

Full Length Research Paper

Technician capability for blood screening in hospitals of Islamabad

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The study was conducted with the objective to access the technician capability for blood screening in hospitals of Islamabad. The parameters pertaining to technicians' capability under investigation were; qualification, skills, experience, on job training, knowledge and capability to use microscope, centrifuge and computers. The results of the study revealed that the technician capability for blood screening in hospitals of Islamabad was far below the World Health Organization (WHO) standards and also not compatible to National Health Policy guidelines. In order to adopt modern blood screening practices, the technician capability may be increased by imparting regular, periodical in-service training to the technician, so that safe blood is available for transfusion and as such, "more blood more life" slogan attain a reality in real perspective.

Key words: Technician capability, blood screening, hospitals, Islamabad.

INTRODUCTION

World blood day, 2011 was celebrated in Pakistan as in other parts of the world (Jang, 2011). The slogan of 2011 blood day was "more blood more life". This is absolutely valid in Pakistan perspective, where blood transfusion is an absolute necessity in cases of various hematological disorders, cancer, hepatitis, thalesemia, heart transplant, trauma and other diseases, and also for patients of road accidents, which occur as a routine rather than exception in Pakistan.

Access to safe blood transfusion is a basic human right and also integral part of modern medicine system. According to Red Crescent Society of Pakistan (2011), for 18 persons, only 1 blood bag is available. On daily basis, 8,000 blood bags in the country are needed as against 4,100 bags supplied, as reported by Fatmide Foundation (2011). Moreover, almost 50% of the blood is either not screened at all or not properly screened,

according to WHO standard operating procedures or national health care guidelines, because of poor capability of technicians and other impediments involved in blood screening (Atta-ur-Rehman, 2011; 2012).

The capability of blood technicians is dependent on many variables including knowledge, skills practices and other factors that impart sufficient experience to technicians for blood screening. The technical training prior to induction in job is prerequisite. The theoretical, as well as practical aspects ought to be a focal point of pre job training. As per World Health Organization (2009) and National Health Care Policy, on job periodical training is a must, and this should be imparted twice a year, and no technician should be left untrained. This aspect is quite important but an unattended segment; health is a neglected sector in the whole country. The lack of in-service training of technicians is a major hurdle in the

upgrading of our blood banks to international standards.

The quality management and quality assurance of blood is a responsibility of the quality control officer and the technician involved in blood screening. Blood quality management includes documentation, internal and external quality validation, accreditation schemes, haemeovigilance and proper disposal of wastes, infection material. The technician ought to be conversant with all these aspects for proper screening of blood, which is usually not the case in most blood banks in Pakistan.

In Pakistan, Blood transfusion authorities (BTAS) have been established to regulate safe blood transfusion practices. However, it has been observed that BTAS have not been instrumental in safe blood transfusion, as fragmental structure and lack of on-the-job training of technicians were main impediments in this regard. The quality management and the quality assurance of blood are far from the desired standard as reported by WHO (2009). The transfusion of poor quality blood has resulted in wide spread of hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV) and other blood related diseases. The intensity of these diseases may be well realized as according to Pakistan Medical Research Council (2009), the spread of hepatitis B and C in a general population of Pakistan is 11.84 million. It has been reported (Zaheer, 2009) that transfusion of contaminated blood caused up to 16 million new infections of HBV, 5 million of HCV and 16,000 HIV globally.

In recent medical practices, the trend is to use blood components rather than the use of whole blood for transfusion. Shamshi (2001) narrated that blood platelets are used for cancer and dengue fever, plasma is used for hepatitis patient and red blood cells are injected to patient of thalesemia. All blood technicians in Pakistan are adequately and properly trained in fractionating of blood. There is dire need of time that technicians may be adequately trained in proper screening of blood and blood components. The health sector can be strengthened specifically if technicians are well versed in blood screening practices, hence periodical training of technicians in modern blood screening techniques and transfusion technology is essential. From the preceding, it can safely be concluded that in proper blood screening and in safe blood transfusion, the role of a blood technician is vital. Hence, this study was conducted with the objective to access the capability of technicians for blood screening in hospitals of Islamabad.

