

AUTOLOGOUS BLOOD DONATION AND TRANSFUSION IN OBSTETRICS AND GYNAECOLOGY AT THE UNIVERSITY OF MAIDUGURI TEACHING HOSPITAL MAIDUGURI, NIGERIA.

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ABSTRACT

Objective: To evaluate the practicability of autologous blood donation and transfusion in the practice of obstetrics and gynaecology in our environment.

Method: A prospective study of 1221 obstetric and gynaecological patients to which autologous blood donation and transfusion was carried out at the University of Maiduguri Teaching Hospital, Maiduguri over an 8 year period (January, 1998 to December, 2005).

Results: During the study period, there were 15,267 blood transfusions in the UMTH out of which 5,711 were for Obstetric and Gynaecological patients given a transfusion rate of 47.7% in the unit. Out of the 5711 transfusion in the obstetrics and gynaecology, 1221 were by autologous means; a rate of 21.4%. Of the 3010 transfusion in obstetrics 625 (20.7%) were of autologous blood and of the 2711 transfusion in gynaecological patients 596 (22.1%) were of autologous blood. Preoperative blood donation was done in 598 (95.8%) of the obstetrics autologous blood donation out of which, 40 (6.4%) predeposited 2 units. Five hundred and sixty (94.1%) gynaecological patients had preoperative blood donation out of which, 46 (7.7%) predeposited 2 units. Induction of labour constitutes the major indication 337 (53.9%) for the autologous blood donation in obstetric while the major indication in gynaecology patients was myomectomy (25.7%). The main complications encountered were dizziness, and fainting attack that necessitated re-infusion in one patient.

Conclusion: Autologous blood donation and transfusion procedure is feasible in the setting of obstetrics and gynaecology and it does not require high technical procedure.

Key Words: Blood Donation, Autologous, Homologous, Transfusion, Obstetric and Gynaecology, Complications.
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INTRODUCTION

Haemorrhage and blood transfusion are two events that influence life as a whole in a dramatic manner especially in the practice of Obstetrics and Gynaecology. Greater proportion of maternal death occurred because of obstetrics haemorrhage and intraoperative and postoperative haemorrhage constitutes a major morbidity and in some cases mortality in gynaecological patients. In Nigeria for example obstetric haemorrhage is the leading cause of maternal death while in Maiduguri it is only second to hypertensive disorders as a cause of maternal death^{1,2}. The best treatment of haemorrhage is by blood transfusion after control of bleeding^{3,4}.

While haemorrhage is associated with serious morbidity or mortality if unabated, blood transfusions on the other hand correct morbidity, improves quality of life and prevent mortality.

Blood transfusion could be autologous or

homologous but the most important aspect of blood transfusion is safety. It is pertinent to note that "unsafe blood transfusion" can be more dangerous than no blood at all⁵. The discovery of blood type and method of preventing coagulation allowed the development of homologous blood transfusion and the formation of the system of blood banks⁶. Homologous blood transfusion had assumed an increasing important role in modern medical and surgical management of patients but it could be associated with complications like transfusion reaction, mismatched blood transfusion and transmission of diseases like human immunodeficiency syndrome (HIV) and hepatitis^{6,7}. In addition, homologous blood donation does not only require regular donors but also encourages paid donors. This is a major set back in developing countries where majority of those that require blood might not meet up with the financial demand of acquiring homologous blood. A cheap and alternative source of blood for patients is autologous blood donation⁸.

Autologous blood donation is the collection of the patient's own blood or blood component for subsequent re-infusion⁹. Autologous blood compare

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to homologous blood, has the advantage of being immediately available and eliminating the risk of contracting blood borne pathogens and exposure to foreign antigens. It can also compliment homologous blood supply^{8,10}. Autologous blood donation can be accomplished by any of the following methods; Preoperative autologous blood donation (PABD), immediate preoperative phlebotomy and isovolaemic haemodilution (IPPIV), intraoperative blood salvage (IOS) and postoperative blood salvage (POS).

Autologous blood donation is suitable for all healthy adults meeting the world health organization (WHO) and the international society of transfusion criteria; body weight of greater or equal to 48kg, age of 18-65 years and PCV of 34% and above. Pregnant women that meet above criteria can donate blood safely especially in the second and third trimesters^{8,11}. Despite its recognized benefits and success, autologous blood donation is yet to become wide spread in many countries.

The aim of this study was to evaluate the practicability of autologous blood donation and transfusion in the practice of obstetrics and gynaecology in our environment.

MATERIALS AND METHOD

This is a prospective study of 1221 obstetric and gynaecological patients to which autologous blood donation and transfusion was done at the university of Maiduguri teaching hospital, Maiduguri over an 8 year period (January, 1998 to December, 2005). Cases included were healthy and physically fit women between the ages of 18-50 years, weighing 48 kg and above with a packed cell volume of 34% and above. In addition, all obstetrics patient were in second or third trimester. Preoperative blood donation, immediate preoperative phlebotomy and isovolaemic haemodilution and intraoperative blood salvage were the type of autologous blood donation and transfusion done.

