

A Cross- Sectional Study of Admitted Neonates for Therapy with Jaundice Through the Year 2019 as a Result of ABO Incompatibility at Tarhuna Educational Hospital

Tawfg Omar Abdilmola ^{1*} Ali Guma Azbida ²

^{1,2} Department of medical laboratory, Faculty of Medical technology, Azzaytuna University -Libya.

*Corresponding author: E-mail addresses: amartawfik@gmail.com

Volume: 4

Issue: 2

Page Number: 32 - 38

Keywords:

Neonates, Jaundice, ABO, Neonates Incompatibility

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Received: 22\07\2025

Accepted: 28\08\2025

Published: 30\08\2025

DOI: <https://doi.org/10.71147/xfeaez29>



ABSTRACT

One of the most common causes of neonatal jaundice is ABO incompatibility. Maternal fetal ABO blood group incompatibility, in which the mother has blood group O and the newborn has blood group A and B occurs in 15-20% of all pregnancies. The jaundice of neonates due to ABO incompatibility is one of the problems that newborns suffer during the first week of their lives. **The study aims:** to find out the prevalence of jaundice due to ABO incompatibility in the Tarhuna Education Hospital. **Material and method:** A number of 214 newborns have been studied at Tarhuna Education Hospital from January to December 2019. Information was collected from the archive through a form on the information on the disease. Data were analyzed by Microsoft Excel 2007 for percentages. **Result:** Through the results obtained, it was found that (58.88%) the neonate was male and (41.12%) females from 214 hospitalized neonates. The percentage of neonates without jaundice was (%53.27), while the total of jaundiced neonates represented (46.73%). There was (%29.91) of neonatal jaundice due to other causes while (16.82%) of them as a result of ABO incompatibility. **Conclusion:** It has been found that (16.82%) jaundiced neonates due to ABO incompatibility and jaundice neonate due to other case (29.9%). jaundiced neonates as a result of ABO incompatibility in mothers blood group O+ most occurs exclusively in infant with baby's blood group A + which showed 44.44% while B+ and A- represented (16.67 %) and (13.89 %) respectively.

1. INTRODUCTION

Neonatal jaundice (NNJ) is one of the most widespread clinical signs in newborn infants. Jaundice displays as yellow staining in the skin and sclera in infants. Jaundiced neonates are a familiar state worldwide occurring in up to 60% of term and 80% of preterm newborns in the initial week of life. It has been reported that severe Hyperbilirubinemia (Jaundice) and its complication noticed in most regions of the world, such as Asia, Africa, The Middle East, Australia, and the USA. Mortality as a result of severe hyperbilirubinemia has attracted the attention of researchers.

In 2010, it was estimated that 114,000 children died and 75,000 children were left with brain damage as a cause of neonatal jaundice. Neonatal jaundice is one of the leading causes of neonatal death and neonatal brain damage in low- and middle-income countries (Mitra & Rennie, 2017; Adoba et al., 2018; Li et al., 2021; Inamori et al., 2021). One of the most known causes of neonatal jaundice is ABO incompatibility. Newborn infants with mater-fetal ABO incompatibility are at a greater risk for increasing subsequent significant hyperbilirubinemia, and therefore, the prediction of probable risk factors, such as the degree of hemolytic, gains importance. Maternal-fetal ABO blood group incompatibility, in which the mother has blood group O and the newborn has blood group A or B occurs in 15 to 20 % of all pregnancies. The hemolytic disease develops in approximately 10% of such newborns and may be associated with clinically significant neonatal hyperbilirubinemia. Hemolytic jaundice caused by blood group incompatibility has significant morbidity and mortality in the neonatal period (Abbas et al., 2020; Akgül et al., 2013; Erlichman et al., 2016; Tanyer et al., 2001). Newborns who exceed the upper reference limit of bilirubin receive treatment for jaundice, including phototherapy. American academy of pediatrics that newborns discharged within 48 hours should have a follow up visit after 48 to 72 hours for any significant jaundice and other problem. This recommendation is not appropriate for our country due to limited follow up facilities in the community. These babies may develop jaundice which may be overlooked or delayed in recognition unless the baby is closely monitored (Inamori et al., 202; AAPs, 2004; Patel et al., 2017). **Aim of the study:** This study was aimed to estimate the prevalence of jaundiced neonates as a result of ABO incompatibility at Tarhuna hospital in 2019, and determine the highest blood group of neonates with jaundice due to ABO incompatibility.

2. METHOD

Study area and duration:

This study was conducted on patients at Tarhuna Educational Hospital during the period from 1st of January to 30 December 2019.

Study sample size:

214 neonates who were admitted to the hospital at study period.

