Epidemiological aspects of neonatal jaundice and its relationship with demographic characteristics in the neonates hospitalized in government hospitals in Ilam, 2013

Ashraf Direkvand-Moghadam [1], Ali Delpisheh [2], Mosayeb Mozafari [*3], Azadeh Direkvand-Moghadam [4], Parvaneh Karzani [4], Parvin Saraee [4], Zahra Safaripour [4], Nasim Mir-Moghadam [4], Mrjan Teimour Pour[4]

1. Prevention of Psychosocial Injuries Research Center; Department of Midwifery, Ilam University of Medical Sciences, Ilam, Iran
2. Department of Clinical Epidemiology, School of Medicine, Ilam University of Medical Sciences, Ilam, Iran
3. Department of Nursing and Midwifery, Ilam University of Medical Sciences, Ilam, Iran
4. Student Research Committee, Ilam University of Medical Sciences, Ilam, Iran

[*] **Corresponding author:** Tel: +98 8412227123; fax: +98 8412227123
Address: Dept of Nursing and Midwifery, Ilam University of Medical Sciences, Ilam, Iran
E-mail: mozafaric@yahoo.com
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Abstract

Introduction: Jaundice is one of the hospitalization causes in term and preterm infants. Considering to the side effects of jaundice, the present study aimed to investigate the prevalence and risk factors associated with jaundice in neonates hospitalized in government hospitals in Ilam.

Materials and methods: In a case - control study, 384 neonates were enrolled. All neonates hospitalized in Mustafa Khomeini and Imam Khomeini hospital were enrolled in the study. Neonates' deaths due other causes were excluded from the study. Data collected through a questionnaire. The validity of the questionnaire was determined using content validity and its reliability was determined 84% using Cronbach's alpha coefficient. In this study, neonates were divided into two groups, the jaundice and other causes neonates. Data analysis was performed using descriptive statistics and inferential statistics. $P< 0.05$ was considered significant.

Results: In this study, 44.8% of all neonates have jaundice. Fisher's exact test showed a statistically significant difference of mother's blood group between the two groups .Gender, neonatal age, birth weight, gestational age, type of delivery, type of anesthesia, cephalhematoma and TSH levels was statistically differences between groups. But the caput succedaneum and G6PD levels were not significantly different between groups.

Conclusion: The identification of risk factors before and during childbirth and its complications are important in the prevention of neonatal jaundice. Prevent preterm births; hypothyroidism and PROM the risk factors can be controlled by the health service providers.

Keywords: Birth weight, G6PD levels in newborns, gestational age, mode of delivery, TSH levels in newborns

Introduction

Jaundice is one of the most important causes of mortality in the first week of life. This disorder remains the most common cause of hospitalization among health and premature newborns (1-3). Neonatal jaundice is common (4-9) and occurs in 60% of term and 80% of premature neonates (10, 11). Neonatal jaundice is defined as total bilirubin levels greater than 5 mg/ deciliter (86 micromoles/ liter) (12).

Risk factors for neonatal jaundice are included; maternal diabetes, prematurity, race, drugs, height above sea level,

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polycythemia, male sex, trisomy, cephalohematoma, breast feeding, weight loss, type of delivery, delayed meconium excretion and family history of jaundice (13). ABO Inconsistency, congenital infections such as Syphilis, Rubella, CMV, Toxoplasmosis years are other factors that can contribute to the worsening of jaundice. However, in some cases, jaundice may occur without any particular cause (14).

Newborns Jaundice is divided into two groups: physiologic jaundice and pathologic jaundice. Physiological jaundice in newborns is caused as a result of increased bilirubin production, increased red blood cell mass and short-lived red blood cells. Physiologic jaundice begins in the second or third day of life and its peak occurs about the fourth or fifth day of life. Physiological jaundice is very common and usually harmless and is not associated with any disease (12). Jaundice is more likely in the first week of life in infants who are breastfed. This may be caused due to receiving fewer calories and increase the Entero -hepatic circulation of bilirubin. Non-conjugated jaundice is defined as prolonged jaundice remains beyond the second week of life. The jaundice is seen in infants fed breast milk. The mechanism of breast milk jaundice syndrome is still not completely understood (15).

The purpose of diagnosis and treatment of neonatal jaundice, is remove the pathologic causes of hyperbilirubinemia and early treatment to prevent neurological toxicity.

Kernicterus is an important adverse outcome of neonatal jaundice and refers to the neurological consequences of non-conjugated bilirubin deposition in the brain (16). However, the role of bilirubin in Kernicterus is not exactly known. An important increased of infant's Kernicterus has been showed in the 1990s in compared to the previous decade. Early discharge from the hospital, insufficient follow-up and reduce the awareness of the symptoms of severe jaundice can explain the main causes of increasing of Kernicterus (17). Due to serious and irreparable effects of pathological jaundice on the health of infants, identify the frequency and causes of neonatal jaundice appears necessary in any society. Therefore, the aimed of the present study investigated the prevalence of and risk factors for neonatal jaundice in hospitalized neonates in Ilam during 2013.

Materials and methods

This research was a cross-sectional study that was done on one 384 newborn and infant hospitalized in the newborn wards of Imam Khomeini and Mustafa hospitals (two educational hospitals) in Ilam- Iran, from December to March 2013. The Ethics Committee of Ilam University of Medical Sciences approved the study design.

Sample size was determined by P=0.5, d=0.05 and confidence interval 95%.The newborn were selected by the simple random sampling method. Data gathered using questioner that its validity was obtained using the content validity. Reliability of the questionnaire was checked using Cronbach Alpha coefficient and was estimated to be about 84 %. Data was collected by a trained research midwife.

