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Evaluation of bilirubin levels and physiological with jaundice factors in newborns

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Abstract:

Background: Jaundice, which occurs due to high levels of bile, is one of the most common problems that newborns suffer from during the first days of their lives. It occurs especially in those born before the normal birth date. Approximately 80% of premature babies who are born in the 38th week suffer from jaundice in the first week of their lives. This jaundice is usually harmless and disappears naturally and gradually. The values of bilirubin at which jaundice becomes dangerous for the child vary depending on the child's weight and age and the presence of disorders related to the liver and bile ducts.

Objective: This study aims to evalution the rates of increased jaundice and the effects or risks it may cause to newborn babies.

Methods & Materials: A study was conducted on 70 newborns at Zliten Hospital, and was conducted during the period (from March to June) 2024, during which patient data was collected and the types of analyzes were learned and how they were conducted to determine the level of bilirubin.

Results: Through the results, it was found that (51.4%) of the children were male, and (48.6%) were female. Most of the children's weights ranged from (2.5 to 4.4), and the bilirubin rate ranged from (6.2 to 8.7). The results showed that most of the infected children they have blood types A+ and O+ at rate of (64.3%).

Conclusion: From this study, it was concluded that jaundice is one of the most common diseases in newborns, and that there are relationships between the infection and blood types. The infection also occurs due to incompatibility of blood types between the mother and the child, which causes the fetus's blood cells to break down. It has also been found that a high incidence of the disease occurs in the first days after birth

Introduction:

Jaundice disease is one of the most common conditions that require medical care in newborn children. Approximately 60% of term and 80% of preterm newborns develop jaundice in the first week of life.

Bilirubin is known as a chemical substance produced by the breakdown of old red blood cells in the liver, which is naturally excreted in the stool, but if it is too high, it leads to yellowing of the skin and a change in eye color. Jaundice is dangerous when a high rise in the level of bilirubin occurs and leads to the substance accumulates in the brain and causes a serious condition called nuclear jaundice, which leads to mental retardation and motor insufficiency (Mitra S, Rennie J 2017). The values of bilirubin at which jaundice becomes dangerous for children vary depending on weight and age, but there are some infections in children that are associated with liver disease and infections of the bile ducts (Watchko JF, Tiribelli C 2013).

Caused by incomplete liver development and maturation, wheezing usually occurs in babies born before 38 weeks of pregnancy (premature babies) and some breastfed babies. Wheezing usually occurs because the baby's liver is not mature enough to eliminate bilirubin from the blood.

Wheezing usually appears between the second and fourth days after birth. The baby should be examined for wheezing between the third and seventh days after birth, when bilirubin levels are usually at their highest (Danielle Moores 2021).

Neonatal or physiological jaundice is a type of harmless jaundice that occurs naturally in newborn children and usually appears as a yellowing of the skin and eyes as a result of the breakdown of fetal hemoglobin and some metabolic and physiological changes that occurred after birth.

It begins within two days of birth and continues for the eighth day in normal infants and until the fourteenth day after birth in premature infants (Rozance PJ 2021).

Other causes of jaundice include blood group incompatibility (Rhs or Abo incompatibility are the most common. (Desjardins L, 1979).

Research aims:

Develop an educational program for future mothers about the spread of jaundice and explain the consequences of infection with jaundice.

Determining the incidence of the disease at the level of Zliten city according to the rate of bilirubin.

Determine the i nfection rate according to gender.

Determine the infection rate according to the child's weight.

Determine the relationship that shows the difference in (Rh) and (ABO) between the mother and the child.

Research hypothesis:

Is the high bilirubin that causes bronchial disease related to the research variables that will be studied, which are sex, pregnancy period, type of breastfeeding, weight, blood type difference, and whether consanguineous marriage represents an essential role in the spread of this disease in the target study sample?

Information about the study

Type of study:

An analytical survey (Evaluation of Bilirubin levels in newborns with jaundice).

Study area:

The study was conducted in medical central of Zliten (Libya).

Study duration:

The study was conducted during the period (from March to June 2024).

Target population & sample size:

This study included 70 newborns with jaundice in first days of birth.

Type of sample:

Serum bilirubin level was measured by device spectrophotometric

Tools used in analysis:

1-collection tubes do not contain an anticoagulant.

2-Plastic injection to pull the blood sample size 5 ml.

3-Gloves. Sample

4-Hematology solutions.

5-Cotton and medical solution for sterilization during clouds.

6-The ring to show the vein.

Results:

From this study the following results were reached:

1-There is a relationship between injury and weight, where weights from (2.5 to 4.4) are more susceptible to injury.

2-There is a relationship between the infection and blood types, and the difference in blood types between the child and the mother affects the rise in bilirubin.

3-Through the results of this study, it was found that male children with type O+ are more susceptible to infection, and female children with type A+ are more susceptible to developing high bilirubin.

4-The highest infection rate was in the first week of birth.

