus, a condition with serious neurological implications. Understanding the incidence and risk factors of neonatal jaundice is crucial for effective management.

****Methodology:****

This study aimed to identify prevalent risk factors for neonatal jaundice at Saveetha Medical College and Hospital in Chennai. The study included healthy term neonates born between February and April 2022. Inclusion criteria encompassed term, healthy neonates, while exclusion criteria involved critically ill or preterm neonates. Data on various risk factors were collected from medical records and analyzed, including maternal age, neonate's sex, gestational age, birth weight, family history of jaundice, ABO/Rh incompatibility, mode of delivery, and others.

****Results:****

Maternal sociodemographic distribution revealed a majority aged 20-34 years. Among neonatal characteristics, male sex predominated, and most neonates had birth weights ≥ 2.5 kgs. Notably, a proportion of neonates exhibited jaundice across various parameters, such as gestational age, ABO/Rh incompatibility, and mode of delivery. For instance, 13.3% of babies born between 37-42 weeks had jaundice, and 15.3% without a family history of jaundice developed it.

****Conclusion:****

The study underscores the significance of understanding risk factors associated with neonatal jaundice. Findings suggest that factors such as maternal age, gestational age, birth weight, and mode of delivery may influence the likelihood of neonatal jaundice. Early identification and management of these risk factors are essential for preventing complications and reducing neonatal morbidity and mortality rates.

Categories: Neonatology, Pediatrics, Medical Education

Keywords: Neonatal jaundice, Risk factors, Maternal age, Gestational age, Mode of delivery

*****INTRODUCTION*****

Jaundice is the yellowish discoloration of the skin, sclera and mucous membranes resulting from deposition of bilirubin as a result of either increased breakdown of red blood cells or decreased hepatic excretion or sometimes both [1]. Physiological neonatal jaundice is a very common occurrence in newborn but when it becomes pathological it also becomes the clinical problem that requires close attention as it is the most common cause of neonatal readmission during neonatal period. It is accountable for 70% of the neonatal morbidity and 10% of the neonatal mortality [2,3]. In rare instances, the TSB reaches levels that can cause kernicterus, a condition characterized by bilirubin staining of neurons and neuronal necrosis involving primarily the basal ganglia of the brain and manifest as athetoid cerebral palsy, hearing loss, dental dysplasia, and paralysis of upward gaze [4]. Incidence and risk factors of neonatal jaundice vary according to ethnicity, economic status, genetic factors, environmental factors and geographical differences prevailing in different communities. The present study was undertaken to determine the prevalent risk factors for neonatal jaundice at Saveetha Medical College and Hospital in Chennai.

*****STUDY SAMPLE, STUDY DESIGN AND MATERIALS AND METHOD*****

This is a hospital based cross-sectional study. The study population included all healthy term neonates born at Saveetha Medical College in Chennai from February to April 2022. All babies were managed according to standardized protocol when needed.

Inclusion criteria:

- Term babies defined as neonates born after 37 completed weeks of gestation.
- Healthy babies not on any medication.
- Mothers who gave informed consent.
- Neonates 6 hrs. and older.

Exclusion criteria :

- Neonates who were critically ill or admitted to NICU.
- Preterm neonates.
- Neonates with incomplete medical records.
- Neonates whose mothers were critically ill and unable to give informed consent.

After getting informed consent, data regarding certain risk factors that can cause neonatal jaundice were obtained, they were mother's age, sex of neonate, gestational age during delivery, birth weight, family or sibling history of jaundice, 5 minutes APGAR score, ABO incompatibility, Rh incompatibility, type of pregnancy, type of delivery, mode of delivery, oxytocin during labour, duration of labour. Data were collected from the medical records of the patient. Data were transferred to an Excel data sheet. Results were summarized in the form tables.

*****RESULTS*****

Maternal sociodemographic distribution and Neonatal characteristic distribution are given in **Table 1**.

The majority of mothers fell within the age range of 20 to 34 years, comprising 94 individuals. Among these, 20 babies were born with neonatal jaundice, accounting for 13.3% of the total. Furthermore, deliveries occurred between gestational ages of 37 to 42 weeks for 120 mothers, with 20 of their babies experiencing jaundice (also 13.3%). Notably, a predominant proportion of babies were male, totaling 103, among whom 20 developed jaundice (13.3%). Among babies with a birth weight of ≥ 2.5 kg, which numbered 132, 16 were diagnosed with

jaundice (10.7%). Additionally, among fetuses with Five Minute APGAR scores ranging from 7 to 10 (a total of 112), 13 were found to have jaundice (8.7%). Interestingly, 130 babies did not have a family or sibling history of jaundice, yet 23 of them were affected by jaundice (15.3%). Moreover, out of 120 babies without ABO incompatibility, 6 were diagnosed with jaundice (4.0%), while among 139 babies lacking Rh incompatibility, 22 experienced jaundice (14.7%).

Maternal pregnancy related factors are given in **Table 2**.

The majority of mothers were primigravida, totaling 110, among whom 21 babies were diagnosed with jaundice (14.0%). Of the deliveries, 103 were through normal vaginal delivery, with 28 babies developing jaundice (18.7%). Additionally, among the subset of 103 deliveries requiring instrumental assistance, 20 babies were jaundiced, constituting 19.4%. Among those mothers who received oxytocin during labor, which accounted for 86 out of the 103 normal vaginal deliveries, 17 babies were diagnosed with jaundice, making up 16.5% of this group. Furthermore, among the 90 mothers with a normal duration of labor, 8 babies were affected by jaundice, representing 7.7% of this subset.

