

## Pre -Operative Autologous Blood Donation and Surgery

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### ABSTRACT

Safety in all sphere of life and in every field of working is prime concern for individuals. Thus, safety in surgery and safety in blood transfusion during pre-operative, intra-operative and in post-operative period is mandatory. We can pre-deposit our own blood before planed surgery is scheduled, called as pre-operative autologous blood donation (PABD), but it may not be possible for emergency surgery so we may have to go for allogenic blood transfusion in case of blood needed for life saving purpose. People are now much aware on transfusion reactions; some time fatal consequences have been noticed in blood transfusion. Transfusions of allogenic blood carries more risk than the autologous blood. Many of clinicians recommend autologous blood, so PABD will be wise step before individual person plans for planned surgery. A fear of transmission of transmissible infection such as HIV/AIDS, Hepatitis B, Hepatitis C, Malaria, syphilis, tuberculosis and many others, are possible in allogenic blood transfusion, which is not with PABD.

**KEYWORDS:** pre-operative autologous blood donation (PABD)

### ARTICLE DETAILS

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### INTRODUCTION

Blood is life. With no sufficient blood, body's organs will not get the oxygen and nutrients they need to survive. We couldn't keep ourself warm or cool off, unable to fight properly the infections or get rid off properly our own waste products, if blood is inadequate. Blood brings oxygen, nutrients and carries hormones to all parts body, so they can keep working. Blood carries carbon dioxide and other waste materials to the lungs, kidneys, and digestive system to be removed from body.

Blood is made up of blood cells and plasma. Plasma is a yellowish fluid that has nutrients, proteins, hormones, and waste products. The different types of blood cells have different jobs to do in body. Red blood cells are slightly indented, flattened disc, contain hemoglobin, a protein which carries oxygen from lungs and colors bright red. Red blood cells (RBC) passes through the body parts and goes on releasing oxygen to the organs and gradually fades its bright red color and comes back through circulation to lungs to get re-oxygenated and this goes for about 4 months, when the particular RBC mass dies, to be replaced by new red cells. Each day some of red cells die and get replaced by newly formed RBC and this circulation goes on till the person survives. New red cells are produced from bone marrow. White blood cells (WBC) are the key part of immune system

and defend body against different types of infection and make antibodies needed to keep the body protected. There are many types of WBCs, and their life spans vary from hours to days. New cells are constantly being formed, some in the bone marrow and some in other parts of the body such as the spleen, thymus, and lymph nodes. Other tiny oval-shaped cells that help in the clotting process are called platelets. The circulatory system is made up of blood vessels that carry blood away from and toward the heart. There is no substitute for blood. It cannot be made or manufactured. Generous blood donors are the only source of blood for patients in need of a blood transfusion, called as allogenic blood transfusion, where there are possibilities of transfusion of transmissible infections. So PABD is one of easy and possible alternative to allogenic blood for self-planed surgery.

### MATERIAL AND METHODS

PABD is easiest way to manage blood for planned blood needing surgery on our own body. We have to estimate first hemoglobin (Hb) level of person selected for PABD. If it is more than 10 Grams (Gms), we can ask the person for PABD. In case Hb is less than 10 Gms, we may have to postpone planned surgery till it is increased to more than 10 Gms. We have to get acid citrate bottles, bottles containing anti-coagulant. Standard bottles with acid citrate as anticoagulant,

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can be obtained from any blood bank and withdraw blood of particular individual person, who is planned for blood needing planned surgery. Blood withdrawal is done the way it is done in mass blood donation camp. We can withdraw ourself blood or blood bank person can be requested to help in the proceeding. If we feel that one unit of blood is sufficient for particular surgery, who did PABD, we can go for surgery on Same day with extra one unit of fluid replacement with ringers' lactate or normal saline than the usual need for that surgery and that duration of surgery. If we anticipate that particular person in particular surgery will need more than one unit of blood then we can take blood next day and preserve the blood at particular temperature, possibly in blood bank. This kind of self-donation is possible for various types of planned cardiac, orthopedic, hepatobiliary, gastro-intestinal, urogenital and neurosurgery. Person also knowing the fact that the same blood will be transfused to him during or after his surgery, he will willfully accept the proposal of PABD and follow the guideline. Two units as such can be taken from a healthy person and can transfuse ringers' lactate or normal saline in same volume. This fluid replacement will cover the intravascular volume, though some dilution of blood. This withdrawal and fluid replacement causing hemodilution and decreased red cell volume will infect physiologically stimulated bone marrow to produce more RBC to compensate and to come in prior position in RBC count<sup>1</sup>. The formation of a red blood cell takes about 2 days. The body makes about two million red blood cells every second. Blood consists of 45% red blood cells, less than 1% white blood cells and platelets, and 55% plasma<sup>2</sup>.