Discussion

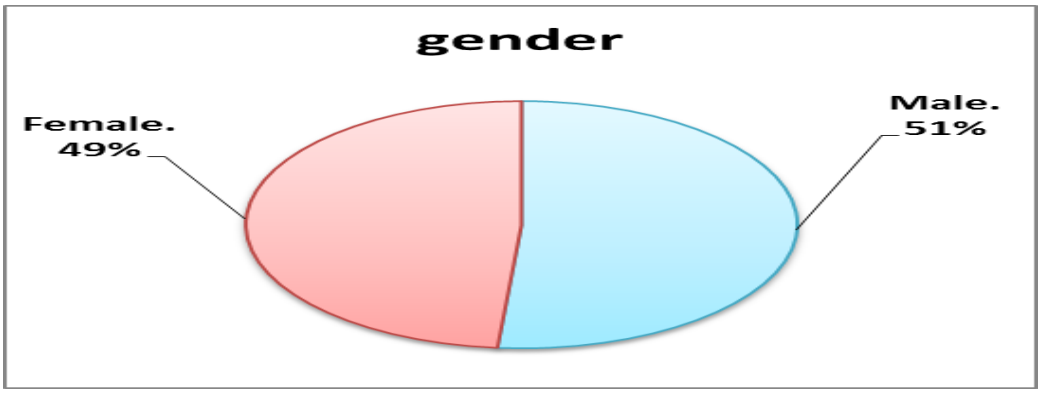
Distribution of sample members according to the sex of the child

Table (1) shows the results of the statistical analysis for (gender).

Gender	*N*	*Percent*
Male.	*36*	*51.4*
Female.	*34*	*48.6*
Total	*70*	*100.0*

From the table above it is clear that the majority of the study population are (males) at a rate of (51.4%).

And graph Shows this.



A figure 1 Showing circular cross section showing the percentages according to sex of the child.

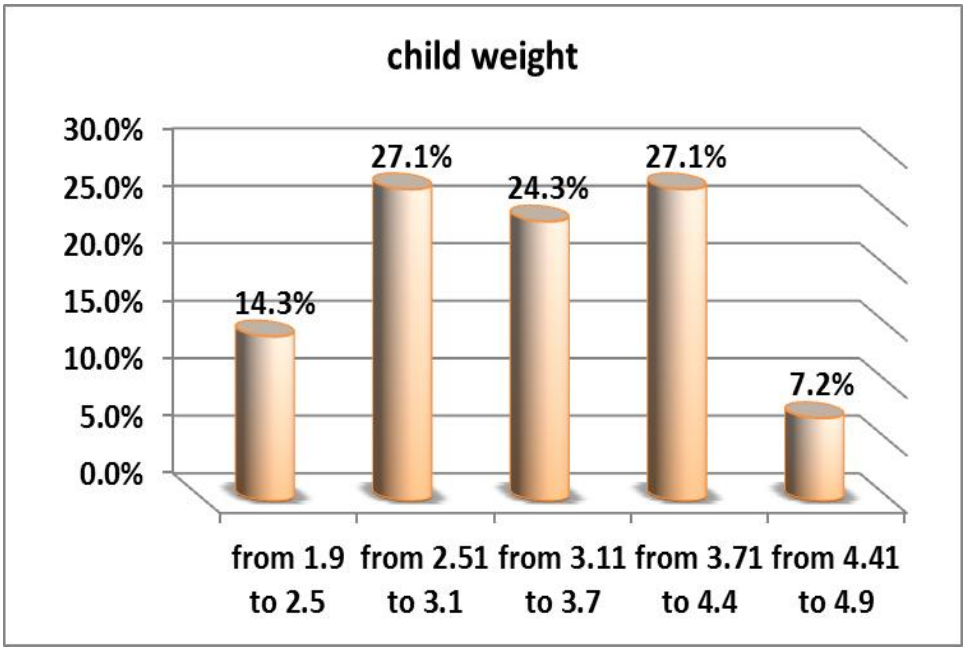
Distribution of sample members according to weight:

Table (2) Shows the results of the statistical analysis of (child weight).

child weight	*N*	*Percent*
from 1.9 to 2.5	*10*	*14.3*
from 2.5 to 3.1	*19*	*27.1*
from 3.1 to 3.7	*17*	*24.3*
from 3.7 to 4.4	*19*	*27.1*
from 4.4 to 4.9	*5*	*7.2*
Total	*70*	*100.0*

From the table above it is clear that the weightiest children are (from 2.51 to 3.1) and (from 3.71 to 4.4) at a rate of (27.1%) for each.

And graph no. (2) shows this.



A figure (2) Distribution of sample members according to weight.

