East African Medical Journal Vol. 95 No. 2 February 2018
AUTOLOGOUS BLOOD DONATIONS AND TRANSFUSIONS AMONG PATIENTS UNDERGOING ELECTIVE ORTHOPAEDIC, GYNAECOLOGIC AND ELECTIVE CAESAREAN SECTION AT A TERTIARY HOSPITAL IN NORTH CENTRAL NIGERIA

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ABSTRACT

Introduction: **Allogeneic donor blood is becoming increasingly costly, scarce and associated with multiple risks; there is need for more conservative transfusion strategies, one of which may be adoption of Autologous Blood Donation and Transfusions (ABDT). Despite increased acceptance of ABDT by clinicians and patients in most developed world, awareness in this part of the world is still low.**

Materials and methods: **this is a cross sectional survey of knowledge and acceptance of ABDT by patients scheduled for elective orthopaedic, gynaecologic and elective caesarean section surgeries using structured interviewer administered questionnaire on socio-demographics, clinical presentations, knowledge of blood donations and transfusions, and acceptance of ABDT. The study population comprised of 171 subjects.**

Results: **Gynaecologic/obstetric patients were 120 (70.2%) while 51 (29.8%) of the subjects were Orthopaedic patients. Majority (43.95%) were within the age range 31-45 years, 38.6% were less than 31 years while 17.5% were older than 45 years. Females constituted the larger proportion (77.2%). Twenty one (12.3%) subjects had donated blood in the past, 45 (26.3%) had previous blood transfusions and 30 (17.5%) had knowledge of ABDT. Eight one (47.4%) of all subjects accepted ABDT for the scheduled surgeries while 123 (71.9%) subjects accepted to be voluntary blood donors after surgery. Pre-deposit is the commonest form of ABDT preferred by the subjects (66%), followed by Haemodilution (28%) and Cell salvage (6%). A**

significant number of the subjects who accepted ABDT were ready to become voluntary blood donors after surgery (90.1%).

Conclusion: **Acceptance rate as high as 47.4% was recorded in this study despite low awareness. This is higher than what was reported by most authors' locally but similar to the findings from Europe and Asia. Pre-deposit form was the commonest ABDT acceptable to these patients. Improving awareness on ABDT will boost voluntary blood donations and improve blood transfusion safety.**

INTRODUCTION

Autologous Blood Donations and Transfusions (ABDT) can be defined as donation and subsequent reinfusion of patient's own blood or blood products, while allogeneic blood transfusion is the transfusion of blood and blood products donated by another individual to a recipient. Although, allogeneic blood transfusion is still the commoner and the more popular of the two, the concept of autologous blood donation and transfusion is at least sixty years old[1]. Allogeneic blood transfusion is presently more popular, well established and is of higher demand than autologous forms simply because of its convenience for blood banks for the provision of blood and blood products for emergency transfusions, major surgeries and routine blood transfusions.

Nowadays, evidence has shown that administration of allogeneic blood and blood products may not be totally beneficial or totally safe. Aside commonly cited complications; allogenic blood transfusions have also been linked to poor surgical outcomes[2], increased risk of infection[3], cancer recurrence[4], and acute lung injury[5]. Allogeneic donor blood is becoming increasingly costly, scarce and associated with multiple risks[6,7]. Because of these, there is need for more conservative transfusion strategies, one of which may be adoption of autologous blood transfusions for elective procedures.

Autologous blood donation and transfusion allows safer transfusion in patients with rare blood groups, prevents exposure of recipients to foreign antigens, reduces immune-suppression, accepted by some Jehovah's Witnesses and guarantees availability of blood or blood products for elective surgeries. Autologous blood donation and transfusion recipients can easily be converted to voluntary non-remunerated blood donors. Moderate blood losses during elective surgeries can be replenished by autologous donation and transfusion alone[8]. Salvage method is becoming increasingly cost effective for large volume losses during surgeries and with excellent long-standing safety record[9]. Most of the complications associated with allogeneic blood transfusion can be avoided in ABDT. In actual fact, it was anxiety over transfusion transmissible infections (TTIs) in general and HIV infection in particular that reawakened public and researchers interest in the field of ABDT[1]. Autologous blood donation and transfusion is not without its own demerits. Wastage of blood if surgeries are postponed beyond the shelf life of donated blood units, complex and specialized equipments for salvage method with a high initial capital expenditure and on-going costs of consumables[10] may be some of the disadvantages of ABDT.

