

## The prevalence of neonatal jaundice due To Rh isoimmunization and ABO incompatibility Admitted to the maternity and children Teaching hospital in Al-diwaniya city.

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### الخلاصة

اليرقان الولادي من المشاكل الاكثر شيوعا عند الولدان. 65% من الولدان يصابون باليرقان الظاهر سريريا عندما تصبح نسبة الصبغة الصفراوية فوق 5 ملغ بالديسلتر خلال الاسبوع الاول من حياتهم. يعتبر اصفرار الدم او فرط الصفراء سام في المستويات العاليه بالدم مما يؤدي الى اعتلال دماغي يدعى اليرقان النووي . احدى اسباب اليرقان الولادي هو عدم تطابق عامل Rh و صنف الدم ABO بسبب الانحلال المناعي لكريات الدم الحمراء عند المواليد. الهدف من الدراسة لقياس مدى انتشار اليرقان الولادي بسبب عدم تطابق عامل Rh و صنف الدم ABO وتعيين نوعية العلاج المستلم , وايجاد العلاقة بين العمر الحملي وسبب اليرقان ونوعية العلاج . وكذلك التعرف على مدى حدوث تبادل الدم بين المواليد الناضجين والخدج . أجريت الدراسة على 55 وليد أدخلوا الى م | الولاده والاطفال التعليمي في مدينة الديوانيه من أجل التعرف على مدى وقوع اليرقان الولادي وعلاجه بسبب عدم تطابق عامل Rh و صنف الدم ABO. بينت الدراسة ان انتشار اليرقان الولادي بسبب عدم تطابق صنف الدم بين الام والطفل بلغ 81,8% , وبسبب عدم تطابق عامل Rh 56,3% , وكان السببان معا بنسبة 38,1% . 65,4% من الذكور , 34,5% من الاناث . كانت نسبة الذكور الى الاناث 1,8:1 . 80% من المواليد الناضجين المصابين باليرقان كان سببه عدم تطابق في صنف الدم ABO , 86,6% من الاطفال الخدج المصابين باليرقان كان سببه في عدم تطابق عامل Rh . لقد تم علاج جميع المرضى بواسطة العلاج الضوئي , 15 مريض (27,2%) تم علاجهم بعملية تبادل الدم , و 15 مريض (27,2%) تم علاجهم بالطريقتين . يستنتج مما تقدم ان اليرقان الولادي بسبب عدم تطابق عامل Rh هو أقل تكرارا وأكثر شدة من عدم تطابق فصيلة الدم ABO وغالبا ما يحتاج الى عملية تبادل دم وخصوصا إذا كان الوليد خديج . العلاج بواسطة مضاد D مهم جدا وفعال للوقايه من مضاعفات عدم تطابق عامل Rh مع المطالبه بتثقيف الامهات .

مفتاح الكلمات: اليرقان الولادي , فرط الصفراء , تمنيع اسوي , فصائل الدم .

### Abstract

Jaundice is a common neonatal problem. 65% of newborns develop clinical jaundice with bilirubin level above 5 mg/ dl during the first week of life. Hyperbilirubinemia can be toxic, with high level resulting in encephalopathy known as Kernicterus. Rh and ABO incompatibility are one of the causes of neonatal jaundice due to immune hemolysis of RBC in infants.

The aim of the study was to measure the prevalence of the neonatal jaundice caused by Rh and ABO incompatibility and identify the type of therapy they received, and to find the relation of gestational age with the cause of jaundice and their treatment, also with the incidence of exchange transfusion to each one (find the relation of Term or Preterm babies with ABO or Rh incompatibility as causes of their jaundice).