Data collection:

Data were collected from the hospital archives by preparing a structured form to collect data, which included sociodemographic data as mothers' blood groups, blood groups of neonates with jaundice due to ABO incompatibility, the sex of the child, and results of total and direct bilirubin analysis.

Data analysis:

The results obtained were represented in tables and graphs, and analyzed using Microsoft Excel to achieve valid and reliable results.

3. RESULT

The results of this study showed that the total number of births in Tarhuna Educational Hospital at 2019 was 2,543, the mortality rate among whom was 1.53%, while 8.42% of them were admitted to the hospital for treatment, whereas 90.05% left the hospital directly, and all of this is shown in Table 1.

Table 1: showing the total birth in Tarhuna Educational Hospital during period of this study

	Percentage	Number
Discharged neonates	2290	90.05 %
Admitted neonates	214	8.42 %
Mortality	39	1.53 %
Total	2543	100%

As illustrate in figure 1, the distribution of neonates those were admitted to the hospital according to baby gender was, 58.88% male and 41.12% female.

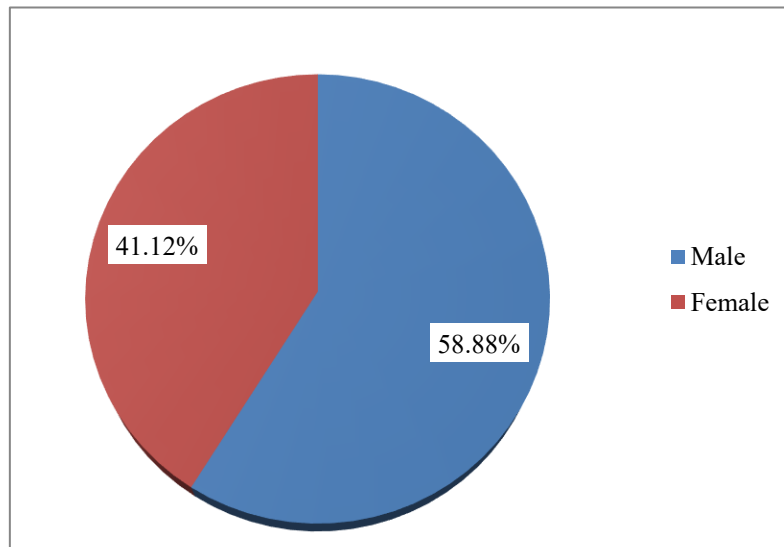


Figure 1: Admitted neonates to the hospital according to gender.

As for maternal blood groups of 214 neonates who were admitted to the hospital, figure 2 shows that the highest percentage was of blood group O+ (42.52%), in contrast, the lowest percentage was of blood group B- (2.34%). While other blood group presented 22.43 % for A+, 5.61 % for A-, 12.15 % for B+, 10.28% for O- and 4.67% for AB+.

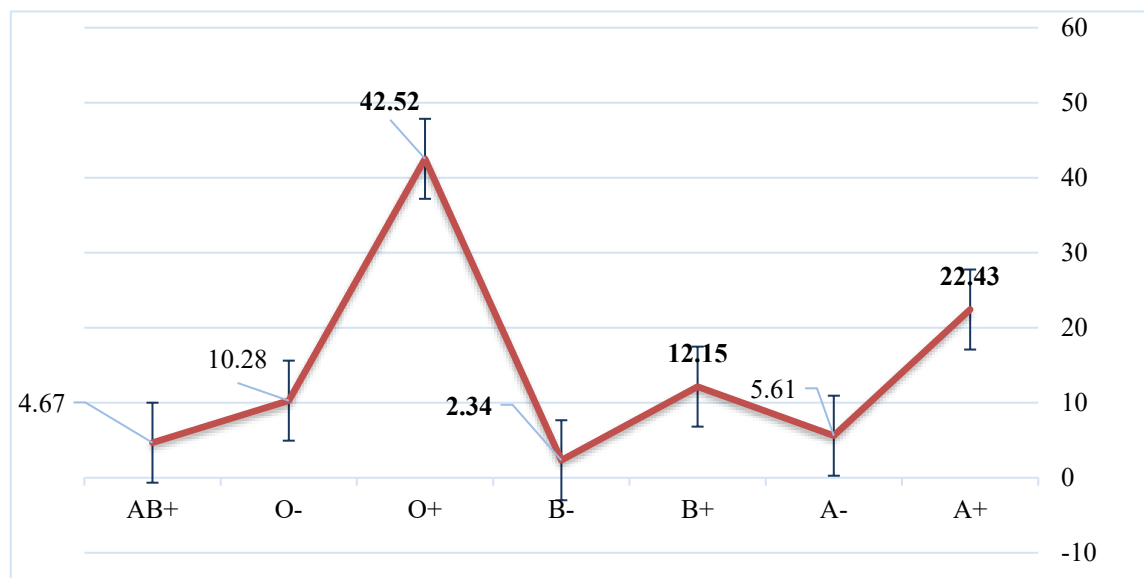


Figure 2: A graph chart showing the distribution of mothers' blood groups of neonates admitted to the hospital.

