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Full Length Research

Prevalence and management of neonatal jaundice in a hospital, Jos-Nigeria

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ABSTRACT: Neonatal jaundice (hyperbilirubinemia) is one of the most common conditions that require medical attention in neonates. The medical condition is because of the imbalance between bilirubin production and its excretion. The accumulation of serum bilirubin in excess, elevates the values of bilirubin in neonates up to a high concentration as noted in the medical laboratory assay causing the yellowish colouration of skin and the eye. A retrospective study was carried out in OLA hospital from 2019 t0 2021 for neonates delivered within the period. The incidence of neonatal jaundice (hyperbilirubinemia) in this study was 11.7%. The most common risk factor associated with neonatal jaundice (hyperbilirubinemia) is ABO incompatibility, Preterm gestation and low birth weight (<2.5kg). Neonatal jaundice (hyperbilirubinemia) is a common problem encountered in Neonatal Intensive Care Units of hospitals as seen in OLA Hospital in Jos. The recommended strategies that is involve in the prevention and control of neonatal jaundice include; health education on neonatal jaundice, identification of risk factors, early detection of neonatal jaundice, proper assessment of babies with neonatal jaundice and early referral for good medical management.

Keywords: Jaundice, Jos-Nigeria, neonatal, prevalence.

INTRODUCTION

Neonatal jaundice is also referred to as neonatal hyperbilirubinemia, this condition in neonates results from a high total serum bilirubin (TSB) and is clinically manifested as a yellowish colouration of the skin, eyes, and mucous membrane. The term jaundice was derived from the French word "jaune," which means yellow. Neonatal Jaundice occurs when bilirubin builds up in the neonate's blood, hyperbilirubinemia is the medical term for this condition. Bilirubin is a yellowish substance the body produces when red blood cells are breakdown. During pregnancy, before babies are given birth to, the maternal liver helps in removing bilirubin for the neonates, but after birth, the neonate's liver must begin to get rid of excess bilirubin on its own. If the neonate's liver is not developed enough, it may not be able to get rid of the excess bilirubin, at this point the accumulation of excess bilirubin builds up, and the neonate's skin appears yellowish due to the inability of the liver to get rid of the excess bilirubin accumulated. Neonatal jaundice is the most commonly encountered medical problem in the first two weeks of life and a common cause of re-admission to the hospital after birth (Mitra and Rennie, 2017).

Approximately 60% of term and 80% of preterm neonates develop clinical jaundice in the first week after birth. In most cases, neonatal jaundice is mild, transient, and a self-limiting condition and resolves without treatment, this is referred to as a "physiological jaundice." However, it is good to distinguish this from a more severe form called "pathological jaundice." Failure to identify and treat this entity may result in bilirubin encephalopathy and associated neurological sequelae (Owa *et al*., 2011; Iacob *et al*., 2011).

Neonatal jaundice results from red blood cell breakdown (Hemolysis), liver disease, infection, hypothyroidism, or metabolic disorders (pathologic). In neonates, a bilirubin level more than 34 µmol/l (2 mg/dL) may be visible, in otherwise healthy neonate's bilirubin level occurs when bilirubin levels are greater than 308 µmol/L (18 mg/dL), neonatal jaundice is noticed in the first day of life and there is a rapid rise in bilirubin levels, neonatal jaundice lasts more than two weeks (Dysart, 2021). Multiple risk factors contribute to severity of neonatal jaundice which if untreated can lead to adverse neurological outcomes (Wan *et al*., 2016). Neonatal jaundice could be physiologic or pathologic, however, Rh factor hemolytic disease, ABO incompatibility and Glucose 6 Phosphate Dehydrogenase deficiency are of great risk in the condition (Bosschaart *et al*., 2012).

Hence, this study aimed at discovering the prevalence of neonatal jaundice in a Jos hospital, identification of types of neonatal jaundice recorded with possible causes and understanding the management given in neonatal jaundice cases in Jos, Nigeria.

