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AN ASSESSMENT OF THE INTRAVENOUS (I/V) IMMUNOGLOBULIN ROLE TO MANAGE NEWBORNS WITH ONE-YEAR AGE & DIAGNOSED WITH ISO-IMMUNE JAUNDICE

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Abstract:

Objective: *We aimed to assess the effectiveness and safety of intravenous immunoglobulins as an alternative therapy in the neonates diagnosed with iso-immune hemolytic jaundice.*

Methodology: *We conducted this research at Sir Ganga Ram Hospital, Lahore from February to November 2017 in the neonatal department. We included all the jaundice ABO or RH iso-immune patients on the first day of birth. Every newborn received intravenous immunoglobulin and phototherapy during the treatment period in order to fight the disease.*

Results: *Our research samples consisted of ninety-one newborn patients diagnosed with iso-immune jaundice at the time of birth. These patients were also hospitalized in the neonatal unit for onward treatment. The disease incidence was because of incompatibility of ABO in 85 of the newborns (93.4%) among a total of 91 patients; whereas, only six patients due to RH incompatibility (6.6%) among 91 patients. Every case was positive in the direct Coombs assessment in the RH incompatible patients; whereas, it was positive in sixteen patients due to the incompatibility of ABO. We managed the newborns with a dose of IVIG (0.5 g/kg) for the time of four hours in every twenty-four hours. Patients received three doses with this scheme; whereas, in one patient the treatment employed was exchanged transfusion. Twenty-two patients received a blood transfusion (24%) among 91 patients. Majority of the patients stayed at the hospital for a period of three to four days.*

Conclusion: *We conclude that effectiveness and safety of intravenous immunoglobulin to treat RH & ABO hemolytic jaundice diagnosed patients is better in order to decrease hemolysis, level of serum bilirubin and the exchange transfusion requirements.*

Keywords: *RH Incompatibility, Jaundice, ABO Incompatibility and Intravenous Immunoglobulin (IVIG).*

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INTRODUCTION:

Iso-immune hemolytic jaundice in newborns refers to transplacental and production specific maternal immunoglobulin G (IgG) passage of the antibodies which is opposite to the fetal antigen, its outcomes are anaemia, fetal RBCs immune destruction and hyper-bilirubinemia. There is a usual involvement of the postnatal A & B antigen and prenatal RH (D) antigen [1]. First line newborn hemolytic disease management is an exchange of transfusion and phototherapy in the patients of RH iso-immunization, severe anaemia patients and in the patients with an increased incidence of hyperbilirubinemia; still, the success rate of these therapies is controversial [2].

A higher dose of the intravenous (i/v) immunoglobulin in the range of (500 mg – 1000 mg) over the period of two to four hours is capable to decrease and control the level of bilirubin in the newborns diagnosed with iso-immune jaundice. The actual mechanism is not well-known, but in the light of prevalent theoretical perceptions immunoglobulin occupies reticuloendothelial cells FC receptors; which ultimately prevents these receptors from lysing and taking up antibody-coated RBCs [1, 3, 4].

METHODOLOGY:

We conducted this research at Sir Ganga Ram Hospital, Lahore from February to November 2017 in the neonatal department. We included all the jaundice ABO or RH iso-immune patients on the first day of birth. Every newborn received intravenous immunoglobulin and phototherapy during the treatment period in order to fight the disease. We did not include any premature newborn in this particular research.

We documented the information and values of CBC, blood film, bilirubin level, LFT, maternal blood group, neonatal blood group, blood culture and direct combs test. In addition to that, we also documented the hospitalization period. Patients received intravenous immunoglobulin (0.5 gm/kg) for the time of four hours in every twenty-four hours and phototherapy.

RESULTS:

Our research samples consisted of ninety-one newborn patients diagnosed with iso-immune jaundice at the time of birth. These patients were also hospitalized in the neonatal unit for onward treatment. The disease incidence was because of incompatibility of ABO in 85 of the newborns (93.4%) among a total of 91 patients; whereas, only six patients due to RH incompatibility (6.6%) among 91 patients. Every case was positive in the direct Coombs assessment in the RH incompatible patients; whereas, it was positive in sixteen patients due to the incompatibility of ABO. We managed the newborns with a dose of IVIG (0.5 g/kg) for the time of four hours in every twenty-four hours. Patients received three doses with this scheme; whereas, in one patient the treatment employed was exchanged transfusion. Twenty-two patients received a blood transfusion (24%) among 91 patients. Majority of the patients stayed at the hospital for a period of three to four days.

