

Review Article

ANAESTHETIST IN SBTP (SAFE BLOOD TRANSFUSION PROGRAMME)

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INTRODUCTION:

'Safe blood transfusion' is a worldwide slogan. Anaesthetist may play a very important role in implementing the programme. Blood transfusion has undoubted benefits but carries serious risks of transfusion transmitted diseases. So collection of safe, able and low risk donor and rational use of blood are the fundamental responsibilities of the concerned authorities. In Bangladesh about 2.5 Lac units of blood is required yearly. Efficacy of transmission of HIV through contaminated blood is almost 100%. Paid blood donors share the major portion (70%) of collected blood in the country suffering from hepatitis-B (29%), hepatitis-C (6%), syphilis (22%) significantly. Most of the blood used in the hospitals and clinics actually under the shadow prescription of anaesthetist. The blood demand for perioperative surgical patients and ICU encompasses about 60% of the total blood consumption in hospitals and clinics from both Govt and non Govt sectors which means actually total national consumption. No blood is screened as mandatory in either system: Govt and other non-govt hospitals before the Safe Blood Transfusion Programme (BGD/97/005) under H.P.S.P (1998-2003). As a consequence of which major portion of blood are transfused unscreened risking the recipients to many diseases like AIDS, viral hepatitis, syphilis, malaria and others under the SBTP total of 97 screening centres (Medical college & hospitals, district hospitals, armed forces hospitals and some specialised hospitals) in whole Bangladesh are ear marked with facilities for screening at least five transfusion transmitted vulnerable diseases like HIV, HBV, HCV, syphilis and malaria. So blood which has not been obtained from appropriately selected donors and/or which has not been appropriately screened for infectious agents should not be transfused at all. As the anaesthetist is the peri operative prescriber of most blood transfusion and in the ICU as a critical care physician has very important role in the safe and rational use of blood.

Anaesthetist to decide whether blood is at all required:

While reviewing the requirements who has lost blood or in future be subjected to a procedure which involves such a loss the question that to be answered is whether any blood transfusion is necessary. Blood transfusion should not be the first consideration during management of patients with acute-haemorrhage; because blood volume replacement is initially more urgent requirement than red cell replacement. Adequate oxygenation and volume replacement with plasma substitute (crystalloid and colloids) and prompt and meticulous surgical care, may obviate the need for blood transfusion. The supply of oxygen in healthy, resting adult with a normal Hb concentration is 3-4 times greater than that required by tissue for metabolism. A safety margin is therefore exists between oxygen supply and demand and this allows some reduction in Hb to occur without serious consequences(1). The compensatory mechanisms are facilitated and tissue oxygenation is better preserved if normal blood volume is maintained with fluid replacement. This can be understood with oxygen flux equation^{1,2}.

Oxygen supply = Hb x 1.36 x saturation x COP
(ml/min) (gm/ml) (ml/gm) (%) (ml/min)
(O₂ carried by plasma is neglected)

The amount of blood loss and the patients clinical condition assessed by measuring BP, pulse rate, CVP and urine flow. Generally a healthy man can tolerate and acute loss of upto 20% of circulating blood volume without any problem. Blood loss between 20-30% can be replaced by crystalloid/colloid. Blood loss more than 30% or when hct < 30% blood should be transfused².

Anaesthetist is the motivator /councillor for recruiting low risk donor.

Surgeons of all disciplines (Gen. surgery, Ob-gyn, Orthopaedic, Cardiothoracic, Neuro, Uro, ENT etc)

refer their patients to anaesthetist for anaesthetic check-up and anaesthetic fitness and advice for investigation required and blood transfusion as needed. Many attendants and relatives accompany the patients and show sympathy and extends their helps regarding blood donation and others. Hence the anaesthetist ask for voluntary donation and screening for high risk TTDs. He can take the history, can do physical examination and ask for investigation and thus boosts the non-reneumerated safe healthy donor pool. As Resolution 28.72 of World Health Assembly established the principle that blood donation should be voluntary and non-reneumerated (unpaid)². {Voluntary non-reneumerated donor : A donor who gives blood freely and voluntarily without receiving money or any other form of payment²}. Aneasthetist can send family or replacement donor blood (which may involve a hidden paid donation system and thus carries risks) for re-screening and reject commercial or paid donor blood if it is proved to be unsafe (Commercial or professional donor: A donor who gives blood for money or other form of payment).

