

# Knowledge and Attitude about Blood Donation and its subtype (autologous blood donation) among medical students in KSA

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**Abstract :** Blood donation and transfusion are remarkably lifesaving medical procedures. Autologous Blood donation which is called also self-donation is the collection and re-infusion of the patient's own Blood or Blood components. It should be transfusion therapy of choice, or at least, fully and carefully considered.

**Objectives:** to assess knowledge about blood donation and knowledge and attitude about autologous blood transfusion among medical students in different collages in KSA.

**Material and Methods: period of study** from 7 -1-1434 to 28-1-1434 . A cross-sectional study was conducted among 161 Medical Students, randomly selected from all years in different medical collages in KSA (UT, KSU, KKU and others universities) . a web based self-administrated , structured English questionnaire was used to test knowledge and attitude of medical students about blood donation and its subtype (autologous blood donation). The collected Data were entered and analyzed using Google document . **Results:** adequate knowledge about blood donation is only present in (68.0%) of students who gave right answers about the blood vessels used for blood donation and the harmful effect of blood donation as a procedure and for donor (84%), (80%) respectively. Regarding autologous blood donation, 55% of students doesn't hear about it, 74% doesn't Know its subtypes, 63% don't know about its benefit, 58% of students don't know that it is the safest way for donation of blood, 53% of students refuse undergo an autologous and 74% of students will not encouraged others to use this method. Recommendation: increasing awareness of the community as a whole and medical student in special about blood donation and its sub type (autologous blood transfusion).

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## INTRODUCTION

Blood donation and transfusion are remarkably lifesaving medical procedures for many individuals. The blood and blood components can be obtained from volunteer donors, direct donors, Paid donors, or through autologous donation

(1). A blood donation occurs when a person voluntarily has blood drawn and used for transfusions and/or made into biopharmaceutical medications by a process called fractionation (separation of whole-blood components). Donation may be of whole-blood (WB), or of specific components directly (the latter called apheresis). Blood banks often participate in the collection process as well as the procedures that follow it (2)

**Literature review** Autologous blood transfusion refers to transfusion of blood and/or blood components that are donated by the intended recipient (3). It is considered as one of the safest methods of blood transfusion (3,4). Different types of autologous blood include: preoperative blood deposit, preoperative haemodilution, intraoperative salvage, postoperative salvage and speculative predeposit (2).

Autologous blood transfusion is extremely safe. Cross matching is not required; iso-immunisation to foreign protein

is excluded; allogeneic blood is conserved for those who need it, particularly for emergencies; and the fear of transfusion transmissible disease can be ignored.(2)

Potential donors are evaluated for anything that might make their blood unsafe to use. The screening includes testing for diseases that can be transmitted by a blood transfusion, including HIV and viral hepatitis. The donor must also answer questions about medical history and take a short physical examination to make sure the donation is not hazardous to his or her health. How often a donor can give varies from days to months based on what he or she donates and the laws of the country where the donation takes place. For example in the United States, donors must wait eight weeks (56 days) between whole blood donations but only three days between platelet pheresis donations (2)

## Benefits of blood donations

**IMPROVES HEART HEALTH:** . Regularly donating blood helps males in particular to reduce the amount of iron in the blood. This can reduce the chance of heart attack by 88%. Additionally, regular blood donation can lower the risk of severe cardiovascular events such as stroke by 33%.

**ENHANCES THE PRODUCTION OF NEW BLOOD CELLS**

**BURNS CALORIES :** Donating blood on a regular basis can also improve fitness. Donating one pint of blood (450 ml) burns 650 calories in donor's body.

**ENHANCES FEELING OF WELL BEING IN ELDERLY PEOPLE :** Many elderly people who are in good health

have reported feeling invigorated and reenergized by giving blood on a regular basis.

**REDUCES CANCER RISK :** Give blood to help lower your risk of cancer. According to the Miller-Keystone Blood Center, consistent blood donation is associated with lowered risks of cancers, including liver, lung, colon, stomach and throat cancers. Risk levels drop in correlation with how often participants donate blood. (5)

## Forms of autologous blood transfusion

Three main techniques for autologous transfusion are predeposit autologous donation (PAD), acute normovolaemic

haemodilution (ANH), and perioperative cell salvage (PCS).

