Analytical study of the reality of cliques ABO incompatibility in newborns at Al-Yarmouk and Al-Kadhimiya teaching hospitals in Baghdad province

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Summary

In this study blood samples were collected from 150 newborns (NBs), In a period from 2008-2010, with blood groups A and B from mother's blood group O positive and those who do not have any other reason for the jaundice..Of 150 NBs, 105 have blood group A and 45 with group B. And the male to female ratio was 1.7:1. The average of NBs age at the onset of jaundice was 19.02 hrs, it was earlier in blood group B and in newborns of first pregnancy. The average of serum bilirubin level at 24 hours was 5.70 mg/dl; there was no statistical value of the blood group and the sex of the NBs in the bilirubin level. Newborns had anemia at delivery in 12 cases, 6 of them were premature. Fifty one NBs were followed for late anemia and found 36 (70%) had anemia. Comparing results between NBs who had anemia and those who had not, found that the bilirubin level was higher in anemic NBs, and they had longer stay in Hospital.

Keywords: ABO incompatibility, Jaundice, Anemia, newborns.

Introduction

The ABO blood groups incompatibility is common occurrence and often has no significance; it is a medical problem worthy of attention in Iraq. It may, however, cause hematological disease in newborns (1). The ABO blood group incompatibility occurs when the mother blood group type O and the newborn is either A or B blood group in 40% of infant, The ABO blood group incompatibility hemolytic disease developments only in 10% of newborns and the hemolytic disease appeared in about 2/3 cases as disease recorded in the new (1 and 2). The hemolytic disease usually occurs from the first pregnancy with a rate of 40-50% of newborns and it is rear in the following pregnancy (2 and 3). The clinical symptoms include ABO incompatibility cliques that do not usually appear until after the birth as the Jaundice. The basic appearance usually begins during the first 24 hours of life. And as Anemia: hemoglobin levels usually remain within the domain of natural for NBs of the same gestational age, also, anemia could be occur at the age of 8-12 weeks especially when the NBs needs to address the phototherapy or blood transfer (4). Rosen and Geha (4) also reported additional signs, but the magnitude of such is rare liver and spleen. The importance of research to increase the frequency of repulsion cliques ABO as a cause of hemolytic anemia in NBs born recently, compared with the repulsion RH, which is occurred after the use of Anti D. Requires knowledge of the extent of hemolytic injury and time of the onset of symptoms and severity, as well as follow up the newborns infected to detect any mixing of early or late sign and important of treatment in hospital (4 and 5).

Materials and Methods

A hundred and fifty NBs at AL-Kadhimiya and Al-Yarmouk Teaching Hospitals who carry blood groups type A or B , born from O-positive mothers. The model of information data include the 150 newborns, rank and time of the start of jaundice and severity of the existence of precedents family history of jaundice at the fraternity. Whole blood from the mother (5.0 mL) and the baby (2.0 mL) were collected into separate labeled dry, plain, clean bottles and allowed to clot. After 1 h standing at room temperature for complete clot retraction, the sera samples were separated after centrifugation at 5000 rpm for 10 min. The sera samples were stored at −20°C, while the red cells were stored at 4°C until the time of analysis. Laboratory study was to conduct hemoglobin at 24 and 48 hours after a month

and two months, as well as a study of the Bilirubin at 24 hours and 48 hours.

Direct Coomb's Test (DCT) was done on the babies' cells according to the method of (6). ABO cells and serum grouping were done on the mothers' and the babies' samples according to the methods of (7). Antibodies detection and quantization were done on the mothers' serum samples according to the method of (8 and 9).

Results and Discussion

The total 150 NBs included in present work persons carry blood group A or B and their mothers' the entire group O- positive. The percentage of ABO Incompatibility was 12% of all pregnancies. Total NBs form group A was 105 (70%) of all NBs and group B 45 was 30% (Table, 1).

Table, 1: The distribution of newborns according to their blood Group

Group A	105	70%
Group B	45	30%

The number of males NBs was 96 (64%) were distributed across the study as follows: Blood group A was found in blood of 61 and group B in 35 NBs. The number of females was 54 NBs divided as follows: Blood group A was found in 44 and group B in 10 NBs .While the male to female ratio was 1:1.7 (table, 2).

Table, 2: The distribution of newborns according to Newborn blood groups and sex ratio

Sex	Number	%	A group	B group
Male	96	64%	61	35
Female	54	36 %	44	10

The 150 NBs were included in present study, of them 67 (44.5%) were got from the first pregnancy, and the other 83 (55.5%) NBs was obtained from a previous pregnancy in included 18 cases from abortion (table, 3).

