Review

Current challenges and future achievements of blood transfusion service in Afghanistan

A.M. Cheraghali a,b,* E. Sanei Moghaddam a, A. Masoud c, H. Faisal c

a High Institute for Research and Education on Transfusion Medicine, Iran Blood Transfusion Organization, Tehran, Iran
b Department of Pharmacology, University of Baqiyatallah Medical Science, Tehran, Iran
c Kabul Blood Bank, Kabul, Afghanistan

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A B S T R A C T

Afghanistan is a country with population of over 28 million. The long term conflicts have devastated country’s qualified resources including human resources. ANBSTS was established by MoPH as the country national blood service. Currently in addition to central and regional blood centers of ANBSTS many other hospitals have their own transfusion services. Blood donation in Afghanistan mainly depends on replacement donors. Donor selection and donor interview are not very efficient. Most of the blood in Afghanistan is administered as fresh whole blood. Although blood transfusion services in Afghanistan require more efforts to be fully efficient, based on recent improvements in working procedures of ANBSTS a promising future for blood transfusion services in Afghanistan is predicted.

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* Corresponding author at: Iran Blood Transfusion Organization Research Center, Hemmat Highway, Tehran 1449613111, Iran. Fax: +98 21 88601580.
E-mail address: Cheraghali@ibto.ir (A.M. Cheraghali).

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1. Introduction

Current population of Afghanistan is estimated to be over 28 millions. Although the country spends more than 7.4% of its GDP on health, total expenditure on health is about 69 USD per capita. Afghanistan has a very young population and 46% of its population is less than 15 years old and total fertility rate of its women is about 6.3 per woman [1]. Decades of war have devastated the country’s infrastructures including health sector. In addition to the devastating economic effects, these long term conflicts have depleted qualified resources including human resources of the country. In Afghanistan Ministry of Public Health (MoPH) is responsible for providing health services including blood transfusion services to all Afghans. Blood transfusion services ranges widely in respect to safety and quality among the countries of the WHO Eastern Mediterranean Region. Although some countries of the Region have managed to establish a safe and efficient blood transfusion services there are still concerns regarding blood transfusion services in other countries of the region [2–4]. Current situation of blood transfusion services in Afghanistan is mainly characterized with very low regulated and fragmented services across the country.

Blood transfusion is an essential component of health care services which saves millions of lives of patients who needs blood for surgery, trauma, severe anaemia or complications of pregnancy [5–7]. Severe bleeding during delivery or after childbirth is the most common cause of maternal mortality in many developing countries including Afghanistan. The provision of sufficient and safe blood and blood components is an essential component of quality health services and is therefore should be an integral part of national healthcare system. Blood is one of the most precious gifts which its availability to the patients is greatly depends on the generosity and altruism of the people who donates this gift of life.

The Afghanistan National Blood Safety and Transfusion Service (ANBSTS) as part of the national health care system was created by MoPH to establish and maintain the safety and adequacy of the national blood supply. MoPH has established the ANBSTS with five regional blood banks in Kabul, Mazar-e-Sharif, Herat, Jalalabad and Kandahar [8]. However despite recent progresses in some parts of the country, notably in Kabul Blood Bank (KBB), blood transfusion services in Afghanistan require more efforts to be fully efficient in terms of quality of services. Lack of qualified organization, fragmentation, low efficiency of blood services’ operations and insufficient commitment and support are among the main challenges of blood transfusion services in Afghanistan.

Currently in addition to central and regional blood centres of ANBSTS many other public and private and NGO run hospitals have their own transfusion services. In fact it appears that every hospital in Afghanistan has its own independent blood transfusion services. Quality and safety of services in these hospitals mostly depend on policy of the hospital and not to the national regulation or guidelines. Therefore there are vast variations between type and quality of blood transfusion services provided to the patients. Although some hospital including military service hospitals and some NGO run hospitals offer reasonably acceptable blood transfusion services, blood transfusion services in most of the hospitals in Afghanistan do not comply with recognized standards of blood transfusion services. In these hospitals family donors mostly refer to the hospital laboratory department and will be bled for their patients. There is no effective donor selection strategy and in best cases donated blood would only be tested using rapid test kits. There is currently no formal national legislation to guide, manage and supervise operations of these blood banks.

Blood shortage is a main concern for health sector of this country. An inadequate stock of blood usually forces transfusion service officials to turn to replacement or possibly “hidden” paid donors which might ultimately increase safety risks attributed to these types of donations.

