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RESEARCH ARTICLE

THE PREVALENCE AND RISK FACTORS FOR HYPERBILIRUBINEMIA IN NEONATES

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Abstract

Background: Jaundice is very common in the neonatal period of life especially hyperbilirubinemia>12 mg/dl. Although it is not a major cause of mortality, it is an important cause of morbidity. So, assessment of the prevalence and risk factors of neonatal jaundice is very important.

Objectives: The objectives of the study were to estimate the prevalence,to identify the risk factors and to findout the association between hyperbilirubinemia with selected neonatal,maternal,environmental and socio demographic variablesand to identify the risk factors.

Methodology: This descriptive cross sectional survey study was conducted among 200 neonates of 37 completed weeks of gestation. Subjects were selected by using total enumerative sampling.Transcutaneous bilirubin was measured by bilirubinometer,clinical and demographic variables collected by using semi structured questionnaire and the risk factors were assessed by interview schedule.

Results:Research showed that most of neonates (81.5%) had Transcutaneous bilirubin level more than 12mg/dl, out of that (15%)subjects had elevated level of bilirubin 15- 20mg/dl. It is concluded that there is high prevalence of hyperbilirubinemia among neonates . It is evident that neonates developed hyperbilirubinemia by 48 to 72 hours. It is inferred that prevalence of hyperbilirubinemia was high at 72 hours (56.5%) after birth compared to 48 hours of birth (38%). There was a significant association between level of hyperbilirubinemia and family history of genetic diseases (P=0.003),parity (p=0.03, $\chi 2$=4.37),mode of conception(p=0.012, $\chi 2$=6.37), and gestational age(P=0.04),gender of the neonate (p=0.004, $\chi 2$=8.1)and duration of second stage of labour (p=0.026, $\chi 2$=7.27). The study revealed that the family history of genetic diseases (p=0.004),(OR=0.09) at level of significance 0.05,is a risk factor leads to hyperbilirubinemia.

Conclusion: Neonatal jaundice is a leading cause of hospitalisation in the first few weeks of life throughout the world.Though major complications may arise like kernicterus,encephalopathy and neural sequlae.Hence there is an exigent need for assessing the bilirubin value in the routine neonatal assessment.

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Introduction:-

Hyperbilirubinemia is the most common condition in newborns that requires medical attention. About 50% to 70% of term babies and 80% of preterm babies develop hyperbilirubinemia in the first week of life. Neonatal hyperbilirubinemia is a major problem globally, especially in the Asian and south-east Asian regions. Hyperbilirubinemia usually appears 2 to 4 days after birth and resolves 1 to 2 weeks later without the need for treatment[8].Of the 7.6 million deaths estimated to occur in children below the age of 5 years in 2010, 40% occurred during the neonatal period[3].

In most cases, the etiology of this disorder is multifactorial. Several factors must be considered before treatment is begun in icteric new borns. First, it is important that the obstetric history of the mother and delivery be analyzed to allow identification of the factors that may be contributing to the occurrence of hyperbilirubinemia, such as drugs taken by the mother (diazepam, oxytocin), type of delivery (forceps, pelvic, caesarean section), delay in umbilical cord clamping, blood type, Rh factor, and maternal Coombs' test[1].

The sheer prevalence of neonatal jaundice and periodic occurrence of bilirubin associated complications like encephalopathy ensures sustained interest on this subject. The study aims to find out the prevalence and risk factors of neonatal jaundice and also the study had made efforts to find out whether any maternal factors have an effect on the occurrence of jaundice. As the rate of jaundiced babies are increasing day by day, it is important to study about the factors influencing jaundice and management outcomes to improve the understanding of jaundice among mothers. Unconjugated bilirubin is neurotoxic and can cause death in newborns and lifelong neurologic sequelae in infants who survive (kernicterus). The incidence of neonatal jaundice is increased in infants of East Asian, American Indian and Greek descent. Neonatal jaundice first visible in the face and forehead, gradually become visible on the trunk and extremities[7].

This study is being conducted to ascertain the various risk factors of neonatal jaundice in term neonates. The aim of the study is to find out the risk factors of hyperbilirubinemia in neonates admitted in a tertiary care hospital at Ernakulum district.

Objectives:-

To estimate the prevalence of hyperbilirubinemia in neonates
To find out the association between prevalence of hyperbilirubinemia with selected neonatal, maternal, environmental and socio demographic variables
To identify the risk factors of hyperbilirubinemia in neonates

Methods:-

The study was conducted at neonatal care units of Malankara Orthodox Syrian Church Medical College Hospital, Kolenchery in Ernakulam district of Kerala state. The population comprised of the Neonates born after 37 weeks of gestation. Researcher selected all the neonates who met inclusion criteria, during the 6 weeks period of data collection. In this study, sample size consists of 200 neonates, and they were assessed for risk factors.