Autologous blood donation and transfusion is also reserved for adult patients who are likely to need modest (2-4 units) of blood replacement before, during or after elective

surgeries and who are sufficiently fit to donate blood. Although orthopaedic and gynaecological surgeries are the two situations most likely to fulfill these requirements, patients with other elective surgeries like urological[11], general[12] and otorhinolaryngological[13] surgeries can also benefit from auto transfusions.

Acceptance rate for ABDT for as high as 90-100% has been reported by several authors[6]. Acceptance rate of 100% was found in a preliminary report of a study of Pre-operative isovolaemic haemodilution and autologous blood transfusion in elective adult orthopaedic surgeries at The Duchess of Kent Hospital in 1994[6].

As demand for this allogeneic blood transfusion is outstripping donation, there is a real social and economic pressure to increase the proportion of blood transfused by autologous method[14].

There are three forms of ABDT: Pre deposit, Haemodilution and Salvage. In Pre deposit, patient donates blood a few weeks (less than 5 weeks) before surgery and the blood is transfused during or after surgery. In Haemodilution, a predetermined volume of blood is withdrawn from the patient immediately prior to surgery and stored in the conventional method (i.e in the blood bank) while the patient's volume deficit is replaced with colloids. The stored blood is then transfused to the patient after surgery. In Salvage method, blood loss during surgery is collected, processed and re-transfused to the patient during or after the surgery.

This study was therefore justifiable in the presence of an increasing incidence of Transfusion Transmissible Infections (TTIs) and increasing scarcity of allogeneic blood in developing countries, more especially in Nigeria.

Establishing some level of awareness and acceptance rate of ABDT amongst patients will assist in setting up a functional ABDT service in our hospitals. The program will also complement Voluntary Non-remunerated Blood Donation which has been adjudged to be the safest form of autologous blood donation. Likewise, there will be elimination of touts as commercial donors from the voluntary blood donor pool in our blood banks.

METHODOLOGY

Study Design: This study was a cross sectional survey of knowledge and acceptance of ABDT by patients scheduled for elective orthopaedic and gynaecologic surgeries as well as caesarean deliveries. The instrument for the survey was a structured researcher-assisted questionnaire divided into sections on sociodemographic profile of participants, clinical presentations, medical history, general knowledge on blood donations and transfusions, attitude and past experience as well as acceptance of ABDT. The questionnaire was administered during clinic visits. A pilot study to test the reliability and validity of the designed tool amongst elective surgical cases was conducted using 10% of the calculated sample size. The questionnaire was corrected afterwards and participants in the pilot study were eliminated. All consenting patients seen in the out-patient orthopaedics and obstetrics/gynaecologic clinics during the study period eere recruited for the study.

Study Area: The study was conducted at the University of Ilorin Teaching Hospital (UITH), a tertiary health institution located in the North-Central geopolitical zone of Nigeria. The hospital serves an estimated population of 15,450,084 people[15]. Approximately 70 units of blood are grouped

and cross-matched while more than 100 prospective blood donors are attended to daily at the blood bank of the hospital.

Study Participants: The study population consisted of subjects with orthopaedics, obstetrics and gynaecologic indications who were being worked up for elective surgeral procedures.

Routine Procedure for Elective Surgeries at UITH: Gynaecological clinics are run by consultants and resident doctors from Tuesday to Friday every week. Gynaecological consultations are unrestricted and patients are referred from General Out Patient Department, other consultant clinics and peripheral hospitals. They are prepared and scheduled for surgery in the clinic and admitted 24-48 hours prior to surgery during which blood grouping and cross matching are done and 2-4 units of blood are made available for major gynaecological cases depending on the envisaged extent of surgery. On the average, 10 elective gynaecological operations are scheduled per week and annual caesarean section rate is 9.1%

Orthopaedic clinics are also run by consultant and resident doctors on Mondays and Tuesdays. Patients for elective surgeries are normally admitted at least 24 hours prior to the scheduled date of surgery. On admission, at least two units of blood are also cross matched for most major orthopaedic procedures depending on the envisaged blood loss at surgery.

