FREQUANCY OF ABO AND RHESUS INCOMPATIBILITY IN NEONATAL JAUNDICE

نسبة انتشار ABOوRH عدم التوافق في الأطفال حديثي الولادة المصابين باليرقان الولادي

Dr.Hithab jawad muhsen, MBChB,DCH,CABP
Pediatric department, medical college ,Kufa university
e:mail hedabjawad@yahoo.com

ABSTRACT

Background: jaundice is the commonest medical condition affecting infants in first week of life. the cause is bilirubin deposition in the skin. jaundice in newborn is a result of increased RBC destruction and decreased bilirubin elimination.

Aim of study: The aim of this study is prescribe the frequency and severity of Rh and ABO incompatibility in neonates admitted to Pediatrics & Neonatology unit, al-Zahraa teaching Hospital, Najaf, Iraq.

Patients and methods: This descriptive study done in neonatal intensive care unit, in al- Zahraa teaching hospital ,Najaf ,Iraq. 300 neonate admitted to neonatal unit from period of first of May 2014 to august 2014 with jaundice were included in the study.

Results: from 300 neonate with jaundice , 144(48%) were female and 156(52%) male , the frequency of ABO , combined ABO and RH and RH incompatibility in neonates with jaundice was 99(33%), 36(12%), 51 (17%) respectively .

15(22.7%) of neonate with ABO and 21(31.8%) with RH incompatibility treated with exchange transfusion. While 4 (1.3 %) and 10 (3.3 %) of patient with ABO and RH incompatibility respectively developed sign of kernicterus on discharge.

Conclusion: out of 300 neonate presented with jaundice , most common hemolytic cause was ABO-incompatibility 99(33%), followed by Rh –incompatibility 51(17%),

Rh –incompatibility is more severe than ABO , 21(31.8%) of patients with RH incompatibility treated with exchange transfusion and 10(3.3%) of them discharge with sign of kernicterus.

Key Words: hyperbilirubinemia, Kernicterus, ABO-incompatibility, Rh-incompatibility Najaf, Iraq

الخلاصة:

الخلفية: تحديد مدى حدوث حالات عدم التوافق لل- ABO and RH في الأطفال حديثي الولادة المصابين باليرقان وتقدير الخطورة لكل الأنواع المختلفة من اليرقان الولادي

الطريقة: دراسة وصفية في المستشفى اجريت في وحدة العناية المركزة لحديثي الولادة في م.الزهراء ،نجف،عراق، 300 ادخلوا إلى الوحدة من الفترة بين آذار 2014 الى أب 2014 مشخصين سريريا باليرقان الولادي ادخلوا الدراسة.

النتائج: من 300 طفل حديث الولادة مصابين باليرقان الولادي 156% كانوا ذكور و48% اناث نسبة حدوث ABO and, ABO RHمعا ،RH في هذه الدراسة كان 33%،12%،17% بالتعاقب و38% للأسباب الاخرى وتشمل اليرقان الفسلجي ،G6PD ، وتعفن الدم. 22.7% من الاطفال مع ABO و 31.8% مع RH عولجوا بتبديل الدم بينما 1.3% و3.3% من المرضى مع ABOوRH بالتعاقب اظهروا علامات ضرر الدماغ(كيرنكترس).

الاستنتاج: من 300 طفل حديث الولادة مصابين باليرقان الولادي اكثر نوع وجد هو ABO 33% ثم RH 17%. نوع RH اكثر خطورة3.3 % سرحوا مع علامات ضرر الدماغ .التشخيص المبكر والإجراءات الوقائية للأطفال في خطر يقلل من الإصابة بضرر الدماغ

المفتاح: زيادة البلروبين ،ضرر الدماغ، ABO,RH نجف -عراق

INTRODUCTION

Neonatal jaundice consider commonest problem affect infants in first week of their life. Around 50% of term and 80% of preterm infants have jaundice, usually appears 2-4 days after delivery and ends i somehow after 1- 2 weeks.[1,2] .

it is a yellowish discoloration of skin, sclera, and mucous membranes due to deposition of bile salts . according to the cause it may appears at birth or any time during the neonatal period. It is due to either indirect or direct, bilirubin within the first day of life should be taken seriously[3] .

Early identification and good management of neonatal jaundice (NNJ) should done to decrease the neurological complications of the disease[4] .

Kernicterus or bilirubin encephalopathy results from the deposition of unconjugated (indirect) bilirubin in the basal ganglia and brain stem nuclei[3].

Hemolytic disease of the newborn (HDN) is a situation that life span of fetal red cells (RBCs) is diminished by effect of maternal antibodies against the antigens that found on RBCs. Anti-D is a commonest cause of mild, moderate and severe HDN. Red cells destruction started in intrauterine life and it causes anemia, hydrops fetalis and intrauterine death[5].