Table, 3: The distribution of newborns in order of pregnancy

Order Number	Number	Percentage of pregnancy
First pregnancy	67	44.5%
Previous pregnancies	83	55.5%

The totals of 130 (87%) cases were obtained from normal pregnancy and 20 (13%) from premature abortions, (table 4).

Table 4: The distribution of newborns according to age

Age of pregnancy	Number	Number Percentage
Normal pregnancy	130	87%
Premature	20	13%

History of the brothers with jaundice observed in 22 (14.6%) cases with unknown causes about the jaundice in siblings. Nine of those NBs were treated with a light phototherapy, other 9 cases were treated by replacement of blood , while 4 (2.6%) cases was not curable, (table,5).

Table, 5: The history of jaundice in newborns brothers

Number			Percentage
No family history		128	85.4%
Positive family history	Replacement of blood	9	6%
	Phototherapy	9	6%
	No Hospitals	4	2.6%

Laboratory coombs tests was performed directly in 131 NBs only 11(8.5%) showed a positive, while the indirect coombs test was negative in all tested NBs. as shown in Table-6.

Table, 6: Combs built the test result- immunity test

Direct Coombs test	Number	Percentage
positive	11	8.5%
Negative	139	91.5%

Bilirubin in serum of the NBs was noted and jaundice was happened in recently NBs in varying ages , started in the first 24 hours of life in 99 cases (66%), while the jaundice was appeared in 10 (6.6%) after 24 to 48 hours of age and found in 41 (27.45%) cases of older age (table,7).

Table, 7: The time of jaundice appearance in newborns

Start time	Number	Ratio
> 24 hours	99	66%
24 to 48 hours	10	6.6%
<48 hours	41	27.8%

The average age of newborns at the start of jaundice was 19 hours. The average age was 21.5 hrs recorded in NBs carrying blood group type A while group B Showed jaundice earlier at 13.7 hrs. Applying the test of the difference between the average combined, find that Z = 6.61 and statistical significant (P<0.05) difference. Other workers (10) also, was recorded the average age of NBs was 28 hrs in group B and first pregnancy. Compare the time of the start of jaundice in terms of sex, the average age of males NBs was 18.44 hrs while in female was 20.13 hrs, no statistically differences was found.

Studied the effect of pregnancy order on the time of the jaundice start, the two groups of newborns were taken from the first pregnancy as A group and NBs from multiple pregnancies previous group (whether pregnancies natural or abortions) as B group. The results indicated that the average age of the NBs of the first pregnancy was 17 hrs compared to 20.12 of the other group, no statistical difference was found. While the mean average values of bilirubin two groups of NBs in the first 24 hours of life was 5.30 mg/dl. The average value in blood of NBs carrying group A was 5.7mg/dl and 5.8mg/dl in group B. Test the difference between the averages combined did not find a statistical differences. Also, there were no differences during first 24 hrs of life between male and female NBs in the average values of bilirubin. While the impact of brothers history of jaundice which raise the values of bilirubin, compared between the recently NBs who have a history of brothers jaundice, appeared with the average of was 6 mg/dL, while the NBs with no brothers history of jaundice had the value of bilirubin 5.81 mg / dl, no statistically difference was found.

The existence of appositive family with jaundice history when the brothers in 22 cases (14%), it did not find any effect of the existence of precedents in raising the values of bilirubin (12). Present work did not find any role for the pregnancy in order to influence the severity of high bilirubin in NBs, and this is supported not exacerbate the severity of hemolysis cascade pregnancies. While the factors that may have an impact on the duration of Hospitalization did not find any significant factor like blood groups or sex or gestational period on the impact on the number of days of Hospitalization.

Hemoglobin measurement has been monitoring to 51 NBs aged 24, 48 hrs, month and 2 months after birth. The average values of hemoglobin in NBs at 24 hours was 12.7 g / dl, 12 (8%) had anemia at 24 hours (including 6 preterm infant, Premature) of them, 6 NBs obtained from the first pregnancy and 6 from the multiple pregnancies. While the average hemoglobin values after 48-hour was 14 g / dl. And the average of the low hemoglobin was recorded at the ages of 24-48 hrs was 1.15 g / dl. The application of statistical study to examine the effect of blood groups on the rate of hemoglobin decline, found that the average decline in hemoglobin in group A was 1.1 g / dl and 1.28g/dl in group B, no statistical differences was found. While the measurement of the hemoglobin values at month and two months of age in 51 NBs, anemia was recorded in 36 (70.5%) NBs only.

