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## The prevalence of neonatal jaundice in the pediatric department of Abu Ali Sina Regional Hospital in Balkh during the year 2025

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### Abstract

Jaundice is a significant clinical issue and is common among newborns, especially in Asia and Southeast Asia. Almost all newborns experience a transient increase in serum bilirubin levels during the first week after birth, but only 60% of newborns exhibit noticeable jaundice. The present study is an applied research that utilizes the existing records of all newborns with jaundice at Abu Ali Sina Regional Hospital in Balkh during the year 2022.

**Sample Size** The sample size for this study consists of all children visiting the internal medicine and pediatrics departments. The sample size was randomly selected using Morgan's table and Cochran's formula, totaling 3,629 individuals. Data were collected from patient records and then entered into SPSS 27 for analysis. The findings indicated that out of the 3,629 individuals, 1,740 were male and 1,889 were female, constituting 48% and 52%, respectively. Among the 3,629 hospitalized newborns, 2,177 were diagnosed with jaundice, 762 were term infants, 1,394 were preterm, 25 had Kernicterus, 1,763 were classified as physiological jaundice, 28 had ABO incompatibility, 8 had Rh incompatibility, 413 were noted from a pathological perspective, and 217 newborns were diagnosed with sepsis.

**Keywords:** Jaundice, newborns, pathology, sepsis, preterm, Abu Ali Sina hospital in Balkh

### Introductions

Jaundice is a significant clinical issue and is common among newborns, especially in Asia and Southeast Asia. Almost all newborns experience a transient increase in serum bilirubin levels during the first week after birth, but only 60% of newborns exhibit noticeable jaundice. In approximately 8-11% of cases, bilirubin levels progress above the 95th percentile, requiring further evaluation and treatment. If jaundice is not treated appropriately, it can lead to serious complications such as kernicterus, resulting in lifelong disabilities.

Jaundice in newborns is one of the frequent and important issues addressed in health centers, especially in hospitals and neonatal departments. Abu Ali Sina Regional Hospital in Balkh, as one of the health centers in the northern region, holds special significance with a history of over decades of service to patients. This article examines the prevalence of jaundice in newborns at Abu Ali Sina Regional Hospital and aims to contribute to improving the status of newborns by conducting a thorough analysis of the current situation, identifying causes and influencing factors, and proposing solutions to reduce the prevalence of this issue in the hospital.

Jaundice in newborns has various causes. Many of us know that liver infections like hepatitis can lead to jaundice; however, there are other reasons in newborns. Therefore, jaundice in newborns is referred to as physiological jaundice. Approximately 60% of term infants and 80% of preterm infants experience jaundice in the first week of life; in most cases, there is no underlying disease, and this physiological jaundice is harmless (Woodgate *et al.*, 2011) [14]. The prevalence of jaundice in newborns is due to the fact that they produce more bilirubin compared to adults, as the developing liver of the newborn is not capable of effectively excreting bilirubin from the blood, leading to a high level of bilirubin being reabsorbed from the intestine before elimination (Sharif, 2014) [6].

Another predisposing factor for neonatal jaundice is maternal issues during pregnancy. In cases where the mother has diabetes, twins, or ruptured membranes, the likelihood of neonatal jaundice increases.

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## Types of Jaundice in Newborns

**Physiological Jaundice (Natural) and Its Types:** Physiological jaundice typically appears between the 2nd to 6th day after birth and usually resolves within the first or second week with parental monitoring.

**Jaundice Due to Insufficient Breastfeeding:** This type of jaundice arises from inadequate breast milk supply, as the mother does not make sufficient efforts to increase milk production, leaving the infant often hungry.

**Physiological Jaundice Due to Liver Inability to Excrete Bilirubin:** A newborn's liver may not have sufficient capability to excrete bilirubin, leading to its accumulation in the body, resulting in jaundice (Chee *et al.*, 2018) <sup>[9]</sup>.

**Physiological Jaundice Due to Prematurity:** If the duration of the infant's stay in the mother's womb is less than 37 weeks or if the infant is born weighing less than 2,500 grams, the infant is considered premature, which is one of the causes of jaundice (Shiva, 2014) <sup>[7]</sup>.