The commonest hemolytic cause of jaundice in first 24 hour of life is rhesus (Rh) type. The mother sensitized because of fetomaternal transfusions in her last pregnancy, anti-D IgM and IgG are produced. Anti-D IgG is the cause for rhesus disease in the neonate because it cross placenta. Rhesus (Rh) type develops between an Rh-negative women (sensitized) and her Rh-positive baby[6].

ABO incompatibility (women blood group O, baby blood group “A” or “B”), is the comments cause for hemolytic jaundice in united kingdom occurs in 15% of pregnancies. IgG antibody is the couse for this conditions[6].

ABO type is a common condition in a newborn but causes lowest hemolysis. It may cause increased level of bilirubin and anemia but to lower extent than RH hemolytic disease.[7]

Bilirubin encephalopathy is mostly occur when bilirubin levels greater than 20 mg/dl. The risk of encephlopathy is lower in full term baby as compared to pre-term infants. Phototherapy and exchange transfusion are the treatment available to decrease the risk of kernicterus[8]

All pregnant women should be investigated for ABO and Rh types and search for antibody during first visit for her doctor . The first investigations will help to recognized women that need an anti-immunoglobulin (Rh IG) and further monitoring. Rh IG given to mother leads to more than 90% decrease in alloimmunization rate . [9]

PATIENTS AND METHODS:

A cross sectional study done in Department of Pediatrics and Neonatology, al-Zahraa teaching hospital, Najaf, Iraq, from first of May to august in 2014. All newborn with visible jaundice both male and female in the neonatal ward were included in this research.

After getting permission from ethical committee in the hospital to do the research, information brings together from all admitted neonates who have visible jaundice . We asked the Parents about the age that jaundice is present in their babies, and other data like name, age, sex, address ,mode of delivery, type of feeding, date of admission all entered into a perform.

The skin, sclera and mucous membrane was examined for jaundice. The required investigations like serum bilirubin level (total, direct and indirect), coombs test, retic count , blood culture, G6PD are done . Blood groups and coombs test of baby and mother were done in hospital laboratory for development of Rhesus (Rh) and ABO incompatibility in jaundiced neonates. Clinical and neurological examination were done for all admitted neonate for sign of kernicterus, decrease feeding, lethargy and hypotonia were symptoms in the first stage , while hypertonia, retrocollis and opisthotonus were symptom in the last stage of the disease. The serum sum up from an issue of blood and examined in an automated analyses. All these variables were analysed for percentages and frequencies. Mean +/- standard deviation was counted for quantitative changeable such as age of baby and at which age the jaundice appears , body weight and total serum bilirubin levels. For sex boys to girls rate was counted. The results were presented through figures and tables. All the

information was supplies and analysed by statistics scheme SPSS version 20 for windows. In which we set p value <0.05 as significant.

RESULT

from 300 infants have jaundice involved in the research, 156 (52%) were male while 144(48%) were female .

Out of 300 neonates 99 were diagnosed as ABO-incompatibility with clinically diagnosed jaundice makes up(33%) from all cases, while 51 infants diagnosed as Rh type calculating for (17%) from all cases. Thirty six neonate(12%)diagnosed as combined ABO and RH incompatibility.

Out of the remaining 114(38%) cases,58 (19.3%) cases diagnosed as physiological jaundice , G6pD in 30 (10%)neonates and sepsis in 26 (8.7%) neonates.(figure 1)

In our study we consider minimal age was 1 day and maximum age was 28 days while minimal weight was 1.20Kg and maximum weight was 4.20Kg as shown in table1.

Out of 99 neonate with ABO incompatibility, 15(22.7%) treated with exchange transfusion. While 21(31.8%) of RH incompatibility were treated with exchange transfusion , as shown in table2

Out of 99 neonate with ABO 4(1.3%) and 10 (3.3%) with RH incompatibility developed sign of kernicterus as shown in table 3