## Predeposit autologous donation (PAD)

PAD entails repeated preoperative phlebotomy, 4 - 5 weeks before surgery, during which time 4 or 5 units of in-date blood can be collected with ease.(6) This technique reduces exposure to allogeneic blood. It avoids many of the risks of transfusion, especially immunisation to red cell/platelets/ HLA antigens and the transmission of infection. Any patient who is medically fit for elective surgery is fit to donate blood

preoperatively. The reductions in haematocrit and blood viscosity that accompany preoperative donation improve microcirculation and tissue perfusion, and reduce the risk of thromboembolism.(7)

PAD programs are not without some drawbacks. Perhaps the most important is that autologous blood is considerably more expensive than allogeneic blood. This problem is compounded by the fact that current reimbursement programs (including Medicare) either deny the medical necessity of PAD or ignore the well-documented increase in cost (9)

The basis for the higher cost includes the extra time and attention required by autologous donor/patients; the enhanced clerical requirements; the special handling (additional labels, separate storage, early delivery to the hospital, etc); and the fact that blood that is not transfused to the intended recipient (approximately 50 percent of donated blood) is generally wasted rather than transfused to other patients(10)

In the late 1980s, when concern about infection risk was at its peak, virtually all patients contemplating surgery who had even a remote necessity for blood transfusion chose to participate in a PAD program. As a result of this overutilization, actual usage of predonated units by autologous donor/patients declined to between 40 and 58 percent<sup>(11-12)</sup>

This has led to the generation of guidelines to increase the efficiency of PAD. Good candidates for PAD include patients with the following characteristics:

- They are in relatively good health.
- They can tolerate iron replenishment.
- They are about to undergo a surgical procedure during which the likelihood of blood loss in excess of 500 to 1000 mL is equal to or greater than 5 to 10 percent.

Another approach for the last criterion is to encourage PAD for any patient scheduled for elective surgery for whom crossmatched blood is recommended by the local hospital maximum blood order schedule.

The number of units to be predonated depends upon the anticipated blood loss, an amount that varies, even for the same procedure, among surgical teams in different hospitals. It is therefore difficult to make general recommendations regarding the number of units to collect for specific procedures. A method has been proposed to estimate, in a given hospital, the approximate number of autologous units to draw for any procedure in order to prevent the need for allogeneic blood in any given percentage of patients<sup>(13)</sup>

This method is called SOPCAB, an acronym for "schedule of optimal preoperative collection of autologous blood."

SOPCAB, although not widely utilized, is a reasonable first step. One simply calculates, for a given procedure, how much blood would have had to have been predonated in order to satisfy the complete blood needs of 75 percent of patients. That number then becomes the standard order unless there are special circumstances that dictate any changes. The major drawback to this approach is that a great deal of extra blood is drawn and ultimately wasted in order to satisfy the transfusion needs of a large percentage of patients.

Virtually any patient deemed medically able to tolerate a surgical procedure involving general anesthesia should also be able to tolerate the withdrawal of one unit of blood (500 mL or proportionately less if the donor weighs under 50 kg [110 lb]). Factors strictly defined for allogeneic donors, including age, weight, sex, and hemoglobin level, are

evaluated with greater flexibility for the autologous donor<sup>(14-15)</sup>

Several studies have documented the ability of even higher risk donor/patients to tolerate the donation process<sup>(16-17)</sup>.

However, one report detected a substantial number of adverse hemodynamic changes (systolic and diastolic hypotension, orthostatic hypotension, tachycardia, arrhythmias and ST-T wave changes) not recognized by conventional clinical observation<sup>(18)</sup>

**Contraindications** — Exclusions from PAD include patients with any of the following conditions:

- Unstable angina or angina at rest
- A myocardial infarction within the last three months
- Heart failure
- Aortic stenosis
- Ventricular arrhythmias
- Transient ischemic attacks
- Marked hypertension

PAD is also contraindicated in patients with an active infection, particularly if it could be associated with bacteremia. Although most bacteria will not proliferate in the cold, some psychrophilic organisms (such as *Yersinia enterocolitica*) can reach peak concentrations in blood within one or two weeks of storage at 4°C.