Blood transfusion requirements are handled by the blood bank of the Haematology department of the hospital. A prospective donor donates blood after being subjected to and passing the routine of donor fitness testing, administration of standard questionnaire and rapid screening for transfusion transmissible infections (HIV I and II, Hepatitis B and C). The donated blood unit is later subjected to full ELISA screening for HIV 1 and II and Hepatitis B and C to increase the safety of blood transfusions.

All Consenting adult subjects seen in the aforementioned clinics who were being planned for elective surgeries and were eligible to donate blood or blood products were recruited for the study. All subjects who refused consent were excluded as well as emergency cases for surgical interventions that required blood transfusions as part of preoperative, intraoperative and/or postoperative management.

Ethical approval for this survey was obtained from the Ethical Committee of University of Ilorin Teaching hospital. After counseling, informed written consent was obtained from all subjects. Data analysis was done using IBM SPSS version 20. Results were described in percentages, proportions and means. Chi square and student T tests were used to compare variables. Level of significance was set at $p \leq 0.05$.

The study was funded by the researchers. The researchers declared no conflict of interest.

RESULTS

One hundred and seventy-one subjects were enrolled for the study, of which 120 (70.2%) and 51 (29.8%) respectively had Obstetrics/Gynaecologic and Orthopaedic indications for surgery. Of all the subjects 43.9% were of the age range 31-45 years, while 38.6%, 9.9% and 7.6% were of the age ranges 15-30years, 46-60years and above 60 years respectively. Females (77.2%) constituted the larger proportion, (Table 1)

Obstetric and Gynaecological indications for elective surgeries consisted of uterine fibroids (36{30%}), elective caesarian sections (22 {18.3%}), endometrial polyps (8 {6.7%}),

cervical cancers (8 {6.7%}) and others (46 {38.3%}). Orthopaedic indications consisted of fractures (21{41.2%}), Bone tumours (6 {11.8%}), trauma (6 {11.8%}), osteoarthritis (4 {7.8%}), recurrent Blount's disease (2 {3.9%}), gunshot injuries (2 {3.9%}), and others (10{19.6%}).

Twenty-one (12.3%) subjects had donated blood in the past, while 45 (26.3%) had previous blood transfusions and 30 (17.5%) had knowledge of ABDT, (Table 2)

Out of eight one (47.4%) of all subjects that accepted ABDT 52, (64.2%) had Obstetrics and Gynaecology indications while 29 (35.8%) had Orthopaedics indications for the current surgeries while out of 123 (71.9) of all subjects that accepted to become voluntary blood donors after surgery, 83 (67.5%) had Obstetrics and Gynaecology indications and 40 (32.5%) had orthopaedics indications, (Table 3 and Figure 1). Of all the subjects that accepted to donate autologously for their surgeries, 75 (92.6%) accepted to donate 1-2 units while 6 (7.4%) were ready to donate up to 3-4 units. Pre-deposit was the commonest form of ABDT preferred by the subjects (113, 66%), followed by Haemodilution (48, 28%) and Cell salvage (10, 6%), (Figure 2). A significant number of subjects that accepted ABDT were ready to become voluntary blood donors after surgery (73, 90.1%), p value 0.033.

Table 1

Age and Sex of all the subjects

Age (years):	**n (%)**
15-30	66 (38.6)
31-45	75 (43.9)
46-60	17 (9.9)
>60	13 (7.6)
TOTAL	171 (100)
Sex:	
Male	39 (22.8)
Female	132 (77.2)
TOTAL	171 (100)

Table 2

Blood Donations and Transfusions history, and acceptance of ABDT

Parameters:	**Yes** **n (%)**	**No** **n (%)**
Previous Blood Donation	21 (12.3)	150 (87.7)
Previous Blood Transfusion	45 (26.3)	126 (73.7)
Knowledge of ABDT	30 (17.5)	141 (82.5)
Acceptance of ABDT	81 (47.4%)	90 (52.6%)