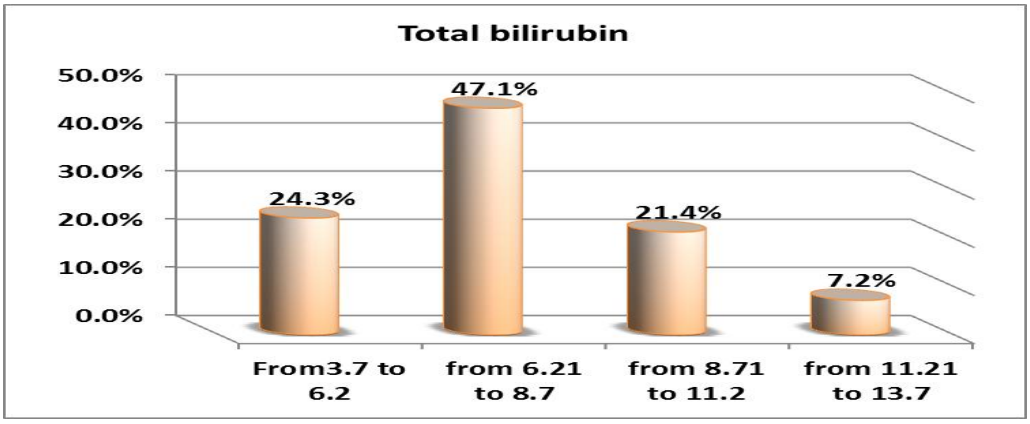
Distribution of sample members according to the level of bilirubin in the blood:

Table (3) Shows the results of the statistical analysis of (Total bilirubin).

Total bilirubin	*N*	*Percent*
From3.7 to 6.2	*17*	*24.3*
from 6.21 to 8.7	*33*	*47.1*
from 8.71 to 11.2	*15*	*21.4*
from 11.21 to 13.7	*5*	*7.2*
Total	*70*	*100.0*

From the table above it is clear that the highest level of those who have (Total bilirubin) in the blood (from 6.21to 8.7) is (47.1%).

And graph no. (3) shows this.



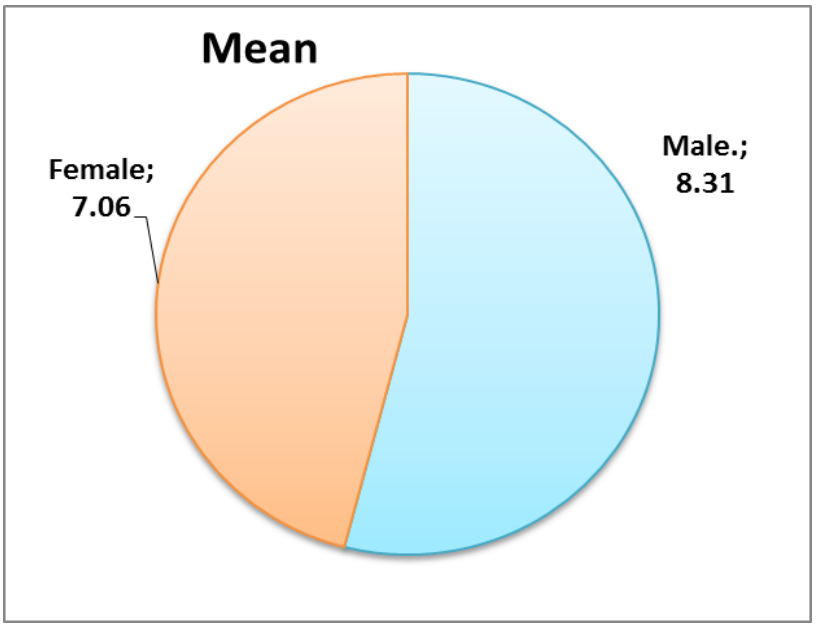
A Figure (3) Distribution of sample members according to the level of bilirubin in the blood

Table (4) Shows the comparison (Total bilirubin) in categories (Gender).

Gender	*N*	*Mean*	*Std. Deviation*
Male.	*36*	*8.31*	*2.15*
Female	*34*	*7.06*	*1.84*
Total	*70*	*7.70*	*2.09*

From the table above it is clear that the highest average for those with (total bilirubin) in the blood is (8.31) at (Male).

And graph no. (4) shows this.



A figure (4) shows the comparison (Total bilirubin) in categories (Gender).

Conclusion:

Jaundice is considered one of the most common diseases that affect newborns, and high levels of bilirubin are considered one of the most important causes of this disease.

In this study, we tried to shed light on jaundice in newborns and educate future mothers due to the lack of health awareness about the causes and types of the disease, the symptoms associated with the disease, the method of treating it, and the correct behavior if it occurs. We were also able to view the laboratory equipment and understand its working mechanism, as well as identify and clarify the relationship between the child's weight and the height of jaundice, & the relationship between different blood types & Rh factor incompatibility, which leads to its occurrence. Jaundice increases the incidence of the disease and its negative impact on the child's health.

Through this study, we also learned about the prevalence of jaundice and the various causes of its occurrence in newborns.

Finally, early diagnosis of jaundice prevents newborns from developing jaundice and developing a nervous system disorder.

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