A total number of 55 neonates who were admitted to the maternity and children teaching hospital in Al-Diwaniya city were studied for the incidence of ABO and Rh incompatibility as causes of neonatal jaundice. Their treatment also subjected to the study. The study found that the prevalence of neonatal jaundice due to ABO incompatibility were 81.8% and due to Rh isoimmunization were 56.3%, and due to both were 38.1%. 65.4% male and 34.5% female with M: F ratio 1.8:1. 80% of full-term babies their jaundice due to ABO incompatibility where as 86.6% of preterm babies their jaundice due to Rh isoimmunization. All babies with jaundice treated with phototherapy, 15 patients (27.2%) were treated with exchange transfusion and 15 patients (27.2%) were treated with both (phototherapy and ET). Neonatal jaundice due to Rh isoimmunization is less frequent and more sever than due to ABO incompatibility and mostly required exchange transfusion particularly if the neonate is preterm. Anti-D is most important and effective therapy for prevention of Rh isoimmunization, maternal education is required.

**Keywords:** Neonatal jaundice, hyperbilirubinemia, Rh isoimmunization, ABO –blood types.

**Abbreviation:** T.S.B = Total serum bilirubin, ET=Exchange transfusion.

## **Introduction**

Neonatal jaundice (neonatal hyperbilirubinemia) is the most common condition of otherwise healthy, full-term newborn during the first week of life (1). Nonetheless, untreated sever, indirect hyperbilirubinemia is potentially neurotoxic, and conjugated direct hyperbilirubinemia often signifies a serious illness. Jaundice is observed during the first week of life in approximately 60% of full term infants and 80% of preterm infants (2).

We select in our study, the incidence of Rh isoimmunization and ABO incompatibility as the cause of neonatal jaundice and exclude the other causes. The stimulation of the immune system of the mother takeplace when small amount of blood cross the placenta from Rh + ve fetus to Rh-ve mother (3-6). This Rh+ve antigen (mostly Rh D) triggers the

immune system to form antibodies against the Rh+ve RBC in the Rh-ve mother (2, 4).

Neonatal jaundice is a major clinical problem globally, especially in the Asian and south-east Asian regions (7). death from Kernicterus may occur, particularly in countries with less developed medical care system. Phototherapy, i.v immunoglobulin and ET are the most widely used therapeutic modalities in Infants with neonatal jaundice (8).

## **Methods**

A total number of fifty – five cases of neonates, aged 1day – 22 days were included in this study, at the maternity and children teaching hospital in AL-Diwaniya city, in the neonatal care unit. In this study was restricted to the patients with neonatal jaundice due to only ABO incompatibility and Rh isoimmunization and exclude the other causes. The study was conducted during the period of 1/5/2007 to 1/10/2007 at the maternity and children teaching hospital in AL-Diwaniya city.

Each patient has blood group and Rh with the blood group and Rh of their mother. Each one has frequent estimation of T.S.B and was treated with phototherapy or ET or both according to the level of T.S.B, body weight, age of the neonate, gestational age and the general condition of the neonates.

## **Results**

Fifty – five patients with neonatal jaundice due to ABO Incompatibility and Rh isoimmunization were studied. The age of patient range from 1day – 22 day (mean 6.6 days).there were 36 males (65.4%) and 19 females (34.5%), male to female ratio M:F1.8:1(Table1)

Thirty-nine patients (70.9%) with body weight >2.5Kg and 16 patients(29%) with body weight <2.5Kg. (Table 2)

Regarding the gestational age, the full-term babies were 40 (72.7) and preterm babies were 15 (27.2%) (Table 3).

Fourty-five patients delivered by NVD (normal vaginal delivery) (81.8%) and 10 patients delivered by caesarean-section (18.1%) (Table 4).

The number of patient with jaundice due to ABO incompatibility were 45(81.8%) , Rh isoimmunization = 31

Patient (56.3%), with both=21 patients (38. 1%). (Table 5)

All the newborns in the study period were treated by phototherapy and 15 patients (27.2%) were treated with ET and the last 15 patients (27.2%) were treated by both (phototherapy and ET). (Table 6).

Thirty-Two of full-term babies (80%) their jaundice due to ABO incompatibility while 18 babies (45%) their jaundice due to Rh isoimmunization, 8 babies (20%) undergo ET.