### RESULT

Out of total 45 years of my working as surgeon after my post-graduation, we did 153 PABD in the following surgery in the last 35 years.

Type of cases	Prostatic enucleation	Renal Surgery	Gall bladder surgery	splenectomy	Thyroid surgery
PABD	85	37	16	8	7

Total PABD 153 cases

#### Prostate:

We had been doing trans vesical prostatic enucleation with one unit of PABD a day before the planned prostatectomy. This surgery being more over a kind of blind approach, postoperative bleeding was anticipated. Usually, one unit of blood had been sufficient. Out of many prostatectomies, we did PABD in 85 cases and had zero postoperative problems. Now a days transurethral resection of prostate (TURP) has become more popular than the prostate enucleation but with TURP recurrence of prostatic problems with further prostate

enlargement is more common and re-TURP is usually becoming necessary. No recurrence, if prostate is enucleated and removed, though prostate enucleation is more difficult and carries more morbidity than TURP but there is no further problems in future to particular individual after prostate enucleation.

#### Renal surgery

Usually, blood in renal surgery is not required, but most of the time anesthetist feel unsafe if blood is not ready before surgery. Sometime in nephrectomy for huge nonfunctional hydronephrotic / pyonephrotic kidney of long duration with bad perinephric adhesion, more than average bleeding may be anticipated so blood may be required. Such cases may be asked for PABD. We did one unit of PABD in 37 cases and we transfused one unit blood in 24 cases. Blood which was not used was given to blood bank. We noticed no postoperative problems with such blood transfusion.

#### Gall bladder surgery

Usually no blood is required for cholecystectomy, but some time in acute stage with big gall bladder lump of long duration, some bleeding may be anticipated and in such cases person may be asked for PABD. We did 16 PABD and transfused with no postoperative problems.

#### Spleen surgery

For hypersplenism needing surgery, we did 2 units each PABD in 4 cases. One unit per day with volume replacement and person were subjected to surgery on third day. We transfused 2 units each blood to them with no intraoperative or postoperative problems.

#### Thyroid Surgery

Huge long-standing Goiters, when surgery is planned in them, then precautionary blood arrangement is better. We did PABD, one unit each in 7 cases and 5 cases were transfused blood with no observed pathophysiological postoperative problems.

### DISCUSSION

Safety is prime concern in any major or the minor surgical activity. So self-preoperative blood donation then getting surgery done may be one choice in safety of blood transfusion. Pre-operative autologous blood donation (PABD) aims to provide a supply of safe blood for patients undergoing surgery who might need a blood transfusion while at the same time increasing the patient's total red blood cell (RBC) mass due to the PABD-induced stimulation of erythropoiesis before scheduled elective surgery.<sup>1</sup> J Itchason et al studied the cost effectiveness of PABD and shown that increasing numbers of people are doing PABD before their scheduled surgery with knowledge that HIV can spread by blood transfusion but it is expensive process than donation of allogenic blood by community volunteers.<sup>3</sup> Wulf Dietrich et al studied on 4325 cases of cardiac surgery and out of them 849 cases (20%) cases did PABD for their cardiac surgery

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and 3476 (80% ) did not. They found that person who did 2 units of PABD significantly reduced the use of requirement of allogenic blood. So PABD had been definitely cost effective at the same time an alternative to allogenic blood.<sup>4</sup> W Dietrich, has studied various aspects of Autologous blood donation in cardiac surgery on 4878 cases. 18% did PABD and it was found that with the help of PABD, requirement for allogenic blood reduced to 13% from 48%. At the same time, it was seen cost effective.<sup>5</sup> C politis et al enrolled 462 cases in obstetrics and gynecology for PABD and out of them 284 cases did PABD and found in their conclusion that autologous blood transfusion reduces the risk of allogenic blood transfusion.<sup>6,7</sup>

## CONCLUSION

Pre-operative autologous blood donation is most safe, convenient and economic. This proceeding can be done for any planned surgery at any place and any corner of world by any clinician and any surgical faculty member. So, in the unsafe world of blood transfusion, where transfusion of transmissible infection is possible with allogenic blood, PABD will be the surest answer. I recommend every general surgeon, gynecologist, orthopedic and cardiac surgeon to follow this proceeding for the safety of your patient. I am sure this proceeding needs little more efforts and self interest but is safest procedure in blood transfusion services.

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