ABO was incompatible in ninety-four percent of the patients. There were 48.4% cases with A+ Blood Group; whereas, maternal blood group was O+. On the other hand, 45% with maternal O+ and neonatal B+ blood group. RH incompatible cases were only 6.6% in this series. Every RH incompatible case was positive for the outcomes of direct Coombs test; whereas, ABO incompatible cases were sixteen in number among the total of eighty-five patients.

Majority of the cases stayed in the hospital for three to four days that constitutes about (95.7%) patients; whereas, just (4.3%) stayed for a longer duration of ten to fifteen days because of the neonatal sepsis elements. Gram-negative sepsis and positive sepsis were respectively in three and one patient. We reported a significant increasing trend in the incidence of transfusion of blood (22 newborns). Detailed outcomes analysis is as under (Table – I, II & III).

Table – I: Jaundice Causes

Cause	Number	Percentage	+ DCT
ABO Incompatible	85	93.40	16
Maternal O+ & Neonatal A+	44	48.40	-
Maternal O+ & Neonatal B+	41	45.00	-
RH Incompatible	6	6.60	6

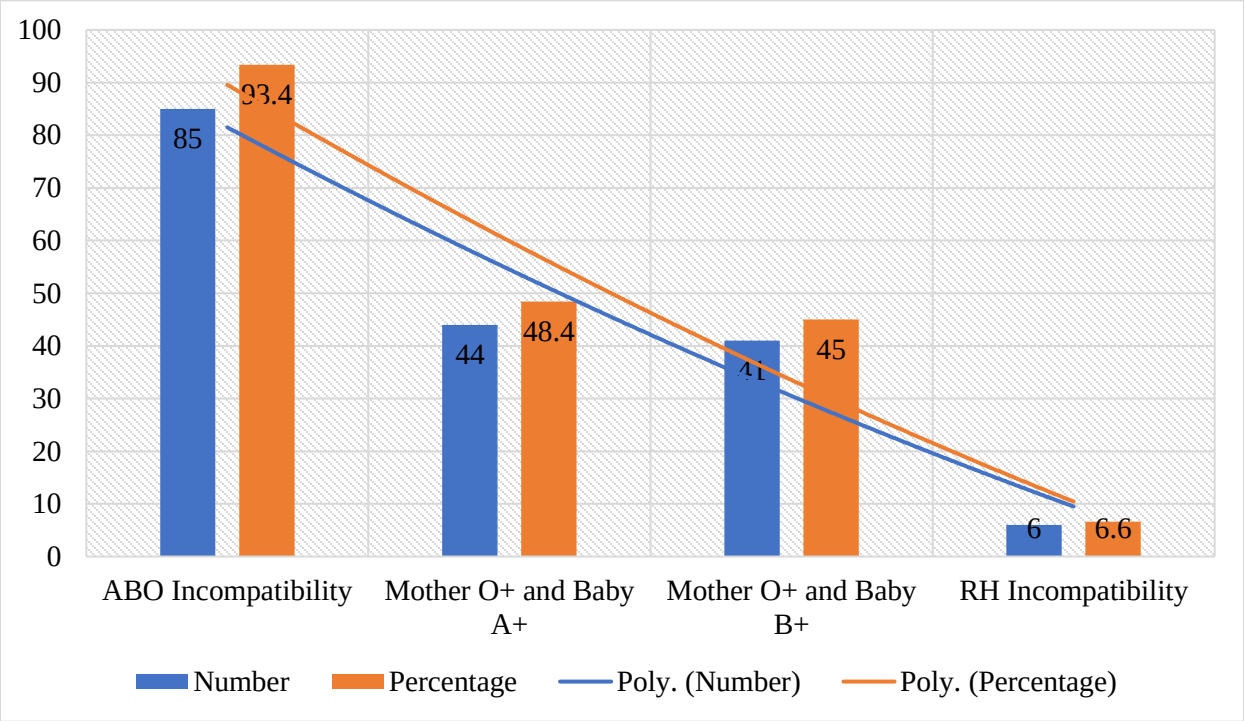


Table – II: Hospitalization Course

Course	Number	Percentage
Phototherapy	91	100.00
IVIG	91	100.00
Exchange Transfusion	1	1.00
Hospitalization (3 – 4) days	87	95.70
Hospitalization (10 – 15) days	4	4.30
Blood Transfusion	22	24.00
Gram-negative (Positive Blood Culture)	3	3.30
Gram-Positive (Positive Blood Culture)	1	1.00

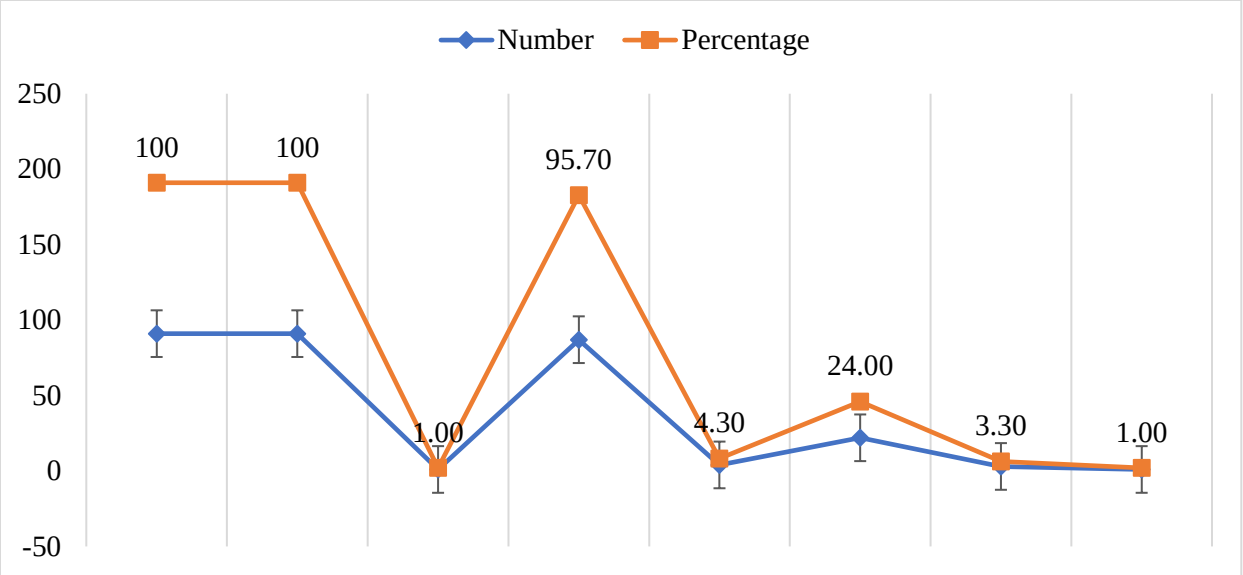
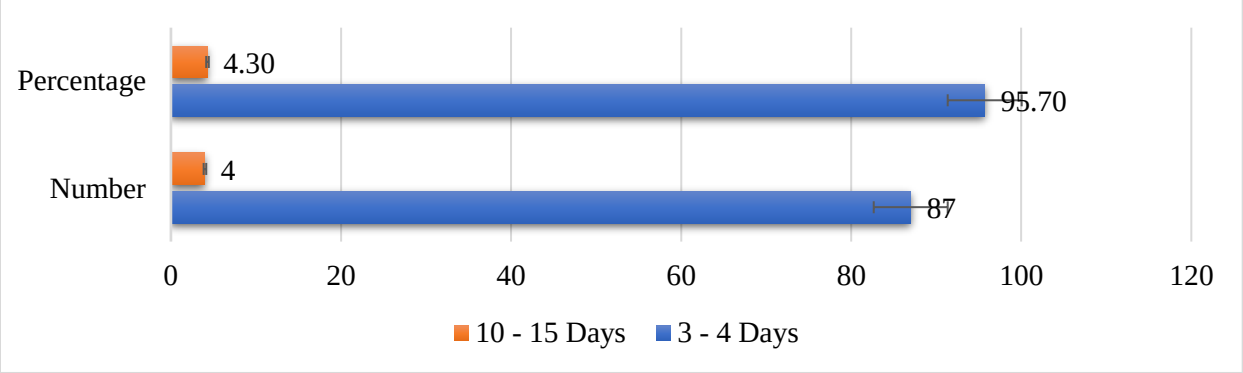