MATERIALS AND METHODS

This retrospective study was carried out in Our Lady of Apostle Hospital (OLA) Jos north, plateau state. All the data of live born neonates delivered in OLA hospital in the year 2019, 2020 and 2021 were collected. The data were obtained from the hospital's register on neonates treated for neonatal jaundice (hyperbilirubinemia) in the periods of the year 2019, 2020 and 2021. The neonates were predominantly treated with phototherapy and a small minority required exchange blood transfusion due to severe cases of pathologic neonatal jaundice. Neonates history including gestational age, gender, birth weight, mode of delivery, and mode of treatment of neonatal jaundice were noted. The physical examination findings revealed in the presence of Neonatal scalp swelling (cephalohematoma) or suspicion of sepsis was noted. Results of the investigations includes; blood group and Rh type of mother and neonate, serum bilirubin levels, coombs test, retic count, peripheral smear, were collated and considered to determine the etiology and risk factors of Neonatal jaundice.

Data analyses

The data was analyzed in percentages and presented.

RESULTS

In this present study, live births over the three years period were 1,580 while 185 of the neonates had jaundice were treated for neonatal hyperbilirubinemia. This is shown on Table 1. The incidence of hyperbilirubinemia/jaundice in this study is 11.71%. ABO incompatibility was the most common cause, in nearly half of the causes but nearly one tenth was not known, 16.2% of the treated neonates were diagnosed with sepsis. 18.9% had Rh incompatibility and neonatal cephalohematoma was present in 10.8% as shown in Figure 1. There is male preponderance of 111 to 74 of females given a sex ratio of 1.5:1 and two thirds were term neonates. Low birth weight (46%) and very low birth weight (54%) was observed in of neonates. 100 neonates (54%) were delivered vaginally and 85 neonates (46%) were delivered by caesarean section. The factors associated with hyperbilirubinemia and the modes of treatment is shown on Table 2 and Table 3 respectively.

DISCUSSION

In this present study, the total number of live births in 2019, 2020 and 2021 were 1580, and 185 neonates were treated for neonatal hyperbilirubinemia/jaundice. This is shown on Table 1. The incidence of hyperbilirubinemia in this study was 11.71%. Greco *et al*. (2016) provided a prevalence up to 26.9% in Nigeria during their review. However, Olusanya *et al.* (2016) posits that there is little improvement in the reduction in the prevalence of neonatal jaundice based on the incidence. This study provides a prevailing prevalence of Neonatal jaundice in Jos, Nigeria. Among the 185 treated neonates, males slightly outnumbered females. The gender dominance of males has been seen in some studies in Nigeria (Udo *et al.,* 2008; Okechukwu *et al*., 2009) and there is a need to substantiate the gender difference in neonatal jaundice studies. The discoveries in this study based on the factors associated with hyperbilirubinemia is shown in Table 2 are not far from other studies carried out in Nigeria (Owa and Osinaike, 1998; Etuk *et al*., 2000; Eneh and Ugwu, 2009).

In this study, as of the year 2019, 76 neonates were treated of neonatal hyperbilirubinemia using phototherapy and 4 neonates were treated by exchange blood transfusion, in the year 2020, 50 neonates were treated by phototherapy and 10 neonates were treated using exchange transfusion, and in the year 2021, 35 neonates were treated using phototherapy and 10 neonates were treated using exchange transfusion mode of treatment.

