Blood Transfusion Reactions in Children

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Summary

Experience with blood transfusion in the Paediatrics Department, Postgraduate Medical Institute has been analysed. Untoward reactions in 350 blood transfusions have been given in detail. Comparison of these reactions with literature has been done. It is concluded that serious reactions are not that high in our country and that minor reactions can be further avoided if modern blood banking techniques are provided to all the hospitals.

Introduction

Anaemia is a common problem in children of our country that are admitted to the paediatric units. Many of these anaemic children require blood transfusion besides other management. Blood transfusion is a life saving treatment but sometimes untoward reactions may occur. We transfuse many children in the department of Paediatrics, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar. This paper deals with our experience with blood transfusion in children and its untoward reactions.

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Material and Methods

350 blood transfusions were given in the department of Paediatrics in a period of seven months. Blood transfusions and exchange transfusion done in our nursery are excluded. On admission, Hemoglobin estimation was done and blood was drawn for grouping and crossmatching and the parents were persuaded to donate their own blood. The amount of blood for transfusion was calculated as 20 to 30 cc per Kg body weight for whole blood and 10 to 15 cc per Kg body weight for packed cells when indicated. Before starting blood transfusions, temperature of the patients was checked. For the first hour, the transfusion was given slowly, to watch for any reaction, in the presence of a Doctor or a Nurse. Blood transfusion at the night were avoided except in emergency. The total blood was given in 6–8 hours. If any untoward reaction occurred, blood transfusion was stopped immediately and blood sent back to blood bank for recross-matching. In cases with severe anaemia and signs of cardiac decompensation, blood was given very slowly, preceded by injection lasix (1–2 mg Kg–body weight).

Out of 350 blood transfusions, 194 (55.42%) were given in children from 0–2 years of age, 87 (24.85%) in 2–5 years of age and 69 (19.74%) were transfused over the age of 5 years. The age range was from 2 months to a maximum of 13 years. Males were 203 (58.5%) and females 147 (41.5%). The blood group in these patients is given in Table I. The maximum blood transfusions were given in group B, followed by group A and O. Minimum blood transfusions were given in AB group.

TABLE I.

CORRELATION OF BLOOD GROUPS AND BLOOD TRANSFUSION CASES

Group	No. of cases	Percentage
B+ve	118	33.7 %
B—ve	6	1.72%
A+ve	95	27.14%
A—ve	7	2.00%
O+ve	85	24.28%
O—ve	5	1.42%
AB+ve	31	8.85%
AB—ve	3	0.85%
Total	350	100 %

Rh—ve = 5.41%

The disease pattern for which blood transfusion is given is shown in Table II. All these provisional diagnoses were on admission, therefore there may be some mixed anaemias in the group of infection and nutritional anaemias alongwith worm infestation. All haemophilias were factor VIII deficiency. The group of malignancy consisted of acute leukemias 11 (3.14%), Hodgkin's disease 4 (1.14%) and neuroblastoma 3 (0.85%). The group of purpura consisted of Von-Willebrand's disease 7 (2%), Idiopathic thrombocytopenic purpura 6 (1.71%) and Henoch-Schonleen purpura 1 (0.28%). The miscellaneous group consisted of rheumatic fever, aplastic anaemia, liver abscess, osteopetrosis, hepatosplenomegaly of unknown aetiology, rheumatoid arthritis and nephrotic syndrome.

TABLE II.

DISEASE PATTERN IN BLOOD TRANSFUSION CASES

Diseases	No. of cases	Percentage
Anaemias of infection (acute or chronic)	106	30.08%
Thalassemia major	85	24.08%
Nutritional anaemia	58	16.57%
Acute haemolytic crises (Haemoglobinurea)	30	8.57%
Haemophilia	13	3.71%
Malignancy	18	5.14%
Purpura	14	4.0 %
Miscellaneous	26	7.42%
Total	350	100 %

The untoward reactions of blood transfusion are given in Table III. As shown in the Table, 8.57% had mild temperature rise while, out of 30 cases of hyperpyrexia, 10 had rigors and chills. The patient with haemolysis developed jaundice and haemoglobinurea and died in 36 hours. This could have been the only mismatched blood transfusion: however re-typing could not be done. In 15 patients the blood was discontinued due to hyperpyrexia; the re-typing was done and the blood was compatible and the patient was re-transfused. The blood was changed in only 4 cases because the blood was old and clotted in the tubes. In 20 cases of blood transfusions, antihistamines were given. In 8 cases, steriods were given with antihistamines. There was one case with cold agglutinins in the blood who was not transfused and is excluded from the study.