2. Current status of blood transfusion in Afghanistan

2.1. National priority for blood transfusion services

Despite importance of blood transfusion services on promoting national health services, there is not any published document indicating any priority given from national health system to blood transfusion services in Afghanistan. There is not any approved law or national policy supporting blood transfusion services in Afghanistan.

ANBSTS and KBB are located in a five stories building belong to Russia era in Afghanistan. Although the building is very spacious and kept fairy well, its utilities including electricity, water and sewage systems require refurbishments. Power cut is a problem and could damage routine activities of ANBSTS. Lack of proper communication facilities including telephone and LAN system is the main disadvantages of the current building.

There is only one operative mobile unit (bus) in KBB. This mobile unit collects about 50 bags of blood every day. The total blood donation in KBB is in range of 120–150 bags per day.

2.2. Funding

ANBSTS provides all services related to blood transfusion services to the public hospitals free of charge. Although ANBSTS receives funds through MoPH, costs attributed to its daily operation and development activities are fully dependent on international donor. Based on an agreement signed in 2004 between government of Afghanistan and Agence Francaise De Development (AFD) the French agency accepts the responsibility of funding ANBSTS. The purpose of the grant is to rehabilitate the Afghanistan blood transfusion service. Some of the important services provided through AFD fund will cover ANBSTS requirements for equipment and consumables, construction of new buildings in Kabul and regional branches, staff training and collaboration with ANBSTS for the implementation of a quality control mechanism for blood testing and the implementation of an information system.
It is clear that funds received through international donors will not exist in near future. Therefore it is crucial that ANBSTS establishes a sustainable source of funding for its operations. According to Afghanistan constitution law basic health services should be free for all Afghan. Therefore ANBSTS obliged to provide “basic” transfusion services free of charge. However, basic services in blood transfusion services are not clearly defined.

2.3. Blood donation and blood safety data

Blood donation in Afghanistan mainly depends on replacement donors. Unfortunately due to lack of reliable data it is very difficult to draw concrete conclusions about current situation of blood donation in Afghanistan. Based on the only data available in KBB which consist of its own statistics and some regional centers which periodically report to KBB, number of registered donation in Afghanistan is in range of 35,000 donations per year. Obviously this data does not include blood donated in hospitals and other medical centers all over the country. Based on WHO recommendation of donation by at least 1% of population to accommodate minimum needs of any nation to blood and its components [7], Afghanistan with an estimated population of 28 millions, needs at least about 300,000 units of blood annually.

Although ANBSTS is mainly dependent on replacement and family donors few data collected by KBB regarding blood donations indicate a positive trend toward increasing share of non remunerated volunteer donors in blood pool of Kabul. In KBB share of volunteer donation in total donation is about 45% (Fig. 1). The value is not known for whole country and it is estimated that percent of volunteer donation in other centers would be much lower or even non existence. All 100, 250 and 450 ml bags are used in KBB for donation. 100 ml bags are mostly being used for thalassemic children. Data related to blood bags collected by ANBSTS in 2010 are shown in Fig. 1.

Donor selection and donor interview are not very effective in ANBSTS and there is no data regarding per cent of deferred donors or the reasons. Pre-donation counseling is not always consistently conducted. A questionnaire for donor interview has been developed but not consistently filled or recorded. There is not a consistent method or database currently in place for managing donor information. Therefore, donor information and statistics are not readily available.

As a general rule donors (both volunteer and replacement) are considered safe and suitable for donation unless otherwise proved. Therefore rate of donor deferral at ANBSTS is very low, but not exactly known. Despite efficiency of KBB mobile unit in collecting good number of donated blood solely from volunteer donors, due to lack of a strict guideline and a system for data recording, donor selection and interview are not followed seriously enough in mobile unit.

Donated bloods in ANBSTS are screened for important Transfusion Transmitted Infections (TTI) such as HIV, HBV, HCV and Syphilis using rapid test kits. ANBSTS uses a pre donation test strategy for excluding positive donors from blood donation. In this method they first draw a blood sample from potential donor and then perform rapid tests on the sample. This sample also is being used for blood group typing and Hb measurement. ABORh typing is conducted. However, antibody screening is not conducted routinely.

If tests results come negative the potential donor will be bled. ANBSTS mostly uses single bag blood collection bags. Therefore no further blood components preparation is performed in ANBSTS. Based on data collected in 2010 by KBB prevalence of some important TTI in screened donated bloods using rapid test kits are presented in Table 1.
2.4. Blood distribution and usage

KBB has a small room designated for storage of blood and blood components. These are mainly bloods donated by volunteer donors either in KBB or its mobile unit. The room contained several refrigerators and freezers without strict control of their temperatures. In general, a simple cross match is conducted before distribution of blood. Labeling of samples is not consistent and sample integrity is sometimes a concern.