## Pathological Jaundice and Its Types

As explained above, jaundice on the first day of life is termed pathological, and its types are as follows:

**Pathological Jaundice Due to Blood Incompatibility:** Blood groups are divided into two categories: ABO and Rh. Each individual belongs to one of the groups A, B, AB, or O. The Rh factor is further divided into positive and negative groups. This type of jaundice occurs due to incompatibility between the mother's and the infant's blood groups, either ABO or Rh. For example, the risk of jaundice is higher in an infant with blood group A or B if the mother has blood group O (Fariba, 2007) <sup>[5]</sup>.

This jaundice occurs when the mother's and the infant's blood groups are different, leading the mother's immune system to produce antibodies against the infant, destroying the infant's red blood cells and resulting in a sudden accumulation of bilirubin in the infant's body. This jaundice manifests on the first day of life, and its prevalence is now under control.

**Pathological Jaundice Due to Blood Incompatibility:** This jaundice occurs when blood groups of the mother and the infant are incompatible, resulting in the mother's immune system producing antibodies against the infant, leading to the destruction of the infant's red blood cells and a sudden increase in bilirubin levels. This type of jaundice can be prevented by administering Rh immunoglobulin to the mother within 72 hours after delivery, thereby preventing the production of harmful antibodies (Seneadza, 2022) <sup>[11]</sup>.

**Pathological Jaundice Due to Infection:** This includes conditions such as sepsis and hepatitis.

**Prolonged Pathological Jaundice:** If an infant's jaundice persists for more than two weeks, it is classified as pathological and requires assessment by a relevant specialist (Maleki *et al.*, 2023) <sup>[8]</sup>.

**Pathological Jaundice Due to Favism or Polycythemia:** This type of jaundice appears in infants whose mothers have

diabetes, thyroid issues, or intrauterine growth restriction (IUGR), and it must be evaluated by a specialist (Kelly, 1995) <sup>[10]</sup>.

## Background of the Research

Hassan Baskabadi and colleagues (2015) investigated the complications of jaundice and its predisposing factors in newborns at Qaem Hospital (AJ) in Mashhad, Iran. This study was conducted on over 1,069 newborns. Initially, the newborns underwent a medical history assessment, physical examination, and necessary tests. They were then followed up at six months and one year of age based on the Denver Developmental Screening Test II to assess their developmental status. The newborns were categorized based on the occurrence of complications (acute kernicterus, chronic kernicterus, developmental disorders, or hearing impairment) and those without complications. and then the predisposing factors for the occurrence of these complications were examined. The findings indicated that out of 1,069 newborns with jaundice, 143 (13.37%) experienced complications. There was no statistically significant difference between the two groups of newborns with and without complications regarding age, gender, and maternal age; however, there was a significant difference in treatment type and mean total serum bilirubin levels (27 mg/dl vs. 32 mg/dl). The predisposing factors for the infants who experienced complications included: unknown causes (30.5%), ABO incompatibility (18%), Rh incompatibility (14.8%), G6PD deficiency (12.6%), and sepsis (3.3%).

Javadi and Mohsenzadeh (2005) <sup>[4]</sup> investigated the causes of jaundice in hospitalized newborns at Shahid Madani Hospital in Khorramabad. This descriptive-cross-sectional and prospective study was conducted using a convenient sampling method. The statistical population included all newborns diagnosed with jaundice non-physiological jaundice in 2003 at Shahid Madani Hospital in Khorramabad. The sample size consisted of 123 newborns. The variables examined included gender, age, positive family history, breastfeeding, maternal diabetes, and the onset time of jaundice. Based on whether the newborn was full-term or preterm, postnatal age, and blood bilirubin levels, treatment was provided through phototherapy or blood exchange. Necessary information was collected using a questionnaire and analyzed statistically using descriptive statistics. The findings revealed that out of the 123 newborns studied, 72% were male and 28% were female.

In terms of the causes of jaundice, 39.9% of the jaundiced newborns had breastfeeding jaundice of the early type, attributed to inadequate breastfeeding and reduced caloric intake. Additionally, 21.1% had ABO incompatibility, 2.4% had Rh incompatibility, and 9% had G6PD deficiency. Other causes included 16.3% sepsis, 1.6% urinary tract infections, and 5.7% asphyxia, while 1.6% had gastrointestinal obstruction. Furthermore, 1.6% experienced cephalohematoma, and 0.8% had maternal diabetes (Javadi and Mohsenzadeh, 2005: 73) <sup>[4]</sup>.