Anaesthetist can conserve blood and thus minimise homologous blood use:

He is as a chief of the team will reject the unscreened blood for transfusion and will advise cold-chain transfer of blood so that unused blood is not wasted as blood is scarce human resource. He as a member of HTC (Hospital Transfusion Committee) and actual user of the blood in the theatre and ICU and can adopt the policy of MSBOS (Maximum Surgical Blood Order Schedule). HTC should review blood usage and make tariff for each operation. If less than two units of blood requires then no blood should be cross-matched but grouped only. Single unit transfusion should be avoided except in paediatric and the patient is previously anaemic. Other than in the most exceptional life threatening situation blood should not be transfused unless it has been obtained from appropriately selected donors and has been screened for transfusion- transmissible infections in accordance with national requirements.

The anaesthetist can take measure to reduce blood loss. One of the most important techniques is hypotensive anaesthesia. Cerebral autoregulation can be well maintained within MAP (Mean Arterial

Pressure) of 62-65 mm of Hg and with this 50% of surgical blood loss can be minimised. However this technique can not be recommended for inexperienced anaesthetist or where comprehensive monitoring facilities are unavailable(2). The following techniques and measures may be adopted to reduce operative blood loss:

- (a) Meticulous surgical techniques,
- (b) Use of posture,
- (c) Use of vasoconstrictor,
- (d) Use of tourniquets,
- (e) Anaesthetic techniques,
- (f) Use of anti-fibrinolytic drugs eg, DDAVP, Tranexemic acid, Aminocaproic acid and aprotinin etc³.

Anaesthetist can use alternative to homologous blood:

With the help of department of transfusion medicine, anaesthetist can arrange autologous blood transfusion in the form of predeposit donation, acute normovolemic hemodilution, intra operative cell salvage and postoperative collection and transfusion. It is very much possible in our situation where major surgical procedure, for example, cardiothoracic or cardiovascular surgery is scheduled pre donation of 4-6 pints of autologous blood may be collected during the period of 4-6 weeks from the otherwise healthy patients and stored in CPD-A and used during surgery. By this time the patient regains his volume and haematinics may be prescribed for enhanced erythropoiesis which has already been started. Alternatively on the OT table upto one litre of blood is drawn from the patient in an anticoagulant containing bag (ANH) and replacing volume with crystalloid/colloid and after homeostasis the blood is transfused again. Intraoperative cell salvation and post operative collection are cumbersome and may be done with special devices .Use of haematinics and erythropoietin in chronic cases, crystalloid/colloids to replace volume and for increasing oxygen carrying capacity PFC (perflurochemical emulsion) and stroma free Hb (SFHb) solutions are other alternative.

Safety of the team itself:

Anaesthetist, best user of blood with his team can reduce the risk of transfusion to himself, to his team (OT, ICU staffs) and to the patients by obeying

universal precaution and by encouraging others to abide by. These are very simple and nothing new. The health care workers should feel encouraged to adhere to these practices who will protect himself and his patients from deadly infections like HIV, HBV and HCV. These are handwashing, use of gloves, safe decontamination of instruments and other equipments, safe disposal of needles, sharps and wastes.

DISCUSSION:

It is clear that blood and its products are the most important routes of transmitting diseases like AIDS and viral hepatitis of which there is no remedy, except prevention by proper screening of donors. Avoidance of homologous blood transfusion, discouraging paid donors and by motivation and counselling increasing the healthy voluntary donor pool will reduce the prevalence of the disease. Registered voluntary donor may participate in blood donations every 120 days, because red cell survival in 120 days, then they become worn out and decay and new cells are formed to replace the older one. Use of autologous blood will not only solve the problem of TTDs but also minimise the transfusion reactions, alloimmunisation to RBCs, transfusion transmitted graft versus host diseases, will stimulate erythropoiesis in predeposit and decrease viscosity and increases blood flow and oxygenation. Autologous transfusion will reduce homologous transfusion and it has got psychological benefit also. Later on they may become homologous donor and may boost up voluntary donor pool. In some religious group like Jehovah's witness it is beneficial. Safe blood transfusion law has been passed by the parliament and was approved by the president of Bangladesh in 10th April 2002(4). There are only 97 centres for screening TTDs. But these

are not sufficient for total screening in whole Bangladesh. So before execution of the law adequate services to be provided. Above elaboration showed that anaesthetist plays a key role in many stations from the beginning of selecting donors and upto postoperative transfusion if needed. So he has got the immense responsibility in safe blood transfusion programme.

CONCLUSION:

This is a message to the concern authorities of SBTP and surgeons and anaesthetists in particular that anaesthetist's role in limiting professional donors, boosting up of safe voluntary donors, encouraging autologous transfusion and using substitutes and alternative techniques of blood transfusion can have a great contribution to the nation-wide mandatory safe blood transfusion programme.

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