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Study of incidence of jaundice in neonates: A single Centre study from Agra Uttar Pradesh

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Abstract
Background: Neonatal jaundice affects every second infants globally. Jaundice is the result of an accumulation of bilirubin due to immature neonate liver. High serum levels of bilirubin cause lethargy, poor feeding and kernicterus of the neonate.
Aims and objectives: To study the prevalence of jaundice in neonates.
Materials and Methods: Seven hundred and eighty two neonates were studied at the maternity ward of Taj Hospital and Dental clinic Agra Uttar Pradesh from May 2018 to May 2019. Serum bilirubin level was estimated in all the neonates.
Results: Out of 782 newborns, 355 (45.39%) infants developed clinical jaundice. Of this 355, 216 (60.84%) developed the physiological jaundice and 139 (39.15%) had non-physiological jaundice needing therapeutic intervention.
Conclusion: Incidence of jaundice is high among the neonates mainly the physiological jaundice.

Keywords: neonatal jaundice, incidence, bilirubin

Introduction
Jaundice refers to the yellow-orange discoloration of the skin and sclera due to excessive presence of bilirubin in the skin and mucous membranes. Neonatal jaundice has very high incidences with 60% presence in term babies and up to 80% in premature babies [1, 2].
Neonatal jaundice is the result of imbalance between bilirubin production and conjugation, which increases the bilirubin levels. This imbalance is primarily due to the immature liver of the new born and the fast breakdown of red blood cells. At bilirubin levels of between 85 µmol/L and 120 µmol/L, neonatal jaundice can be diagnosed clinically [3].
The main risk factors identified for neonatal jaundice include prematurity and neonatal sepsis. In physiological jaundice, it is only the unconjugated bilirubin levels that are raised, because of immaturity of the liver in the absence of any other illness. In pathological jaundice, there are underlying conditions that either increase the production of bilirubin or decrease the excretion. In order to treat pathological jaundice, the underlying conditions must be treated [4].
Understanding the incidence and width of the problem will help the health care professional to prepare the recommendations for the management of neonatal jaundice. Hence, in present study we tried to assess the incidence of neonatal jaundice.

Materials and Methods
Current prospective was conducted on 782 newborns at the maternity ward of Taj Hospital and Dental clinic Agra Uttar Pradesh from May 2018 to May 2019. An informed and written consent from the parents of newborn and college authority was secured before commencement of this study.
All new born and postnatal ward neonates with clinical jaundice regardless of their gestational age and weight were included. Babies with major congenital malformations or who expired before complete evaluation during the period of hospital stay were excluded from this study.
A predesigned proforma and checklist was administered for the enrollment process. Significant hyperbilirubinemia was defined as the value of bilirubin according to American Academy of Pediatrics (AAP) guidelines in term neonates and Cockington's charts in preterm, above which phototherapy or exchange transfusion or both are required. Clinical jaundice is defined as the visible yellowish discoloration of skin of neonate in day light [5].
Non-physiologic jaundice was recorded in case of the onset of jaundice occurs within 24 hrs of age or elevation of serum bilirubin which requires phototherapy or increase in serum bilirubin level at the rate of 0.2mg/dl/hour or signs of any underlying sickness like vomiting, lethargy, poor feeding, excessive weight loss, tachypnea or temperature instability or if jaundice continued even after 8 days in a term infant or after 14 days in a premature infant.
Descriptive data are presented as number and percentages. Chi-square test was used to assess the association between neonatal jaundice with various factors. Microsoft word and SPSS software were used for the analysis of the results. A p value of 0.05 or less was considered for statistical significance.

Result
We have observed and examined 782 neonates based on the inclusion criteria at the maternity ward, out of them 355 i.e. 49% neonates had been suffered from clinical jaundice. Further 216 i.e. 61% of 355 newborns developed the physiological jaundice. During this study recorded prevalence of non-physiological jaundice among 782 subjects was 20%.