Inclusion criteria:-

Neonates born after 37 weeks of gestation
Neonates admitted in MOSC Medical College Hospital

Exclusion criteria:-

Neonates whose mothers were not available
Neonates who were critically ill.

Tools and techniques:-

Semi structured questionnaire were prepared to assess the socio demographic data, and clinical variables of neonate and clinical variables of mother. Socio demographic data consisted of 17 items including age, sex, religion, type of family, area of residence, education of father and mother, occupation of father and mother, age of father ,age of mother, type of family, family income, habits of father, habits of mother and type of marriage. Fourteen items were

used to collect clinical data of the neonates. Investigator collected data from the patient‟s hospital record and by interviewing mother. Items included were gestational age, birth weight, apgar score, blood group of neonate, time of initiation of feed, method of feeding, pattern of feeding, time of passage of meconium, pattern of bowel and bladder movements, occurrence of complications, and presence of birth injuries. Investigator collected data from mothers hospital record regarding clinical details. Fourteen items were used to collect clinical data. Blood group of mother, weight of mother, mode of delivery, parity, gravida, number of children, obstetric complications of mother, pregnancy related problems, duration of labour, and history of induction of labour. A data sheet was prepared by investigator based on the review, to record TcB. TcB values were recorded with 12 hours interval from 24 hours,36 hours,48 hours,72 hours and after 72 hours. The prevalence of hyperbilirubinmia was assessed using frequency and percentage. An interview schedule was developed by the investigator to collect risk factors of hyperbilirubinemia. It consisted of 26 items with options including maternal, neonatal and environmental variables.

Results:-

Research showed that most of neonates (81.5%) had Transcutaneous bilirubin level more than 12mg/dl, out of that (15%)subjects had elevated level of bilirubin 15- 20mg/dl. It is concluded that there is high prevalence of hyperbilirubinemia among neonates. The study revealed that the family history of genetic diseases (p=0.004), (OR=0.09) at level of significance0.05, is a risk factor leads to hyperbilirubinemia.

Discussion:-

In the present study level of hyperbilirubinemia assessed by using transcutaneous bilirubinometer showed that, most of neonates (81.5%) had Transcutaneous bilirubin level more than 12mg/dl, out of that (15%) subjects had elevated level of bilirubin 15- 20mg/dl. And it is also evident that majority (87%) of neonates developed transcutaneous bilirubin level more than 10mg/dl. it is concluded that there is high prevalence of hyperbilirubinemia among neonates.

Level of hyperbilirubinemia according to hours after birth, only two percent had hyperbilirubinemia at 24 hours of life which is peaked by 72 hours after birth (56.5%). It is evident that neonates developed hyperbilirubinemia by 48 to 72 hours. It is inferred that prevalence of hyperbilirubinemia was high at 72 hours (56.5%) after birth compared to 48 hours of birth(38%).

A prospective study among 1238 full-term Chinese newborn infants was conducted to determine the incidence of neonatal jaundice and associated factors. Among that, clinical jaundice was present in 87% and 23.9% had a peak serum bilirubin (SB) concentration. This study supports the present research project, due to fact that subjects were term neonates, and setting was clinical setting.

Present study revealed that There was a significant association between level of hyperbilirubinemia and family history of genetic diseases (P=0.003) at 48 hours of life. At 72 hours of life there was significant association between hyperbilirubinemia and parity (p=0.03, $\chi 2$=4.37), mode of conception (p=0.012, $\chi 2$=6.37), and gestational age (P=0.04). There was a significant association between level of hyperbilirubinemia and sex of the neonate (p=0.004, $\chi 2$=8.1) and duration of second stage of labour (p=0.026, $\chi 2$=7.27) after 72 hours of life.

In the similar study, factors that were found to have no significant association with the peak serum bilirubin concentration were: gestational age; birth weight; the mode of delivery of the infants; maternal consumption of Chinese herbs and syntocinon induction or augmentation of labour

In this study we found out that, the following risk factors leads to hyperbilirubinemia such as family history of genetic diseases (p=0.002), (OR=0.07) at 48 hours (p=0.004), (OR=0.09) at 72 hours of life . A study conducted on Factors affecting neonatal jaundice reported, three factors epidural analgesia, breast feeding, and poor weight recovery showed highly significant associations with jaundice.

Conclusion:-

The findings of the research study can be utilized for early recognition and adequate management to prevent the crippling complications like kernicterus and other abnormal psychomotor and neurological sequelae due to hyperbilirubinaemia. Assessment of the causes and risk factors is of paramount importance for adequate

management. The study signifies the need of assessment of bilirubin. Hence there is an exigent need for assessing the bilirubin value in the routine neonatal assessment.

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