Baskabadi and colleagues (2017) investigated the frequency and characteristics of jaundice in newborns of diabetic mothers and compared them with jaundice in newborns with unknown causes. In this cross-sectional study, data from 2,800 jaundiced newborns who visited Qaem Hospital in Mashhad from 2007 to 2014 were analyzed. The characteristics of 59 jaundiced newborns with a history of maternal gestational diabetes were compared with 78

jaundiced newborns for whom no cause of jaundice was identified (control group). After confirming jaundice in the newborns based on the doctor's diagnosis and laboratory results, a researcher-designed questionnaire containing maternal data (maternal issues during pregnancy, type of delivery) and newborn characteristics (age, gender, birth weight, weight at onset of jaundice, length of hospital stay, age at onset of jaundice, age of recovery) and laboratory data was completed. The findings revealed that the prevalence of jaundice due to maternal diabetes was 2.10%. Birth weight, weight of the newborn at admission, parity, maternal age, age of recovery, cesarean delivery, preterm status, and length of stay were higher in the group of newborns with jaundice of unknown cause.

Woodgate and colleagues conducted a study on jaundice in newborns in 2015. This research was a systematic review aimed at answering clinical questions regarding the effects of different wavelengths of light in hospital phototherapy as a treatment for unconjugated hyperbilirubinemia in term and preterm infants.

In 2022, Seneadza investigated jaundice in newborns. This study utilized a cross-sectional design, interviewing mothers attending prenatal and postnatal clinics at three selected health centers in two regions. The chi-square test was used for analysis. The findings indicated that despite a high level of awareness about newborn jaundice, there are still gaps in

mothers' knowledge, attitudes, and understanding regarding jaundice in newborns (Seneadza, 2022) <sup>[11]</sup>.

**Research Method**

The present study is an applied research that utilized the existing files of all newborns with jaundice at Abu Ali Sina Hospital in Balkh during the year 2022. The sample size for this study consisted of all children visiting the internal medicine and pediatric services. The sample size was randomly selected using Morgan's table and Cochran's formula, totaling 3,629 individuals. Data were collected from patient files and then entered into SPSS 27 for analysis.

**Analysis**

**Table 1:** Descriptive Statistics of Neonatal Admissions by Gender

Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	1740	48
	Female	1889	52
Total		3629	100.0

Table (1) shows the descriptive statistics of hospitalized newborns categorized by gender. Among the total (3,629) individuals, there were 1,740 males and 1,889 females, which correspond to percentages of 48% and 52%, respectively.

**Table 2:** Descriptive Statistics of Neonates with Jaundice, Preterm Birth, and Neonates with Sepsis

	Percent	Valid Percent	Cumulative Percent
Total Neonatal Jaundice		2177.4	60
Term		762.09	35
Preterm		1394.055	65
Kerin Icterus		25	0.70
Physiology		1763.6	81
Pathology		413.6	19
ABO		28	7
RH		8	2
Neonatal with Sepsis		217.7	10

Table (2) presents the descriptive statistics of the number of jaundiced patients, preterm infants, and infants with sepsis. Among the 3,629 hospitalized newborns, 2,177 were diagnosed with jaundice, 762 were term infants, 1,394 were preterm, 25 had Kernicterus, 1,763 were classified as physiological jaundice, 28 had ABO incompatibility, 8 had Rh incompatibility, 413 were categorized as pathological, and 217 were diagnosed with sepsis.

**Conclusion**

Jaundice is a symptom that typically indicates issues such as an abnormal increase in bilirubin levels in the blood. This problem can occur in infants due to various causes. The study of jaundice prevalence in children depends on the underlying cause of jaundice, contributing factors, and different geographical and social conditions. In some regions of the world, neonatal jaundice is more common due to factors such as viral infections or liver function disorders. The present study is an applied research that utilized the existing files of all newborns with jaundice at Abu Ali Sina Hospital in Balkh during the year 2022. The sample size for this study consisted of all children visiting the internal medicine and pediatric services. The sample size was randomly selected using Morgan's table and Cochran's

formula, totaling 3,629 individuals. Data were collected from patient files and then entered into SPSS 27 for analysis.

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