Neonates with clinical jaundice further developed various forms of jaundice, 139 of 355 recorded with pathological jaundice. Out of these 139 neonates with pathological jaundice, 67 were recorded with breast feeding jaundice and 22 developed ABO incompatibility. Of this 10 infants were preterm, 8 infants recorded with cephalohematoma, 7 new borns had Rh incompatibility, and in case of 7 newborns a history of sibling death was recorded. For 5 newborns a history of birth asphyxia was recorded, of this 5 infants were born to mothers with history of GDM, 4 neonates developed the sepsis, mother of 1 newborn was with history of hypothyroidism and 1 newborn was born to mother suffering from the TORCH infection.

Gender was an important factor with clear influence on the prevalence of non-physiological jaundice among the newborn, this study records that 94 males infants i.e. 67% of 139 had higher incidence compared to 45 females infants i.e. 33% of 139 had incidence of jaundice.

Out of 139 babies with pathological jaundice, 7 newborns had Rh incompatibility, 22 newborns had ABO incompatibility and 1 newborn had both Rh and ABO incompatibility.

Discussion

Current study recorded the 49% prevalence of clinical jaundice in the study cohort of 728, which is similar to the study done by Kumar RK in 1999, who found jaundice as the most common condition requiring medical attention in newborn infants. About 50 percent of term and 80 percent of preterm infants developed jaundice in the first week of life [6].

Anil Narang *et al*. in study at Nehru hospital, Chandigarh, recorded that of 3791 live births, 551 (14.5%) developed neonatal jaundice needing therapeutic intervention, i.e., either phototherapy or exchange transfusion. Current study has overall incidence of non-physiological jaundice is 19% (139 out of 355) [7].

In a study from Chandigarh done by Narang *et al*, incidence of hyperbilirubinemia in males was 64.2%. [7] In another study done at Delhi by Singhal *et al*, incidence of hyperbilirubinemia in males was 56.8%. Significant male cases was recorded in our study male being 67% vs. female babies with 33% in non-physiological jaundice, this variation could be due to various factor like genetics, mother history etc [8].

Current study observed the most common cause of jaundice was breast feeding jaundice 68 i.e. 48%, second commonest cause was ABO incompatibility which was 22 i.e. 16% and third most cause was prematurity i.e.10 infants born pre-term. In a similar study one by May-Jen Huang *et al*., similar pattern of distribution has been recorded [9].

Present study observed that the non-physiological have majorly breastfeeding jaundice cases, which is similar to the findings of the study of Osborn LM *et al*, which found that breastfed newborns may be at increased risk for early-onset exaggerated physiologic jaundice because of relative caloric deprivation in the first few days of life [10].

In similar study by Schneider AP, it was recorded that the decreased volume and decreased frequency of feedings may result in mild dehydration and the delayed passage of meconium. Compared with formula-fed newborns, breastfed infants are three to six times more likely to experience moderate jaundice (total serum bilirubin level above 12 mg per dL) [11].

Present study records that the ABO incompatibility with 16% is the second most common reason of non-physiological jaundice in infants. Sarici SÜ *et al.* in similar study recorded that there was a 14.8% prevalence of ABO incompatibility, with 21.3% of these babies exhibiting significant hyperbilirubinemia and 4.4% exhibiting severe ABO hemolytic disease [12].

Prematurity was third most common cause in our study with 5% infants born preterm. Preterm newborns are susceptible to jaundice due to immaturity of bilirubin conjugating system, higher rate of hemolysis, increased enterohepatic circulation, decreased caloric intake. Onyearugha *et al.* concluded prematurity as the second leading cause of neonatal jaundice [13].

Conclusion

Incidence of neonatal jaundice is high. Present study concludes that the leading cause of non-physiological jaundice is breastfeeding jaundice followed and ABO incompatibility and prematurity. Physiological jaundice contributes maximum number of cases among total cases.

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