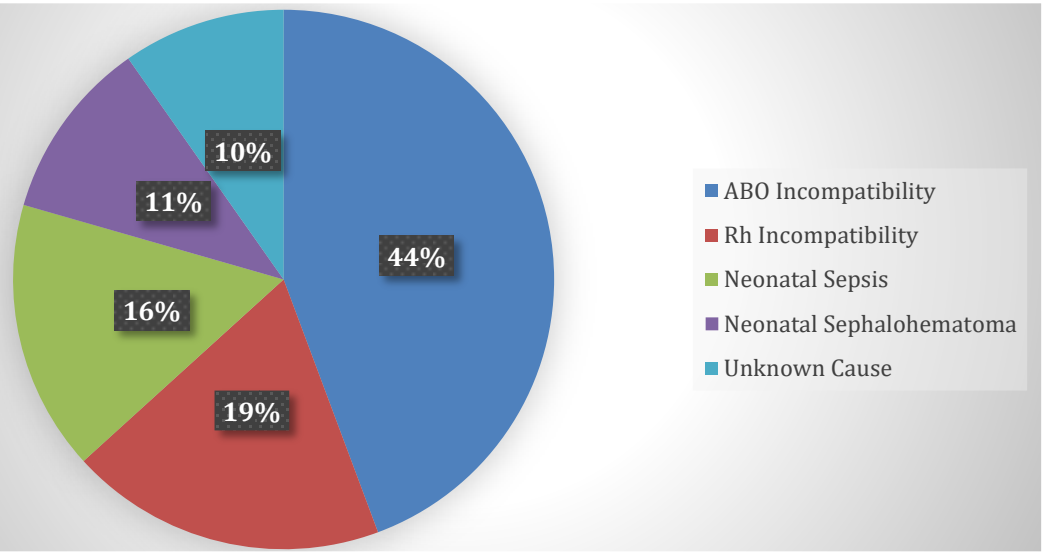

Figure 1. A chart showing causes of neonatal jaundice under study.

Table 1. Total live births and neonates treated for neonatal jaundice in years under study.

Year	Number of live births per year	Neonatal jaundice	Percentage jaundiced (%)
2019	500	80	43.2
2020	630	60	32.5
2021	450	45	24.3
Total	1580	185	100.0

NB: The overall prevalence of neonatal jaundice in the study from the above table shows 11.7%

Table 2. Factors associated with unconjugated neonatal hyperbilirubinemia.

Parameters	Factors associated	Numbers	Percentage (%)
Genders	Male	111	60
	Female	74	40
Gestational age	Term	120	65
	Preterm	65	35
Birth weight	Low birth weight	85	46
	Very low birth weight	100	54
Mode of delivery	Normal vaginal delivery	100	54
	Caesarean section	85	46

Table 3. Modes of treatment of neonatal hyperbilirubinemia.

Year	Phototherapy	Exchange blood transfusion
2019	76	4
2020	50	10
2021	35	10

This confirms that phototherapy is majorly used to manage neonatal jaundice in Jos and Nigeria at large as seen in Ugwa *et al*. (2006), Ojukwu *et al*. (2006), and Omoigberal *et al.* (2010)

In Figure 1 ABO incompatibility was the most common cause, in nearly one third, the cause was not known, 16.2% of the treated neonates were diagnosed with sepsis. 18.9% had Rh incompatibility and neonatal scalps (cephalohematoma) was present in 10.8%. These observations are similar to the results of other studies like Ugwa *et al.* (2006). The prevalence of neonatal jaundice (hyperbilirubinemia) in a study carried out in the year 2018 (Shetty and Kumar, 2018) was 13.47% and as well, a study carried out in Kahramanmaraş, Turkey shows that ABO incompatibility was the most common cause of neonatal jaundice/hyperbilrubinemia (Davutoğlu *et al*., 2016).

Conclusion

The incidence of neonatal hyperbilirubinemia in this study was 11.7% and this indicates that, neonatal jaundice (hyperbilirubinemia) is a common problem encountered in Neonatal Intensive Care Units and Hospitals. The most common risk factor associated with unconjugated neonatal hyperbilirubinemia was ABO incompatibility. Nearly a third of the cases had no attributable cause or associated risk factor to the limit of our laboratory standard. Preterm gestation and low birth weight (<2.5 kg) also showed a strong association with neonatal hyperbilirubinemia.

Recommendations

This study further recommends that for good neonatal jaundice management in Jos, some strategies which should be given attention may include;

1. Antenatal and postnatal strategies listed below should be encouraged:
    - Health education on neonatal jaundice.
    - Identification of risk factors.
    - Early detection of neonatal jaundice.
    - Proper assessment of babies with neonatal jaundice.
    - Early referral as indicated.
2. In the cases of late preterm, Glucose 6 Phosphate dehydrogenase deficiency and isoimmune haemolytic disease (ABO and Rhesus incompatibility) are the important risk factors for developing severe neonatal jaundice. This calls for lower thresholds of phototherapy.
3. All neonates should be screened for G6PD at birth. If G6PD is deficient, neonates should be admitted and monitored for neonatal jaundice during the first 5 days of life. If they were discharged earlier, they should be followed-up closely.
4. Breastfeeding should be encouraged and adequate lactation support should be provided to all mothers.
5. Pre-discharge screening in hospital using Transcutaneous Biluribinometer (TcB) may be considered.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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