Twelve preterm babies (80%), their jaundice due to ABO incompatibility, 13 cases (86.6%) is due to Rh isoimmunization, 7 cases (46.6%) undergo ET. Regarding patients with ABO incompatibility, 45 (100%) received phototherapy, 10 cases (22.2%) had ET , where as the Rh isoimmunization ,31 cases (100%)had received phototherapy ,and 12 cases (38.7%) had ET .

Seven patients, their jaundice were due to both ABO incompatibility and Rh isoimmunization, had ET. While 21 neonates, their jaundice was due to both ABO and Rh incompatibility, had received phototherapy.

**Table 1 :Sex of patient in the study.**

Male	female
36 (65.4%)	19 (34.5%)

**Table2: 2Body weight of patient in the study.**

> 2.5 kg	39 (70.9%)
< 2.5 kg	16 (29.0%)

**Table 3: Gestational age of patient.**

Term	40 (72.7%)
Preterm	15 (27.2%)

**Table 4:Type of delivery.**

NVD	CS
45 (81.8%)	10 (18.1%)

**Table 5: The causes of neonatal jaundice.**

ABO	45 (81.8%)
Rh	31 (56.3%)
Both	21 (38.1%)

**Table 6: The type of treatment.**

Phototherapy	55 (100%)
Exchange transfusion	15 (27.2%)
Both	15 (27.2%)

**Table 7: The relation between gestational Age and the cause of jaundice and Type of treatment.**

	ABO	Rh	Phototherapy	ET
Term	32 (80%)	18 (45%)	40 (100%)	8 (20%)
Preterm	12 (80%)	13 (86.6%)	15 (100%)	7 (46.6%)

**Table 8: The relationship between the causes of The jaundice and the type of treatment.**

Type of Treatment Cause of jaundice	Phototherapy	Exchange transfusion
ABO	45 (100%)	10(22.2%)
	Both	Both
Rh	21	7
	31 (100%)	12 (38.7%)

## **Discussion**

In the present study, we found that the incidence of neonatal jaundice due to ABO incompatibility more common. than Rh isoimmunization ,it was (81.8%) in comprason to Rh isoimmunization (56.3%) ,that is mean the proportion of Rh-ve mother is less than the proportion of Rh +ve mothers in the our community ,16% is comparable with American figure (15%) and European figure (15%) (9).

The severity in Rh isoimmunization is more than the severity in ABO incompatibility where the result show the percentage of patients needed exchange transfusion is much more in Rh isoimmunization (38.7%) than ABO incompatibility (22.2%) , as most of Rh-ve mothers did not have proper antenatal care and some of them not received Anti-D after each delivery due to lack of education about the problem or sometimes the Anti-D is not available.Regarding the treatment ,most patient admitted to hospital because of high level of T.S.B and required phototherapy where as other patient , with low level of T.S.B neither admitted nor phototherapy required.

We found that the incidence of ET is (27.2%) in our study and we didn't find the incidence of ET in other studies previously.

## **Continue-discussion**

The incidence of ABO incompatibility (80%) is more than the incidence of Rh isoimmunization (45%) in the full-term infants (37 weeks of gestation and more) while the ABO

incompatibility (80%) is less than Rh isoimmunization (86.6%) in the preterm infants (less than 37 weeks gestation) . this mean that the ABO incompatibility is more common in the term babies and the Rh isoimmunization is more common in the preterm babies , so more sever jaundice noticed in preterm babies than term infants.

## **Conclusions**

- 1. ABO incompatibility is more common than Rh Isoimmunization as a cause of neonatal jaundice.**
- 2. The degree of jaundice is more sever in Rh isoimmunization than ABO incompatibility.**
- 3. Exchange transfusion in Rh isoimmunization is more than in ABO incompatibility.**
- 4. All the patient was in need for phototherapy once admitted to the hospital.**

5. ABO incompatibility more common than Rh isoimmunization in full-term infants.
6. Rh isomunization is more than ABO incompatibility in preterm babies.
7. The severity of the jaundice is more in preterm babies.than full-term and more incidence of ET occur in preterm.
8. Anti-D is found to be the most important and effective mean to prevent Rh isoimmunization and should be available at any time, lastly more education required about this problem.

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