Prior to recruitment, all patients were counselled on the benefits and drawbacks of autologous blood donation and transfusion and the dangers of homologous blood and their consent obtained for the study. Phlebotomy was carried out according to the guidelines established by the American medical association endorsed by WHO following clinical evaluation for vital signs and in case of obstetrics patient's fetal heart rate. First donation in obstetrics patients was at 34 weeks and a second donation at 36-37 weeks. In emergency situations immediate phlebotomy and isovolaemic haemodilution was performed were appropriate. Maternal and fetal conditions were monitored every 5 minute during the blood donation period. For gynaecological patients' predispositions was started 4 weeks prior to surgery and continue on weekly basis with the last donation

at least a week before the time of the planned surgery. For emergency cases immediate phlebotomy and isovolaemic haemodilution was performed and intraoperative blood salvage employed in the appropriate cases e.g. in patients with ruptured ectopic pregnancy.

In all cases of pre deposit autologous blood donation, the patients were observed for 30 minute after the procedure and were complications occurred they were managed accordingly. Aggressive administration of haematinics was done with ferrous sulphate 200mg 8 hourly, folic acid 5mg daily, ascorbic acid 100mg 8 hourly and vitamin B complex tablet 12 hourly starting a week before the first phlebotomy continuing through out the period of the blood donation.

All collected samples were labelled with the patients name, age and hospital number and the inscription "for autologous blood transfusion only" to avoid clerical errors. In case where surgery was delayed or postponed the oldest pre donated units were serially re-infused to the donor and fresh units drawn "leaf frog" technique. Donated bloods not used by the patients were transferred to the homologous blood bank after the patient gave consent for such. The data collected include the type of autologous blood donation, number of unit donated/transfused, indication for the autologous blood donation and the complications that developed. The data were analyzed using percentages and proportions.

RESULTS

During the study period there were 15,267 blood transfusions in the UMTH out of which 5,711 were for obstetrics and gynaecological patients given a transfusion rate in obstetrics and gynaecology of 47.7%. Three thousand and ten (25.1%) of those were for obstetrics patients while 2710 (22.6%) were for gynaecological patients.

Out of the 5711 transfusion in the obstetrics and gynaecology, 1221 were by autologous means; a rate of 21.4%. Of the 3010 transfusion in obstetrics 625 (20.7%) were of autologous blood and of the 2710 transfusion in gynaecological patients 596 (22.1%) were of autologous blood.

Table 1 shows the types of autologous blood donation in the study population. Preoperative blood donation was done in 598 (95.8%) of the obstetrics autologous blood donation while immediate preoperative phlebotomy and isovolaemic haemodilution was done in 26 cases (4.2%). Five hundred and sixty (94.1%) gynaecological patients had preoperative blood donation, 30 (5.0%) had immediate preoperative phlebotomy and isovolaemic haemodilution and 5 (0.9%) intraoperative blood salvage.

Table 2 shows the number of units of autologous

blood donated per patient. In obstetrics patients, 562(90.1%) predeposited 1 unit, 40 (6.4%) predeposited 2 units and 1 patient (0.2%) predeposited 3 units. All the 21 obstetrics immediate preoperative phlebotomy and isovolaemic haemodilution was of 1 unit. In gynaecological patients 517 (86.1%) predeposited 1 unit, 46 (7.7%) predeposited 2 units and 1 unit of blood was obtained in 30 patients (5.0%) through immediate preoperative phlebotomy and isovolaemic haemodilution. Intra operative salvage of 1 unit each was done in 5 patients (0.9%).

Table 3 depicts the obstetrics indications of the autologous blood donation and transfusion in the study population. Induction of labour constitutes the major indication (53.9%) followed by elective caesarean section (34.7%). In 63 patients (10.1%) the indication was emergency caesarean section.

Table 4 shows the indication of the autologous blood donation and transfusion in the gynaecology patients in this study. In 227 patients (38.1%) the indication was myomectomy, in 153 (25.7%) the indication was total abdominal hysterectomy and in 65 patients (10.9%) the indication was vaginal hysterectomy.

The main complications encountered were dizziness (0.08%), and a fainting attack that necessitated re-infusion in one patient.

Table 1: Types of Autologous Blood Donation (ABT)

Type	Obstetrics	Gynaecology
PABD	598 (95.5%)	561 (94.1%)
IPPIV	26 (4.2%)	30 (5.0%)
IOS	Nil	5(0.9%)
POS	Nil	Nil
Total	624 (100%)	596 (100%)

PABD= preoperative autologous blood donation
 IPPIV= immediate preoperative phlebotomy and isovolaemic haemodilution
 IOS = intraoperative blood salvage
 POS = postoperative blood salvage

Table 2: Number of Units of Autologous Blood Donated.

Type	Obstetrics			Gynaecology		
	Number of unit/s donated			Number of unit/s donated		
	1	2	=3	1	2	=3
PABD	562	40	1	517	46	2
IPPIH	21	Nil	Nil	30	Nil	Nil
IOS	Nil	Nil	Nil	5	Nil	Nil
POS	Nil	Nil	Nil	Nil	Nil	Nil

Table 3: Indications for Autologous Blood Donation in Obstetrics Patients.