Transfusion of this blood after prolonged cold storage has been associated with fatal reactions<sup>(19)</sup>

## INDICATIONS FOR TRANSFUSION

Transfusion of autologous blood is not free of potential toxicity including:

- Hemolysis secondary to improper handling of the saved units<sup>(20)</sup>
- Sepsis resulting from bacterial contamination of the saved units<sup>(21)</sup>
- Pulmonary edema induced by volume overload or transfusion of the wrong unit of blood due to misidentification<sup>(22)</sup>

### Acute normovolaemic haemodilution (ANH)

Acute normovolaemic haemodilution ('haemodilution') is a form of autologous donation performed preoperatively in the operating theatre or anaesthetic area.<sup>(1)</sup> **Perioperative cell salvage (PCS)** Intraoperative RBC salvage entails the collection and reinfusion of blood lost during or after surgery. Shed blood is aspirated from the operative field into a specially designed centrifuge. Citrate or heparin anticoagulant is added, and the contents are filtered to

remove clots and debris. Centrifuging concentrates the salvaged red cells, and saline washing may be used. This concentrate is then reinfused <sup>(4)</sup>

**Objectives:** to assess knowledge about blood donation and knowledge and attitude about autologous blood transfusion among medical students in different colleges in KSA.

**Material and Methods:** A cross-sectional study was conducted among 161 Medical Students, randomly selected from all years in different medical colleges in KSA. A web-based self-administered, structured English questionnaire was used to test knowledge and attitude of medical students about blood donation and its subtype (autologous blood donation). The collected data were entered and analyzed using Google document.

## Discussion

A cross-sectional study was conducted to assess the knowledge and attitudes of medical students in different medical colleges in KSA about blood donation and autologous blood transfusion. Our results show that the highest percentages of our students were from 3<sup>rd</sup> year and most of them were females.

Regarding the knowledge of the participated students about blood donation, higher percentage of students have adequate knowledge by giving right answers about the blood vessels used for blood donation and the harmful effect of blood donation, this is similar to the results of the study conducted to assess attitude, belief and knowledge about blood donation and transfusion in Saudi population (1) other similar study conducted to assess Knowledge and Attitude about Blood Donation Amongst Undergraduate Students of Pravara Institute of Medical Sciences Deemed University of Central India (5), but for our surprise higher percentage answered that there is possibility of transmission of infectious diseases through blood donation and the complications that can occur after blood donation. Also most of them give wrong answers about the duration of preservation of blood and the universal donor blood group. This may be explained as; most of those who give these answers were the students of pre-clinical years (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> years) who have little practical medical knowledge about this topic, also indicated deficient in awareness about the blood donation in the community as a whole. This is similarly to the results of the study conducted by Hossein et al, showed that (66.6%) believed that blood donation is a way for transmitting infections and may lead to complications. (6) This needs special attention because this knowledge may be reflected on the attitude and practice and lead to decrease in blood donation.

Regarding autologous blood donation, the higher percentage of the students don't have enough knowledge and awareness about it, its procedure, and benefits. This is also reflected on their attitude toward this type of donation, this can be explained by decrease awareness about this type of blood donation in our community although it's a well-established system in many hospitals in Saudi Arabia and the military hospital in Tabuk city.

## Result

Distribution of medical students according to study Years, the highest percentage was found in 3<sup>rd</sup> (20%), 6<sup>th</sup>

was found in 1<sup>st</sup>

students according to their gender, Fig (2) shows that the majority was females

(73%) than male (27%).

represents knowledge about blood donation among medical students

where 68% of students know the right answer that blood is collected from

vein, while 24% of them answer wrong one (from artery) and 8% don't know.

38% of students answer on question about how long blood can be preserved

correctly and 62% of students give wrong answer. 48% of the students know

that O-negative is universal donor blood group, while 52% of students answer

wrong answers O-positive, AB-positive. 90% of students agree that infectious

disease could be transferred due to blood donation, and 75% of them answer

that there are complications after blood donation and lastly 80% of students

agree that blood donation is not harmful procedure.

year (19%),

4th year (2%) . Regarding the Distribution of participated medical

(15%) , 2<sup>nd</sup> year students (34%) after that : 5th

year (10%) , the lowest percentage

Regarding the knowledge and attitude about autologous blood donation .

shows that 55% of students doesn't hear about autologous blood

donation, where 45% have an idea about it ,also 74% doesn't Know the

subtypes of it . Only 36% of students know the benefits of autologous blood

donation in contrast 63% don't know about its benefit . 58% of students

don't know if autologous blood transfusion is the safest way for donation

of blood ,where as 37% agree about its safety. 94% of students agree that

awareness about autologous blood donation in our society is enough . While

57% they don't have any idea about if doctors encourage patient about this

method or not . 47% agree that disease can be diminished if we use this method

and 47% of students they don't know . 53% of students refuse undergo an

autologous blood transfusion where as 47% agree to use it . 74% of students

will not encouraged others to use this method , and only 29% will encourage

other regarding this method of blood transfusion

### Recommendation:

1- Health campaigns to increase awareness of the community about blood donation and autologous blood transfusion