Table 3

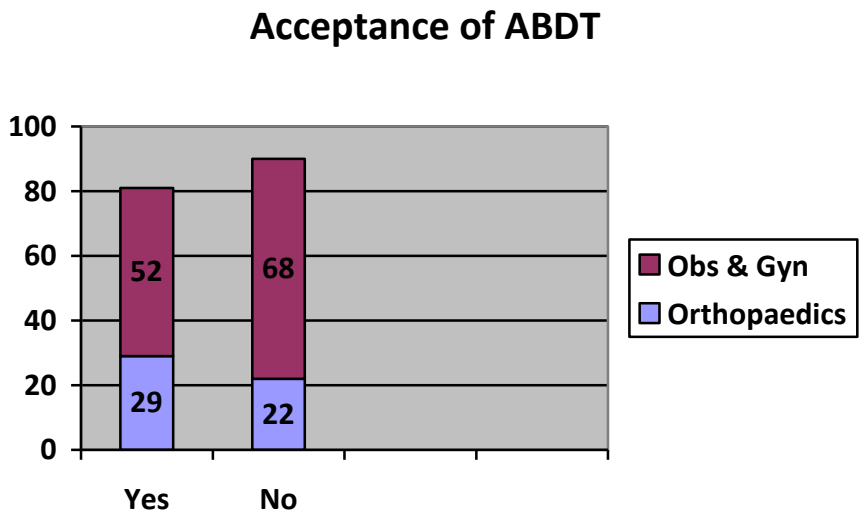
Acceptance of ABDT and VBD amongst all subjects

Parameters:	Indications	Accept n (%)	Reject n (%)
ABDT	Obs/Gynae	52 (64.2%)	68 (75.6)
	Orthopaedics	29 (35.8%)	22 (24.4%)
	TOTAL	81 (100)	90 (100)
VBD	Obs/Gynae	83 (67.5%)	37 (77.1%)
	Orthopaedics	40 (32.5%)	11 (22.9%)
	TOTAL	123 (100)	48 (100)

Table 5

Readiness to become Voluntary Blood Donors by 81 subjects who accepted ABDT

	n (%)	t	Sig. (2-tailed)	95% confidence interval	
				lower	upper
Total Ready to become VBD	73 (90.1%)	19.250	0.033	26.1752	127.8248
Total not Ready to become VBD	8 (9.9%)	1.219	0.437	-419.2765	508.2765



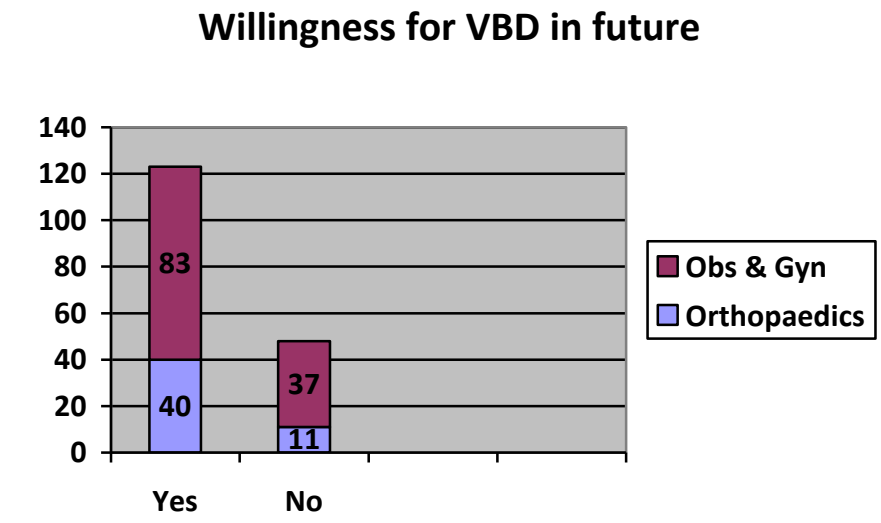
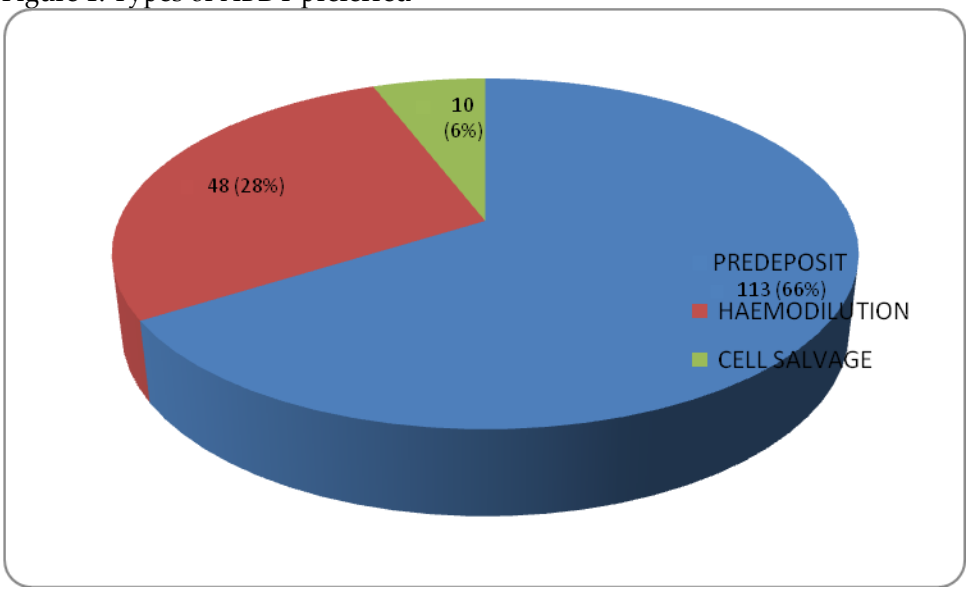


