Research Paper

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The efficacy and safety of predonated autologous blood transfusion in elective orthopaedic surgeries.

Medical Sciences

KEYWORDS : Autologous transfusion, Orthopaedic surgery, Blood, Hemoglobin

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ABSTRACT

Safest blood a patient can receive is his own. Therefore, autologous blood transfusion is required to be revisited. Blood collected from a patient and retranfusion into same individual is called autologous blood transfusion. There are numerous advantages of autologous transfusion. Cross matching is not required, iso-immunization to a foreign protein is excluded, allogenic blood is conserved for those who need it particularly in emergencies and the fear of transfusion transmissible disease can be ignored. This study was done on patients of orthopaedics department of Government Medical College Jammu from December 2013 to January 2015. Total 25 cases were included out of which 21 were male and 4 were female. Each patient was planned for phlebotomy 5-7 days before the elective surgery. 16 patients (64%) were transfused autologous blood during surgery and 9 patients (36%) were transfused on first post operative day. Average pre phlebotomy hemoglobin was found to be 11.4 g%. Average 2nd day post phlebotomy Hemoglobin is found to be 10.3 g% and average 3rd day post phlebotomy hemoglobin is found to be 10.1 g%. Average 2nd post operative week hemoglobin was 11.3 g% and average 6th post operative week hemoglobin was 11.6 g%. This is normal value of hemoglobin which is higher than pre phlebotomy value, so this shows advantage of pre deposit autologous transfusion in elective surgery. Mild adverse reactions were found in 2 patients. In conclusion, autologous blood transfusion is safe, effective and economical, with benefits for the patient.

INTRODUCTION

There has been considerable advancement in surgical transfusion practices worldwide. Advancement in technology and increasing use of specific blood component has resulted in the evolution of safer surgical practices. Quest for safe blood transfusion has remained a prime concern. Allogeneic blood transfusions carry some risk of complications, such as transmission of viral infections, transfusion reactions, alloimmunization and immune suppression. Various methods have been used to reduce allogeneic blood transfusion requirements such as preoperative autologous blood donation (PABD), acute normovolemic haemodilution and use of pharmacological agents, iron or recombinant human erythropoietin (rHuEPO). Safest blood a patient can receive is his own. Therefore, autologous blood transfusion is required to be revisited. Blood collected from a patient and retranfusion into same individual is called autologous blood transfusion. Autologous blood can be stored by freezing it. Frozen units are stored at temperature not more than -65 degree Celsius with glycerol added as cryoprotective agent. Frozen red cells are thawed and glycerol removed by washing before transfusing the patient. One unit of autologous blood can be donated every 72 hours provided that the hematocrit remains higher than 33 percent.

There are numerous advantages of autologous transfusion. Autologous blood transfusion is extremely safe. Cross matching is not required, iso-immunization to a foreign protein is excluded, allogenic blood is conserved for those who need it particularly in emergencies and the fear of transfusion transmissible disease can be ignored. Other advantages of phlebotomy are early reticulocytosis and accelerated erythropoiesis. These patients are in the state of maximum stimulation of blood forming cells at the time of surgery so lag period between blood loss and stimulation of blood formation is reduced. As plasma value is completely replaced in 72hrs, there is relative hemodilution, so better perfusion of tissue and reduced incidence of post operative thrombosis. For rare blood groups it is difficult to find donor so autologous transfusion can be very helpful in rare blood groups.

Aims and objectives

To find out advantages of autologous blood tansfusion in elective surgery and also to find out its disadvanges.

MATERIAL AND METHODS

This study was done on patients of orthopaedics department of Government Medical College Jammu from December 2013 to January 2015. Total 25 cases were included out of which 21 were male and 4 were female. Each patient was planned for phlebotomy 5-7 days before the elective surgery.

Inclusion criteria:

- Patients with haemoglobin more than 11gm/dl.
- Age 20 to 50 years.
- Patients posted for elective surgeries.
- Normotensive patients.
- Only one transfusion anticipated.

Exclusion criteria:

- Patients with haemoglobin less than 11gm/dl.
- Patients who were suffering from cardiopulmonary and chronic renal disease and patients who had history of epileptic fits, hypertension or hypotension.
- Patients in whom multiple transfusions are anticipated.

Following investigations were done: Hemoglobin (by Sahl's method), haemocrit (determined by wintrobe technique), reticulocyte count done by suprvital dye staining of blood, peripheral blood film, ESR, bleeding time, clotting time, prothrombin time index, platelet count, renal function test, liver function tests, blood sugar, serology for HBsAg, HCV, HIV, blood grouping and RH factor.