VARIABLE	CATEGORY	TOTAL FREQUENCY	JAUNDICED FREQUENCY	PERCENTAGE JAUNDICED
Mother's age	<20yrs	30	07	4.6%
	20 – 35 yrs	94	20	13.3%
	>35 yrs	26	06	4.0%
Sex of neonate	Male	103	20	13.3%
	Female	47	13	8.7%
Gestational Age (in weeks)	<37 weeks	10	08	5.3%
	37 – 42 weeks	120	20	13.3%
	>42 weeks	20	05	3.3%
Birth weight (in kgs)	<2.5 kgs	18	17	11.3%
	≥ 2.5 kgs	132	16	10.7%
Five Minute APGAR score	≤ 6	38	20	13.3%
	7 - 10	112	13	8.7%
Family or Sibling history of jaundice	Yes	20	10	6.7%
	No	130	23	15.3%
ABO incompatibility	Yes	30	27	18%
	No	120	06	4.0%
Rh incompatibility	Yes	11	11	7.3%
	No	139	22	14.7%

Table 1- Maternal sociodemographic distribution and Neonatal characteristic distribution

Table 2 - Maternal pregnancy related factors

VARIABLE	CATEGORY	TOTAL FREQUENCY	JAUNDICED FREQUENCY	PERCENTAGE JAUNDICED
Type of pregnancy	Single	110	21	14%
	Multiple	40	12	8.0%
Type of delivery	Normal Vaginal Delivery (NVD)	103	28	18.7%
	Caesarean section (CS)	47	05	3.3%
Mode of delivery	Instrumental	43	20	19.4%
	Non instrumental	60	08	7.7%
Oxytocin during labour	Yes	86	17	16.5%
	No	17	11	10.7%
Duration of labour	Normal	90	08	7.7%
	Prolonged	13	20	19.4%

*****DISCUSSION*****

The overall prevalence of neonatal jaundice in our study was 22% which was similar to a study conducted at the University of Benin Teaching Hospital. The study focused on neonatal jaundice, a common cause of admissions among newborns. Over a period of three years, 26.5% of admissions were due to jaundice, with a higher incidence among babies born outside the hospital. Gender distribution was nearly equal, but there was a notable difference in age at presentation, with out-born babies presenting later than those born in the hospital. Additionally, out-born babies had higher bilirubin levels, indicating a potentially more severe condition. Unfortunately, mortality rates were relatively high, especially when jaundice was accompanied by conditions like sepsis or prematurity, with out-born babies facing a higher risk. The study emphasized the importance of early detection and proper management of neonatal jaundice to improve outcomes and reduce mortality rates. [5]

In our study, maternal age within the range of 20 to 35 years demonstrated a prevalence rate of 13.3%. In contrast, a study by EyasuA. Lake et al. revealed a stark increase to 86.6% within the same age group [2]. Another study by Anahita Izadi et al. highlighted significant correlations between maternal age, weight, BMI, WBC, Hb, PLT, birth in the first pregnancy, number of pregnancies, prolonged delivery, and bilirubin levels. Maternal age emerged as a statistically significant factor, exhibiting a drastic decrease to 5.6% [6,7]

Srivastav et al. identified higher serum bilirubin levels in neonates born to younger mothers, indicating that maternal age, as a demographic factor, was not standardized across geographic areas, with prevalence rates varying regionally[8]

Furthermore, A previous study has also suggested a potential link between maternal age ≥ 30 years and an increased risk for neonates.[9]

Regarding gender predisposition to jaundice, our study revealed a male predilection rate of 53.3%, similar to the findings of EyasuA. Lake et al., who reported a male predilection rate of 59.8% [6]. This underscores male sex as a significant risk factor for neonatal jaundice, a finding supported by studies conducted in Nepal and Nigeria

[10,11]. Conversely, findings in Croatia, Iran, and Egypt contradicted this result. [12,13,14] his discrepancy could imply that male newborns possess relatively immature livers, potentially impacting bilirubin processing [15,16].

In our study, ABO incompatibility accounted for 18% of jaundice cases, consistent with findings by Bedowra Zabeen et al. [17]. Gestational age during delivery between 37 to 42 weeks resulted in a prevalence rate of approximately 13.3%, akin to the findings of Carolyn G. Scrafford et al. [10]

Family or sibling history exhibited a percentage of only 6.7% in our study, contrasting sharply with the 57.9% reported by EyasuA. Lake et al., suggesting it may not be a significant risk factor [6].

A five-minute APGAR score of ≤ 6 conferred an increased risk of neonatal jaundice by 13.3%, closely aligning with findings by Hanneke Brits et al. This underscores the importance of considering a decreased APGAR score not only as a risk factor for jaundice but as a medical emergency [18].

Normal vaginal delivery, prolonged labor, and multiparity demonstrated significant rates of 18.7%, 19.4%, and 14%, respectively, consistent with findings by Hanneke Brits et al., highlighting their importance as parameters for consideration [18].

CONCLUSION

In our study male sex of the baby , ABO and RH incompatibility, Preterm labour, Normal vaginal delivery and prolonged labour are considered to be the major risk factors causing neonatal jaundice. Neonatal jaundice is one of the most common causes of neonatal morbidity in the neonatal intensive care unit (NICU).Therefore, improving newborn care and timely intervention for neonates with ABO/Rh incompatibility are recommended alongwith regular blood test and appropriate intervention for mothers an fetus who are at high risk of developing neonatal jaundice.

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Disclosures

Human subjects: All authors have confirmed that this study involves human participants and relevant ethical clearance was obtained from IRB Board, Saveetha Medical College.

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