TABLE III.

UNTOWARD REACTIONS OF BLOOD TRANSFUSION

Reactions	No. of cases	Percentage
Temperature of 1–2°C above normal	30	8.57%
Hyperpyrexia. Temp. above 40°C	30	8.57%
Rash	9	2.57%
Itching	6	1.57%
Haemolysis with Jaundice and Haemoglobinurea	1	0.28%
Total	76	21.56%

Discussion

We have observed some interesting points in this study. Over half of the children (55.42%), who required blood transfusions, were under the age of 2 years, indicating their susceptibility to anaemias because of their age, genetic factors, infections and nutritional deficiencies. Males were more than females because they are brought early while the females are neglected by the parents.

The blood groups of these patients are compared with the pattern of blood groups of normal population in Hazara,[3] U.K.[1] and U.S.A.[4]: the comparison is given in Table IV. The normal pattern of blood group distribution is similar in different countries including Pakistan. In our cases the difference is probably due to the fact that our figures are taken from diseased children. The Rh. negative group 5.40% is similar to the pattern of blood groups in Hazara i.e 5.6%.[1]

TABLE IV.

PATTERN OF BLOOD GROUPS IN DIFFERENT COUNTRIES (PERCENTAGE)

Groups	Hazara (Pak) (Ref. 1)	U.K. (Ref. 2)	U.S.A. (Ref. 3)	Our Study
O	33	47	45	25.7
A	24	42	40	29.14
B	32	8	10	34.84
AB	11	3	5	9.7

The pattern of diseases, for which blood transfusion was given, is similar to our previous study carried out in the same Institute a few years ago.[2]

All reactions of mild to severe nature occurred in 21.5% of cases while the remaining patients received uneventful blood transfusion. Severe reactions, for which blood transfusion was discontinued, occurred in 20 cases (4.28%). Death occurred in only one case giving a mortality of 0.28%. Transfusion reactions are compared with other papers in literature as given in Table V.

TABLE V.

COMPARISON OF TRANSFUSION REACTIONS

Reactions	Our Study	Wintrobe	Ramgren
Pyrexia	17.14%	1–5%	0.65–19.8%
Urticaria	4.14%	0.8–1.1%	—
Haemolysis	0.28%	0.1–0.5%	—

From this study it is evident that we did not have many serious complications. Mild reactions like pyrexia and urticaria were more common than in other reported papers. This can be explained due to the fact that our blood bank facilities are not highly sophisticated and screening for antibodies cannot be done accurately.

Many diseases can be transmitted to the recepient via blood transfusion e.g., malaria, syphilis, hepatitis, brucellosis, AIDS. Bacterial sepsis, thrombophlebitis, air embolism and hemosiderosis may occur with repeated blood transfusion. It is of utmost importance that modern blood transfusion technology should be available to all hospitals in order to minimize even the most minor untoward reactions.

References

1. De-Gruchy, G.C. (1978): Clinical hematology in Medical practice, 4th edit. Oxford Blackwell Scientific; 782.
2. Imran, M., et al: Gross anemia in children: A Report of 200 cases. Abstract of papers.
3. Khaliq, M.A., et al: Frequency of ABO & Rh (D) Blood groups in Hazara Div. Abbottabad. Pak. Journal of Medical Research; 23: 4, 102—104.
4. Linman, J.W.: Hematology: Physiologic, Pathophysiologic and Clinical Principles. New York McMillan; 978.
5. Ramgren, O., et al. (1958): Immediate non-hemolytic reaction to blood transfusion. Acta Med., Scandinav; 162—211.