The percentage of hemolysis in 67 cases was 44.5% occurred in the first pregnancy and it is not necessary to have a history of pregnancies of abortion to hemolysis happen (11). Anemia was found in 29 males (56.8%) and 22 (43.2%) females NBs, male to female ratio was1:1.3 which is close to the proportion of the overall study (1:1.7). Anemia was observed in 38 NBs of blood group A and 13 NBs group B. As well as in 19 NBs (37.2%) from first pregnancy and 32 NBs (62.7%) of previous pregnancies similarly, no statistical difference between the previous groups was found. Tiker *et al.*, (10) reported in 136 Turkish NBs the level of hemoglobion and bilirubin of incompatibility ABO was 14.8% this percentage is close to present study.

The average days of Hospitalization in normal recently NBs not develop anemia was 2.5 days, while the average days of Hospitalization in NBs who happened to have anemia late was 4 days with statistically significant (P<0.05) differences between the two groups, this supports the previous result which showed that the numbers of NBs showed bilirubin were higher in the of previous pregnancies.

The average values of hemoglobin in NBs that happened to have anemia two months of age was 9g / dl. The number of newborns

recently who required Hospitalization 48 states together (32%), and this percentage is relatively high compared with rates of other causes of Hospitalization. This indicated that the importance of the repulsion cliques ABO as a cause important to the Hospital when the newborns born recently, and to examine factors that may have a role to Hospitalization. Present study did not find significant differences for the newborn blood groups, or pregnancy in order to increase the proportion of Hospitalization.

Study of hemoglobin during the first 24 hours and 48 hours was observed anemia only in 12 cases (8%), and the values of hemoglobin close to normal in the remaining cases, this refers to the fact that anemia mark is not common in the repulsion cliques ABO, and perhaps this is due to weak capacity antigenic total factors ABO (13, 14, 15 and 16). The rate of decline in hemoglobin between the ages of 24-48 hours is 1.1 g / dl did not find any role for the clique blood or sex of newborn or order of pregnancy in effect on the rate of decline in hemoglobin, and the study of anemia late been a hemoglobin age of one month and two months at 51. Newborns were noted anemia in 36 late Newborns (70%) and a high percentage refers to the importance of follow-up to the fact that hemoglobin anemia occurs late was relatively high (17, 18 and 19). The males NBs were likely to have anemia with ratio of 1:1.3 to female, indicated that males were more likely to anemic late, and the males peak values of bilirubin was 13.1 mg / dl higher than the rest of the newborns. The duration of hospitalization have longer than the rest of the recent newborns and this refers to the need for follow-up of newborns who had high bilirubin as accuse for anemia. Blood transfusion was performed in 6 cases (17%), 4 of them were obtained from aborted cases which were more premature and need for blood transfusions (20, 21 and 22).

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دراسة تحليلية لواقع تنافر الزمر ABO عند الاطفال حديثي الولادة في مستشفى اليرموك والكاظمية التعليمي في محافظة بغداد

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الخلاصة

جمعت 150 عينه من الاطفال المولودين حديثا من ذوي الزمرة A و B[A 105 وليداً، B 45 وليداً]من أمهات زمرة O,في مستشفى اليرموك والكاظمية / بغداد للفتره بين عامي 2008-2010 ,بلغت نسبة الذكور إلى الإناث 1:1.7، و بلغ متوسط عمر الاطفال المولدين حديثا عند بدء اليرقان 19.02 ساعة، وكان البدء أبكر عند ولدان الزمرة B، وكذلك عند ولدان الحمل الأول. وصل متوسط عيار البيلروبين بعمر 24 ساعة إلى 5.70 مغ/دل ولم نجد أي أهمية إحصائية لزمرة دم الوليد أو جنسه في التأثير على عيار البيلروبين. لوحظ وجود فقر دم في 12 حالة عند الولادة 6 منهم كانوا خدجاً. أجريت متابعة لـ 51 وليداً لتسجيل فقر الدم المتأخر الذي وجد في 36 حالة (70 %) و عند مقارنة مجموعتي الاطفال المولدين حديثا المصابين بفقر دم المتأخر مع الاطفال غيرالمصابين بفقر دم وجدنا أن عيار البيلروبين كان أعلى عند الاطفال المولدين حديثا الذي اوصيبو بفقر دم كذلك كانت مدة الاستشفاء لديهم أطول.

الكلمات المفتاحية: تنافر الزمر ABO , اليرقان, فقر الدم، حديثي الولادة.