Most of the bloods donated to KBB come from replacement donors. Therefore they immediately send to the hospital through the patient’s family member. KBB has no system for transportation of blood and this is responsibility of the patient’s family. There is not any appropriate transfer box available. Patient’s family usually carries the blood bag in their pocket or under their arm (in order to keep the blood bag warm). Obviously there is a potential risk of selling blood bags in the black market. Possibility of bacterial contamination during blood transportation should also be added to the above mentioned risks.

3. Discussion and conclusions

Although in developed countries, transfusion of blood and blood components is mostly used to support advanced medical and surgical procedures, in resource limited countries such as Afghanistan majority of blood are used for management of obstetric emergencies and patients suffering from trauma and severe anemia. Despite proven efficiency of blood transfusion as a life saving medical intervention Afghanistan health service do not always provide this service in a timely manner with optimum quality and safety standards. Blood transfusion service in Afghanistan is mainly fragmented and not adequately regulated. Despite presence of acceptable hardware and quantity of staff available in Afghanistan national blood transfusion services, due to lack of appropriate quality assurance system, software and automation blood transfusion practices in Afghanistan in its current situation do not always comply with internationally acceptable norms and standards.

Blood in Afghanistan is mostly donated by replacement donors. Obviously when family or replacement donors are not available patient’s family has to turn to paid donors to donate on their behalf. ANBSTS currently applies a pre donation testing for selection of the donors. According to WHO guideline pre donation testing of the donor does not ascertain the infectious status of the donation. Pre-donation testing may lead to wastage of resources and increased screening costs unless prevalence of TTI is extremely high. It increases the time taken for a donor to donate blood, causing undue inconvenience to donors, and also the risk of discrimination and stigmatization [8].

The use of rapid/simple assays is generally not recommended for blood screening and according to WHO guideline for blood safety “rapid tests are generally not suitable for screening large numbers of blood samples” [8].

There are also major problems in administration of blood in Afghanistan health facilities. Most of the blood in Afghanistan is administered as whole blood and concept of blood component therapy is almost none exist. Most of the Afghan physicians usually order “fresh and warm” whole blood. In order to accommodate the physician’s instruction blood banks in hospitals bleed the patients’ family member and directly send the fresh whole blood to the ward for transfusion to the patients. In these cases replacement donors only checked for the main blood group compatibility and no proper interview or medical examination will be performed on the donors. However, donated blood will be screened using rapid test kits.

Administration of low volume of the blood to the patients is another shortcoming in transfusion practices in Afghanistan. There are many occasions that physician transfuses only 200 ml or less of whole blood to the patients. Due to inherent risks attributed to blood transfusion, WHO recommends that blood transfusion should be reserved as a life saving practice only when alternative practices are not available or feasible [5]. Therefore in this type of practice patients might receive very little benefit at substantial cost of risks from receiving blood of questionable safety.

3.1. National transfusion law and policies

Currently there is no approved blood law or blood transfusion policy in Afghanistan. Although ANBSTS has already developed a quality guideline adopted from WHO guidelines on blood transfusion safety, it seems no part of this guideline is fully implemented. Despite presence of published “Basic Package of Health Services for Afghanistan, 2005” and draft of “Strategic Plan for the Ministry of Public Health 2011–2015” there is no statement regarding prioritizing blood transfusion safety and services in these official MoPH documents. This obviously will put blood transfusion as a very important and life saving intervention off the list of MoPH priorities. Therefore it is very important that MoPH announces Afghanistan national blood transfusion services as one of its important priorities. It will obviously indicate commitments from MoPH toward ANBSTS and its objectives.

3.2. Establishing a central blood transfusion service

WHO main recommendation for establishment of central national blood transfusion services [5,6] has been implemented in several countries worldwide and proved to be a very efficient intervention for providing sufficient safe blood and blood components to the national health services. Therefore it is recommended that Afghanistan health sector should also adopt this recommendation and move toward the establishment of a nationally coordinated blood transfusion services.

<table>
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<td>Prevalence of important TTI in blood donated in Kabul blood bank in 2010.</td>
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<td>HIV</td>
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ANBSTS should also perform a need assessment for the country and estimate need of the Afghanistan to the blood and blood components for future planning. Although WHO recommendation for nationwide needs to the blood is based on donation of minimum 1% of population [7], this very much depends on country situation. In countries such as Afghanistan with high rate of trauma and accidents and high birth rate the need to blood and its components expected to be much higher. Based on this assessment ANBSTS should create a nationwide network of blood establishments. These centers should bear the responsibility of providing sufficient safe blood and blood components for the nation.