In this study, infants who had jaundice tests and clinical examination, considered as the case group and infants who were hospitalized for other reasons, were considered as a control group.

Mean± SD, median and percentages were used to describe the data. When a normal distribution of continuous data was not assumed, Mann–Whitney correlation was used to analyze the correlation between different variables. Categorical variables were analyzed by x2 analysis of 3×2 contingency tables or by Fisher's exact test as appropriate, followed by a similar analysis by 2×2 tables for differences within the groups. SPSS software Package 16 was used to analyze the data of this project.

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Results

A total of 384 newborns were studied. In this study ,44.8% of all neonates have jaundice. The Distribution of absolute and relative frequency of the neonate's hospitalization is presented in table 1. The frequency of jaundice type is presented in the figure 1.

Table 1. The distribution of absolute and relative frequency of the neonate's hospitalization in government hospitals.

Cause of admission	N (%)
Respiratory distress	84(21.8)
Fever	23(6)
Preterm	67 (17.4)
Poor sucking	19(5)
Blister	19(5)
Jaundice	172(44.8)
Total	384(100)

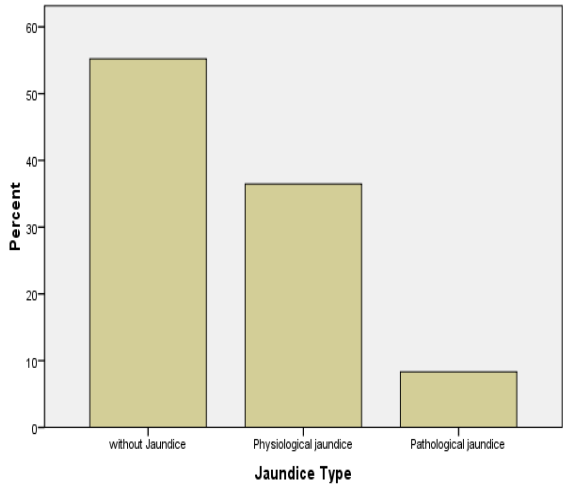


Figure 1. The frequency of jaundice type in the neonates hospitalized in government hospitals in Ilam, 2013.

Most mothers in both groups had A^+ blood group. Fisher's exact test, showed a statistically significant difference in mother's blood group between the two groups (P=0.004). There was a significant difference in the history of jaundice in the previous child in the family between the two groups (P=0.000).

The results reported a positive correlation between the history of jaundice in the previous child and current neonatal Jaundice(r= 0.156). In the present study, Cephalhematoma and Caput succedaneum were evaluated as two injuries during delivery. Cephalhematoma was observed in 19 cases. Chi-square test showed a relationship between Cephalhematoma and neonatal jaundice (P=0.000). But there were not statistically significant differences between the Caput succedaneum and the risk of neonatal jaundice (P=0.528).

Kolmogorov-Smirnov test showed no normal distribution of TSH levels in hospitalization neonates. Therefore, the Mann-Whitney U test was used. The test results showed a significant difference in TSH levels between the two groups (P=0.000). Based on the results 5.5% of all newborns have abnormal levels of G6PD. All infants with abnormal levels of G6PD were in jaundice group. The Fisher's exact test, showed no significant difference in the level of G6PD between the two groups (P=0.220). Gender, neonatal age ,birth weight ,gestational age ,type of delivery , type of anesthesia was statistically differences between groups (P=0.000).

Discussion

In the present study, the prevalence and risk factors associated with neonatal jaundice has been studying in newborns hospitalized in public Ilam hospitals. Because the participants in the study were selected among infants hospitalized in the neonatal ward of two government hospitals, therefore, we can say that the results are generalizable to the entire population of the survey sample. Since the present study evaluated only the hospitalized newborns, so the status of outpatient infants is not known. This is a limitation of the current study.

Based on the results of the present study, 40.6% of the infants were hospitalized only due to jaundice. In an African research, jaundice was the causes of 17% neonatal hospitalizations of and 24 % of neonatal death (18). The present results indicate that the family history of newborn jaundice increases the risk of jaundice.

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Another study is consistent with current research, and reported the history of jaundice in the family as a risk factor for neonatal jaundice (13).

The results of the present study showed that the risk of neonatal jaundice is higher in mothers with A^+ blood group Lavanya et al reported the highest risk of jaundice in maternal with O blood group (19).

In the present study, there was a relationship between mode of delivery and neonatal jaundice. In consistent with our results, Tamook et al reported the higher prevalence of newborn jaundice in cesarean delivery in comparing with vaginal delivery (20). The scientific sources have confirmed the effect of type of delivery on neonatal jaundice (21). On the other hand, it is important to note that some of the prenatal complications that lead to jaundice are indications performed of cesarean section, therefore it is possible that the cesarean section alone does not play a role in the occurrence of jaundice (22).

In the present study, were reported a significant association between birth weight and gestational age with neonatal jaundice. A study has shown the relationship between premature birth and neonatal jaundice (23).

In the present study there was a significant difference between the two groups in gender. The male gender is introduced as risk factors for neonatal jaundice (18). However, in another study, weren't reported a significant relationship between gender and the risk of neonatal jaundice (14).

Conclusion

The identification of risk factors before and during childbirth and its complications are important in the prevention of neonatal jaundice. The risk factors such as preterm births ;hypothyroidism and PROM can be controlled by the health service providers.

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