Table – III: Hospitalization Duration

Hospital Stay	Number	Percentage
3 – 4 Days	87	95.70
10 – 15 Days	4	4.30



DISCUSSION:

There are traditional references for using phototherapy and exchange transfusion in order to treat and avoid Jaundice and its associated neurological disorders. Numerous risk factors are also connected with exchange transfusion; whereas, the intravenous immunoglobulin is an alternative to treat the patients of iso-immune hemolytic jaundice. Intravenous immunoglobulin is capable to reduce the aroused requirement of exchange transfusion [4].

By using an anti-D prophylaxis in Rhesus negative females markedly decreased hemolytic disease and rhesus sensitization in neonates; whereas, sensitization can possibly cause despite anti-D immunoglobulin, in the case of late management or in case of an insufficient drug dose. Therefore, Jaundice is very much common because of the hemolytic reasons [5 – 8].

IVIG is one of the emergent treatment components to treat the patients diagnosed with iso-immune hemolytic jaundice. IVIG also reduce the associated risk factors as it replaces the need of exchange transfusion. Various research studies conducted on the topic of exchange transfusion safety also report that mortality has an association with the exchange transfusion if it occurs in the timespan of six-hours

[4]. Premature babies and sick babies also die because of exchange transfusion; whereas, in the case of healthy and full-terms babies these occurrences are rare. Exchange transfusion has many associated complications but morbidity rates are not that much high according to the available literary references as it varies from 2.8% to 5.2% in every procedure [3].

The objective and goal of opting IVIG are that iso-immune hemolysis RBCs destroy because of the antibody-dependent cytotoxic process which is facilitated through neonatal reticuloendothelial system FC bearing cells. IVIG action mechanism is a non-specific FC receptors blockage. Level of the Carboxyhemoglobin also sensitively indicate the hemolysis index and various research studies also show a decrease in its level after the management through IVIG; which resultantly indicate that immunoglobulin can potently decrease the incidence of hemolysis [4]. There may be a possible role of IVIG in exchange transfusion parental refusal or in the non-availability of appropriate blood components to carry out the treatment through exchange transfusion.

According to the recommendation of the Pediatrics Society of America, a dose of (0.5 – 1) gm/kg of IVIG is sufficient for the newborns diagnosed with hemolytic jaundice [2]. With reference to other research studies our drug dose was less as we used (0.5 gm/kg) if IVIG in terms of phototherapy duration, hospital stay and in the requirement of exchange transfusion [2]. Exchange transfusion incidence was less with decreased hospitalization in this research as reported in numerous other studies [2, 3, 9 – 15].

No significant variation was there among double source phototherapy and IVIG among the patients of ABO hemolytic disease [11]. According to a Turkish author, the hospital stays and phototherapy duration was less in the patients treated with IVIG [10]. There was a difference in terms of blood transfusion with reference to other published research studies [2 – 4, 11, 12].

We did not encounter any such IVIG side effects like allergy, sepsis, disease transmission, hemolysis, hypoglycemia, acute renal failure and hypocalcemia [4]. Lone terms findings of hearing loss, cerebral palsy and kernicterus had not been the objective of assessment of other research studies. There are obvious and vivid advantages of IVIG than exchange transfusion as it is easy to administer and less invasive disease management.

CONCLUSION:

We conclude that effectiveness and safety of intravenous immunoglobulin to treat RH & ABO hemolytic jaundice diagnosed patients is better in order to decrease hemolysis, level of serum bilirubin and the exchange transfusion requirements.

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