On the other hand, the results of the current study showed that the highest percentage of blood groups among admitted neonates was blood group O+ which amounted to 39.71%, followed by blood group A+ which represented 34.57%; as for the rest of the blood groups, they were as follows: 11.21%, 5.61%, 4.67%, 3.27%, and 0.93% for the blood group B+, A-, AB+, factions. O- and B- respectively.

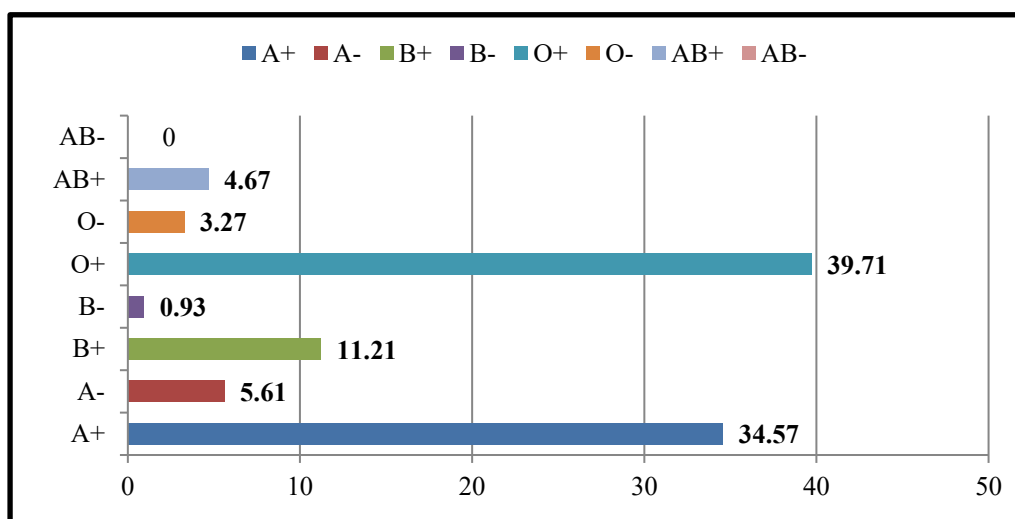


Figure 3: shows the percentage of admitted neonates according to babies' blood groups

The results of this study also showed that 100 newborns (46.73%) of the children who were hospitalized were suffering from jaundice, whereas 114 (53.27%) were not suffering from jaundice. Considering gender, 42.86% of males were suffering from jaundice and 57.14% were not suffering from it; while the rate of females suffering from jaundice was 52.27% and those without 47.73% female cases, as shown in Figure 4 and Table 2.

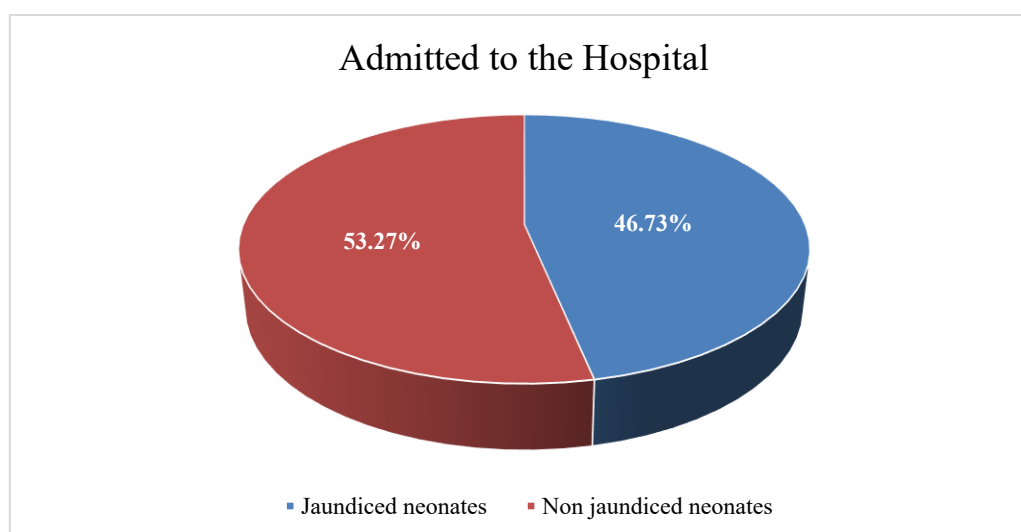


Figure 4: distribution of admitted neonates as jaundiced or non.