Figure 1: Types of ABDT preferred



DISCUSSION

Recently, in an attempt to prevent adverse side effects of exposure to allogeneic blood, the concept of Patient Blood Management (PBM) or blood conservation which aims to fully evaluate the patient's condition and the need for transfusion has gained special interest in the field of blood transfusions[16,17]. ABDT is an important approach to achieve PBM[18].

Knowledge of blood transfusions and acceptance of ABDT has grown steadily over the years globally. The number of institutions offering ABDT increased 16 fold from 1970 to 1981, according to American Association of Blood Bank (AABB) survey[19]. Acceptance by clinicians and patients has grown exponentially since then in most developed world.

Most of our patients in this part of the world still lack sufficient knowledge about ABDT as

only 30(17.5%) had previous knowledge of ABDT. This is similar to what was reported from most studies conducted locally and internationally[20]. However, the total acceptance rate of 47.4% for ABDT in this study seems higher than what was reported by most authors' locally[20] but similar to the findings from Europe and Asia[6]. It is noteworthy that the acceptance rate for ABDT is higher amongst patients going for orthopaedic surgeries than gynecological cases. This could be explained based on the erroneous belief in this part of the world that it is a taboo for women to donate blood. Most of our patients still accepted ABDT despite poor or low previous awareness. This means if patients are properly educated, significant number will accept ABDT and eventually become voluntary non remunerated blood donors.

Although autologous activity has increased many times in the last decade, Pre operative autologous donations alone increased 12 times since 1983[21]. Similarly, pre-deposit is the main form of ABDT preferred by most patients in this study. This is similar to what obtained in most other studies[16,17,18]. Most patients preferred to donate 1 to 2 units of blood as pre deposit.

For those patients that accepted ABDT, majority are ready to become voluntary non remunerated blood donors. This in effect can be used to increase Voluntary Blood Donor pool.

CONCLUSION

Awareness about ABDT is low among patients that required elective surgeries at UITH Ilorin. Acceptance of ABDT in this study was comparable with findings in other regions and pre-deposit form was the commonest ABDT acceptable to these patients. Improving awareness on ABDT will further boost voluntary blood donation and in effect improve safety of blood transfusions.

RECOMMENDATION

Appropriate educational program during intensive blood donation campaign has been found to increase Voluntary Blood Donor Pool, improving awareness on ABDT will further boost voluntary blood donation and in effect improve the safety of blood transfusions.

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