After getting proper history, examination and investigations written consent was taken and phlebotomy was done before surgery. All patients were bleeded with 18 gauge needle, 300 ml of blood collected in plastic bags containing preservative in hematology department. Patient's blood pressure and pluse

were recorded and monitored during phlebotomy and adverse effects were noted and classified according to American Red Cross criteria. Mild group include pallor, disphore, anxiety, light headache, tachypnoea and anxiety. Moderate group include progression from mild to unconsciousness. Severe group include unconsciousness to convulsions.

Stored blood was tested for hepatitis B, hepatitis C and HIV. Patients were subjected to phlebotomy 5-7 day before planned surgery. Autologous blood was used during surgery or on first post operative day. On 2nd and 3rd day after phlebotomy following investigations were done: hemoglobin, hematocrit, reticulocyte count, bleeding time, clotting time, PTI and platelet count. These tests again were done on 2nd and 6 weeks after surgery.

OBSERVATIONS

Total 25 cases were included out of which 21 were male and 4 were female. Mean age of the patients was 36 years, range (20-50) years. Age wise distribution is shown in Table No 1 and number of patients having different indications for surgery are shown in Table no 2. None of the patients had any associated co morbid condition. 16 patients (64%) were transfused autologous blood during surgery and 9 patients (36%) were transfused on first post operative day.

Table no 1

Age gp patient	No. of patients
10-19	2
20-29	11
30-39	9
40-49	3

Table no 2

Nature of case	No of patient	Management
Shaft of femur fracture	11	Interlocking nail with close or open reduction
Disc prolapsed	9	Decompression
Humerus fracture	5	Open reduction with plating

Average pre phlebotomy hemoglobin was found to be 11.4 g%. Average 2nd day post phlebotomy hemoglobin was found to be 10.3 g%. So there is 1.1 gm% fall in hemoglobin after single phlebotomy. Average 3rd day post phlebotomy hemoglobin was found to be 10.1 g%. So there is further fall in hemoglobin on 3rd day. On 2nd week follow up in out patient department hemoglobin was again estimated. Average 2nd week post phlebotomy hemoglobin was 11.3 g%. So hemoglobin started raising and almost similar to pre phlebotomy hemoglobin. Average 6 week post phlebotomy hemoglobin was 11.6 g%. This is normal value of Hemoglobin which is higher than pre phlebotomy value. So this shows advantage of pre deposit autologous transfusion in elective surgery. Mild adverse reactions were found in 2 patients. None of the patients had any severe adverse reactions.

Discussion

The first attempt of autologous transfusion was made with re-infusion of washed blood with the purpose of surgical and obstetrical patient's resuscitation. The first reference of blood-saving is indexed in the American bibliography in 1917. In our study it is found that patients who are anticipated for 1 unit of transfusion can be chosen for autologous transfusion. Patient needs to have hemoglobin more than 11 g% and hematocrit 34, patient should not have cardiopulmonary disease, chronic renal failure, hypotension or hypertension, epileptic convulsion and acute bacterial infection. Age of the patients included in the present study was from 20 to 50 years, and 25 patients were included. George Milles et al (1962), selected 53 patients who were between 20 to 47 years.

According to Bernard Fantus (1937), any patient who is to undergo elective surgery can deposit blood 1-2 week before surgery to have it available in case it is needed during or after the operation. In our study autologous blood transfusion patients are usually bleeded 5-7 days before surgery and in all cases only one phlebotomy of 300ml was done. In present study all patients were given oral iron and continued 1 month after operation. We found mild adverse reaction of donation in 2 patients and no severe adverse reactions at all. These findings were identical with other studies when compared. Cowell at al (1972), reported 9.9 % mild and 0 severe reactions.

SUMMERY AND CONCLUSION

In present study 25 patients of elective surgery were included. All patients had hemoglobin more than 11 before surgery. Haemoglobin checked on 2nd post phlebotomy, 3rd post phlebotomy, after 2nd and 6th post operative week of follow up. Autologous transfusion decreases chances of transmission of infections. Rare groups can be benefitted to whom it is difficult to find donor for transfusion. Chances of mismatch reactions are reduced. Lag period between blood loss and stimulation of blood formation is reduced. It has no disadvantages and gives sense of confidence and satisfaction to patient. In conclusion, autologous blood transfusion is safe, effective and economical, with benefits for the patient. It is a procedure that can easily be adopted in any hospital

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