Table2: distribution of jaundiced and non-jaundiced newborns according to gender.

	Female	Male
Jaundiced neonates	46 (52.27 %)	54 (42.86 %)
Non jaundiced neonates	42 (47.73 %)	72 (57.14 %)
Total	88 (100 %)	126 (100 %)

The results showed that, out of 214 cases of admitted neonates, 36(16.82%) were suffered from jaundice due to ABO incompatibility “18 male and 18 female), and 64 (29.91%) were suffered from jaundice due to other causes “36 male and 28 female); in contrast, 114 (53.27%) were non jaundiced, as Table 3 illustrated.

Table 3: Jaundiced neonates as a result of ABO incompatibility and other causes

Sex	Jaundice causes			Non jaundice
	ABO incompatibility	Other causes	Total	
Male	18 (8.41%)	36 (16.82%)	54 (25.23%)	72 (33.64%)
Female	18 (8.41%)	28 (13.08%)	46 (21.50)	42 (19.63%)
Total	36 (16.82%)	64 (29.91%)	100 (46.73%)	114 (53.27%)

Eventually, the current study findings demonstrated that when the mother's blood group was O+, there were 16 (44.44%), 5 (13.89%), and 6 (16.67%) neonates with blood groups of A+, A-, and B+ respectively suffering from jaundice due to the incompatibility of the mothers' and babies' blood groups; while, when the mother's blood group was O-, there were 5 (13.89%), 1 (2.78%), and 3 (8.33%) neonates with blood group of A+, A-, and B+, respectively suffering from jaundice. Notably, no incidences of jaundice were seen in admitted neonates belonging to the other blood groups, as shown in Table4

Table 4: Jaundiced neonates as a result of mother's and baby's ABO blood group incompatibility

BBG	MBGO+	MBGO-	Total
A+	16(44.44 %)	5(13.89 %)	21(58.33%)
A-	5(13.89 %)	1(2.78 %)	6(16.67 %)
B+	6(16.67 %)	3(8.33 %)	9(25 %)
TOTAL	27(75 %)	9(25 %)	36(100%)

4. DISCUSSION

This study on ABO incompatibility in neonatal jaundice could be considered as the first cross sectional study with a proper sample size was done in this region. This study has been estimated the prevalence of neonatal jaundice due to the ABO incompatibility at Tarhuna Educational Hospital among neonates who admitted to the hospital for therapy. As it has been discussed in the previous study, the ABO incompatibility is considered as one of the most common causes of neonatal hyperbilirubinemia (Chen et al., 2012). This study included 214 newborns, it was found that (16.82%) of the newborns suffered from jaundice due to incompatibility with the ABO types, and (29.91%) of the study sample suffered from jaundice as a result of other causes. Form the results it is clear that hyperbilirubinemia in newborns as a result of ABO incompatibility is considered as a risk factor as other studies have been reported. Similar investigation has showed that (21.8%) of the 400-jaundice neonate have the jaundice due to ABO incompatibility (Chen et al., 2012; Kimball, 2019; Hameed et al., 2011) .

Hospitalization of jaundiced neonates as a result of ABO incompatibility in mothers blood group O+ most occurs exclusively in infant with baby's blood group A + which showed 44.44 % while B+ and A- represented (16.67 %) and (13.89 %) respectively. About one third of the neonatal jaundice was due to ABO incompatibility. There was no important difference in severity and outcome in both O-A and O-B incompatibility, although O-A incompatibility was more. Similar observations were made by Abbas et al 5. However jaundiced neonates as a result of hemolytic anemia as a result of blood group incompatibilities between mother and neonates is one of the commonest causes of hyperbilirubinemia in the newborn (Saeed et al., 2009; Nagashree et al., 2019).

6. CONCLUSION

A cross-sectional study was conducted to estimate the prevalence of jaundice neonates as a result of ABO incompatibility. This study collected data from 214 admitted neonates with jaundice for therapy. Other risk factors for like RH incompatibility and other causes have been excluded to reach the goal of current study. It has been found that one of third of total jaundiced neonates was as a result of ABO incompatibility.

As of these results, a considered proportion of jaundice due to the difference in blood groups between mothers and neonates, affects the rise in bilirubin. However, further studies are recommended with large size of sample on different variable such as RH incompatibility and other causes to understand the higher probability of jaundiced neonates.

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