2- Increase awareness about blood donation and autologous blood donation among medical students

- 1- Increasing role of physician in Tabuk and KSA as whole city to increase awareness about autologous blood transfusion in our society

### Conclusions:

Diminish knowledge about blood donation as well as knowledge and attitude about autologous blood transfusion among medical students who are the base of community and the future physicians is considered a real problem which needs more attention.

### References :

- 1) Al-Drees,AM. attitude , belief and knowledge about blood donation and transfusion in Saudi population, *Park J Med Sci* January – March 2008 Vol.24No.1 74-79
- 2) "FAQs About Donating Blood". American Red Cross Biomedical Services. Retrieved 2009-10-26.
- 3) Autologous Transfusion. American Association of Blood Banks. AABB 1990; 10th Edition pg 433-448.
- 4) Yomtovian R. Practical aspects of preoperative autologous transfusion. *Amer. Med. J. Clin. Pathol.* (United States). 1997; 107(4 Suppl 1): 28-35.
- 5) Parker-Williams EJ. Autologous blood transfusion. *Postgraduate Doctor* 1989; 11: 52-56.
- 6) Blumberg N, Vanderlinde ES, Heal JM. Autologous transfusion. *BMJ* 2002;324: 772-775.
- 7) Parker-Williams EJ. Autologous blood transfusion. *Postgraduate Doctor* 1989; 11: 52-56.
- 8) Hossein S, Nasim P, Batool M. University students awareness and attitude towards blood donation in kerman city. *Iran J Blood Cancer* 2007;3:107-10
- 9) Goldman M, Savard R, Long A, et al. Declining value of preoperative autologous donation. *Transfusion* 2002; 42:819.
- 10) Fontaine MJ, Winters JL, Moore SB, et al. Frozen preoperative autologous blood donation for heart transplantation at the Mayo Clinic from 1988 to 1999. *Transfusion* 2003; 43:476.



- 11) Devine P, Postoway N, Hoffstadter L, et al. Blood donation and transfusion practices: the 1990 American Association of Blood Banks Institutional Membership Questionnaire. Transfusion 1992; 32:683.
- 12) Goldman M, Savard R, Long A, et al. Declining value of preoperative autologous donation. Transfusion 2002; 42:819.
- 13) Axelrod FB, Pepkowitz SH, Goldfinger D. Establishment of a schedule of optimal preoperative collection of autologous blood. Transfusion 1989; 29:677.
- 14) Mott LS, Bechinski J, Jones MJ. Autologous blood collection in anemic patients using low-dose erythropoietin therapy. J Natl Med Assoc 1997; 89:381.
- 15) Nuttall GA, Santrach PJ, Oliver WC Jr, et al. Possible guidelines for autologous red blood cell donations before total hip arthroplasty based on the surgical blood order equation. Mayo Clin Proc 2000; 75:10.
- 16) Mann M, Sacks HJ, Goldfinger D. Safety of autologous blood donation prior to elective surgery for a variety of potentially "high-risk" patients. Transfusion 1983; 23:229.
- 17) Owings DV, Kruskal MS, Thurer RL, Donovan LM. Autologous blood donations prior to elective cardiac surgery. Safety and effect on subsequent blood use. JAMA 1989; 262:1963.
- 18) Spiess BD, Sassetti R, McCarthy RJ, et al. Autologous blood donation: hemodynamics in a high-risk patient population. Transfusion 1992; 32:17.
- 19) Stenhouse MA, Milner LV. Yersinia enterocolitica. A hazard in blood transfusion. Transfusion 1982; 22:396.
- 20) Cregan P, Donegan E, Gotelli G. Hemolytic transfusion reaction following transfusion of frozen and washed autologous red cells. Transfusion 1991; 31:172.
- 21) Richards C, Kolins J, Trindade CD. Autologous transfusion-transmitted Yersinia enterocolitica. JAMA 1992; 268:154.
- 22) College of American Pathologists, Comprehensive Transfusion Medicine Survey. Set J-C, 1992.

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