3.3. Donor recruitment strategy

It is estimated that more than 95% of blood donation in Afghanistan comes from family replacement and less than 5% from voluntary donors. As it happens in many other countries which depend on “family donations”, these donors are sometimes paid by the patient’s family. Despite general consensus on importance of recruiting voluntary non remunerated donors for collecting blood, due to practical reasons this might not be an attainable goal at least in short term in Afghanistan. Therefore it seems that national policy makers in this country, while establishing a long term plan for reaching to the point of 100% voluntary blood donation, should implement a plan to wisely use replacement donors for providing safe blood to the patients in need of blood and blood components. However, it should be emphasized that using validated methods for donor recruitment/screening and blood testing should always be golden rules and standards for any type of donor recruitment.

Until repeat donors constitute a sizeable proportion of the blood donor pool no amount of screening alone, will improve blood safety. Therefore ANBSTS should develop a long term plan for increasing share of volunteer donors in national pool of blood donations. Among other strategies increasing number of mobile and fixed blood donation units all over the country especially in populous areas such as universities and mosques should be considered as one of the effective strategies for Kabul and other large cities. ANBSTS has a good experience of taking advantage of some religious opportunities such as Ashura to encourage Afghan people for volunteer donation [9,10]. It seems that these occasions at least in short term could play a substantial role in improving blood donation profile in Afghanistan. ANBSTS should also more effectively communicate with state and private public media including TV stations and printed media.

3.4. Blood safety measures

Transmission of viral infections and infections such as syphilis and malaria are among the most important risks of receiving tainted bloods. Therefore screening of the donated bloods play a major role in preventing transmission of TTI. WHO is not recommending use of rapid test kits in blood establishments with substantial number of donations [9]. Therefore ANBSTS should plan to replace its current system of relying on rapid tests for screening of donated blood with more reliable screening methods such as immunoassay methods.

Quality assurance (QA) is the most essential department of any national blood transfusion services. Therefore, QA department of ANBSTS should become more active as the most important department of ANBSTS. This department should oversee all activities related to the quality and safety of both blood donors and recipients.

ANBSTS does not have efficient documentation and technical record keeping. There are only very few standard operating procedures (SOPs) in place and all work procedures are mainly verbal.

Data collection and data sharing is one of the main essences of blood transfusion services. This would only properly happen through application of proper software and networking. There is no such system implemented in ANBSTS. No computer based working procedures is available or being used. Paper based documentation and recording are not always consistent. Therefore implementation of such systems is an immediate requirement for ANBSTS.

Current situation of blood distribution mechanism in ANBSTS is not acceptable by recognized standards in blood transfusion services. Family member of patient receive donated blood at KBB and carry it to the hospitals. This could potentially expose blood recipients to extra contamination which might happen during transport by this method. In addition this method could also promote “leakage” of blood into the black market. ANBSTS by establishing a reasonable stock of blood and its components in blood banks of hospitals could efficiently remove this risk and implement acceptable standards for blood distribution in hospitals.

3.5. Training and education

There is lack of update knowledge of current transfusion practices in ANBSTS. Above that it seems ANBSTS needs to find ways to improve motivation, self confidence and dedication of its staff toward their duties and responsibilities. Despite the fact that most of the KBB staff have received sufficient theoretical training in transfusion practices through workshops, it seems they are not motivated enough to use their knowledge in their daily practice.

Most of the current staff of ANBSTS does not have an academic training in transfusion medicine and this make it difficult for any major advancement in transfusion medicine in Afghanistan. Therefore providing academic training for young talented Afghan students will guarantee future of transfusion services in this country.

3.6. Appropriate use of blood

WHO recommends that administration of blood and blood components should be reserved for the situation that no other effective medical interventions are available. However, observations indicate serious problems regarding practice of blood transfusions in Afghanistan. Prescription of “fresh and warm” blood for patients might be considered as a main hurdle for improving blood screening systems in ANBSTS.
Therefore a national plan for improving knowledge of Afghan practitioners toward appropriate use of blood and blood components should be developed. MoPH should include training activities on appropriate use of blood in national continues medical education training program of practitioners in Afghanistan. Obviously without improving Afghan practitioners’ behavior toward blood transfusion efforts of MoPH and ANBSTS regarding improving national blood services will not be fruitful.

**Conflict of interest**

AMC and ESM have visited Afghanistan in 2011 as WHO consultants for evaluation of the country blood transfusion services.

**Acknowledgement**

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**References**