Indications	Frequency	Percentage
Induction of labour	337	53.9
Rh – isoimmunisation	10	1.6
Postdate	102	11.3
Pregnancy induced hypertension	145	23.2
Intrauterine growth restrictions	20	3.2
Premature rupture of fetal membranes	31	5.0
Trial of scar	16	2.6
Previous stillbirth	7	1.1
Conflicting dates	6	1.0
Elective CS	217	34.7
Emergency CS	63	10.1
Retained placenta	3	0.5
Others	5	0.8
Total	624	100

Table 4: Indications of Autologous Blood Donation in Gynaecology Patients.

Indications	Frequency	Percentage
Myomectomy	227	38.1
Total abdominal hysterectomy	153	25.7
Vaginal hysterectomy	65	10.9
Vesico-vaginal fistula	13	2.2
Recto-vaginal fistula	5	0.8
Ovarian cystectomy	47	7.9
Entopic pregnancy	13	2.2
Polypectomy	11	1.8
Vaginoplasty	4	0.7
Hymenectomy	5	0.8
Explorative laparotomy	13	2.2
Excision of vulval growth	4	0.7
Missed abortion	23	3.8
Others	13	2.2
Total	596	100

DISCUSSION

Homologous blood donation is associated with infectious and immunological risk. Autologous blood donation reduces homologous blood transfusion requirements considerably and is associated with significant cost reduction^{12,13}. Our study demonstrated that autologous blood donation and transfusion is safe and practicable in obstetrics and gynaecology similar to the reports of other studies^{6-8,11,14}. Similar to the report of another study in the same country,⁵ about half of the blood transfusions in our hospital during this study period was in obstetrics and gynaecology (47.7%). The autologous blood donation rate of 21.4% in our study was lower than those reported from other studies,^{15,16}

and this was probably because the procedure is only rarely utilized in our department before this study. The commonest autologous blood method in this study was preoperative autologous blood donation (in 95.8% of the obstetrics patients and 94.1% of gynaecology patients), which was found to be the most effective among the autologous blood donation methods¹⁷. An interesting finding was the demonstration of the feasibility and safety of immediate phlebotomy and isovolaemic haemodilution in obstetrics patients. The procedure was successfully done in 4.2% of the obstetrics population in our study without any complication. The blood volume expansion in pregnant patients which was thought to guide against the possibility of blood loss during delivery might well make immediate phlebotomy and isovolaemic haemodilution safe and the blood withdrawn can be re-infused back which will at least in theory decrease the homologous blood transfusion needs. In fact all our patients that had the procedure have had their blood re-transfused back to them and none require additional homologous blood transfusion. Similar to the report of another study¹⁸ our patients donated 1-3 units of autologous blood, which contrast with the report of a study in which all the patients donated 3 units. Majority of our patients predonated 1 unit of blood. This may not be unrelated to the shorter timing from recruitment to surgery in our study. The predonation was started at 36 weeks of gestation in obstetrics patients and three weeks before surgery in gynaecology patients. The predonation in this study was carried out at weekly interval similar to the report of other studies^{19,20} although some suggested a shorter interval of 3 days²¹. Only one unit of blood was donated at a time, similar to what was done in other studies¹⁶⁻¹⁸. In contrast another study showed that one double deposit was safe and was even associated with increased RBC mass compared to two separately collected units' deposits¹². In all the patients that had predonation, iron tablets were prescribed to boost their haemopoietic capacity. Majority of the indications for autologous blood donation in obstetrics patients in our study (53.7%) was for induction of labour in contrast to the report of another study, which shows caesarean section to be the major indication for the autologous blood donation²². Caesarean section was the second major indication (44.8%) in this study. The major indication of autologous blood donation in gynaecology patients was for myomectomy and hysterectomy in our study. This was similar to the reports of other studies^{18,23}. This was because they were the most common gynaecological operations in many tertiary centers.

Similar to the report of other studies,^{15,22} 53.7% of the autologous blood was transfused to the patients, which was however lower than the re-transfusion rate of 73% reported from another study¹⁶. This re-transfusion rate was low taking into account that 23.9% of our patients required additional homologous blood transfusion which was higher than the additional homologous blood transfusion rate reported by other studies^{16,23}. This may be because those patients requiring the additional homologous blood transfusion were close to the transfusion trigger of Haemoglobin level of 9.0g/dl at recruitment and were only able to donate one unit of autologous blood. In fact anaemia is very common in our environment and majority of our patients population have a PCV that was only slightly above the cut off of 34%. Only few complications (in 0.08% of the patients) were seen in this study and most of which were mild dizziness with only a single gynaecology patient that develop fainting attack necessitating re-infusion of the collected blood. No fetal complication was observed in the obstetrics population.

In conclusion, our study showed that autologous blood donation and transfusion procedure is well tolerated and feasible in the setting of obstetrics and gynaecology. It also decreased the homologous blood donation rate significantly and its associated risk of infection transmission. Fifty three percent of the autologous blood re-transfusion would have been of homologous blood if the procedure was not done. But there is the need for mass education of the patients and practitioners alike on the benefit of autologous blood donation.

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