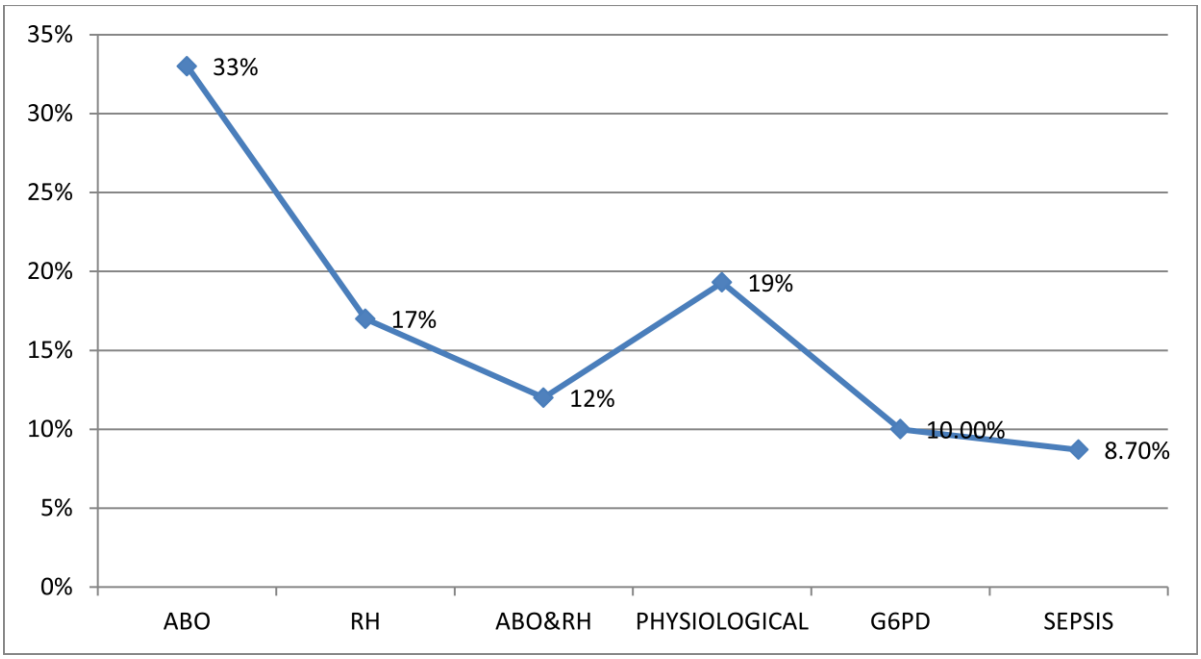

Figure 1: Shows different type of jaundice

Table(1): Demographic characteristics of neonates with neonatal jaundice

	minimum	maximum	mean	Standard deviation
Age/day	1.00	28.00	6.2400	4.5077
TSB	9.50	30.00	17.3280	4.13987
Weight/kg	1.20	4.20	2.9725	0.67145
Day of jaundice	1.00	5.00	2.4583	0.85477

Table (2): Relation between diagnosis and type of treatment

		Treatment			P value
		Intensive phototherapy	phototherapy	ET	
Diagnosis	ABO	30	54	15	0.002
		31.2%	39.1%	22.7%	
	RH	15	15	21	
		15.6%	10.9%	31.8%	
	ABO&RH	12	12	12	
		12.5%	8.7%	18.2%	
	OTHER CAUSES	39	57	18	
		40.6%	41.3%	27.3%	
Total		96	138	66	
		100.0%	100.0%	100.0%	

Table(3): Relation between diagnosis and state at discharge

Diagnosis	Normal discharge	Sign of kernicterus
ABO	95 (31.7%)	4 (1.3%)
RH	41 (13.7%)	10 (3.3%)
Combined ABO&RH	34 (11.3%)	2 (0.6%)

DISCUSSION:

Severe Neonatal hyperbilirubinemia carries an immediate danger of constant neurological sequelae. The early discovered of infants who are at a greater danger for having jaundice is of serious matter to stopping brain injury[10].

In our research there was no significant difference in incidence of NNJ between male (52%) and female (48%), the p value= 0.073 , in a study done by Irshad, M., Muhammad, etal in 2016[11] in Pakistan which shows male predominance . and other study done by C Henny-Harry; HTrotman, in west india in 2012[12] shows comparable result.

In our study there was no significant difference in incidence of NNJ and residency, type of feeding, mode of delivery.

ABO incompatibility was found to be frequent cause of neonatal hyperbilirubinemia in our study,(33 %) and then RH isoimmunization (17%) , while combined form (ABO&RH) was (12%) the P value less than 0.001. This is similar to results obtained by Cariani et al. [13] in Venezuela. And other studies done abroad[14,15,16,17,18] . They all agree that ABO incompatibility was more prevalent than RH incompatibility in their studies. Routine screening for ABO incompatibility is presently not performed in AL-Zahraa Teaching Hospital with most babies discharged as soon as possible after delivery.

There were significant association in our study between type of treatment and diagnosis, most of neonate with RH isoimmunization treated with exchange transfusion (31.8%) as comparison to neonate with ABO incompatibility (22.7%), p value= 0.002 the same result found in a study done

by Owa JA, Ogunlesi TA. IN 2009[18] In our study 10(3.3%) of neonate with RH , 4(1.3%) of neonate with ABO and 2(0.6%) of neonate with combined RH and ABO type develop sign of kernicterus. Twelve before admission while four during admission. It is nearly same that occurred in other study.[19].

In our study in 300 neonates with jaundice mean total serum bilirubin in ABO incompatibility was 19.3 in RH incompatibility was 19.63 in ABO&RH was 17.08 ,p value<0.001.

CONCLUSIONS

ABO-incompatibility is the most common Couse of neonatal jaundice followed by Rh-incompatibility. As soon as jaundice and its type in infants are recognized and early treatment of severe type is important for stopping brain injury.

Abbreviation:

RH	Rhesus
NNJ	Neonatal Jaundice
ET	exchange transfusion
G6PD	Glucose_6 phosphatase dehydrogenase
IG	immunoglobulin
TSB	Total serum bilirubin

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