METHODOLOGY

The current survey was carried out in the capital city of Pakistan, Islamabad. For the study purpose, three government administered

hospitals were selected at random. One or two rooms were designated as blood banks, and these blood banks were associated/located within the premises of hospitals. The blood banks taken for the study were, Federal Government Services Hospital, Polyclinic Hospital, Pakistan Institute of Medical Sciences and Social Security Hospital. The blood banks were coded as blood bank facility 1 (BBF1), blood bank facility 2 (BBF2) and blood bank facility 3 (BBF3), and code number of each blood bank and name of respective hospital were kept confidential. A structured questionnaire was developed to assess the knowledge, skills and practices, and also experience of technicians of the three blood banks. The questionnaire of the study includes the following:

1. Qualification;
2. Experience;
3. Job description;
4. On job training;

Have complete knowledge regarding blood screening procedures/ standard operating procedures available at workstation:

1. Skills pertaining to blood screening/transfusion;
2. Knowledge.
3. Awareness of WHO standards/Standard Operating Procedures (SOP);
4. Awareness of National Health Policy guidelines;
5. Ability/skills to screen blood for HBV, HCV and HIV;
6. Capability to use microscope and centrifuge;
7. Ability of technicians to use computers;
8. Capability of flood management and quality assurance.

The permission for the study was taken from the managers of all blood banks under investigation. The information was also collected regarding blood banks' capacity and the techniques and technology used by the technicians. The technicians and all others concerned were informed about the objectives of the study. The interviewee responded in affirmative or otherwise. The data so obtained was tabulated and transformed in percent and frequencies, and inferences were drawn accordingly. The limitations in technicians' capability were highlighted and suggestions were imparted to improve the capability of technicians for blood screening in hospitals of Islamabad, and also, implication of study elsewhere in Pakistan will be documented.

RESULTS AND DISCUSSION

The results pertaining to technicians' capability for blood screening in hospitals of Islamabad are presented in Table 1 and 2. As regards qualification, all the technicians in blood bank facility 1 (BBF1), 2 (BBF2) and 3 (BBF3) had a diploma in medical technology. The experience of technicians in BBF1 and BBF2 was more than ten years. This indicates that working experience of technicians in these two blood banks was adequate but was hampered by use of old routine, stereoscopic blood screening methods. There was no urge and even no opportunity for adoption of modern medical technology for update of blood banks according to international standards. However, the experience of technicians in BBF3

Table 1. Technicians' capability for blood screening in hospitals of Islamabad.

S/No.	Technician's capability	BBF1	BBF2	BBF3
1	Qualification: Diploma in medical technology	Yes	Yes	Yes
2	Experience	>10 years	>10 years	<10 years
3	Job description	Yes	Yes	Yes
4	Technician vaccination of HBV	Yes	No	Yes
5	Formal training-prior to posting	Yes	Yes	Yes
6	On Job Training	No	No	No
7	Training pertaining to transfusion transmitted infection	4 days	7 days	4 days
8	Knowledge of storage temperature	Yes	Yes	Yes
9	Shelf life	Yes	Yes	Yes
10	Usage of disposable tube	Yes	Yes	Yes
11	Knowledge updated as per WHO standards	No	No	No
12	National update as per national blood policy	No	No	No
13	Ability to screen blood for HIV, HBV and HCV	Yes	Yes	Yes
14	Use of microscope and centrifuge	Yes	Yes	Yes
15	Use of computers	Yes	Yes	Yes

BBF1: Blood bank facility 1, BBF2: blood bank facility 2, BBF3: blood bank facility 3.

Table 2. Technicians' capability for blood screening in hospitals of Islamabad.

S/No.	Technician's capability	Frequency (%)
1	Qualification: Diploma in medical technology	100
2	Experience	66.7
3	Job description	100
4	Technician vaccination of HBV	66.7
5	Formal training-prior to posting	100
6	On Job training	0
7	Training pertaining to transfusion transmitted infection 4 days	66.7
8	Training pertaining to transfusion transmitted infection 7 days	33.3
9	Knowledge of storage temperature	100
10	Shelf life	100
11	Usage of disposable tube	100
12	Knowledge updated as per WHO standards	0
13	National update as per national blood policy	0
14	Ability to screen blood for HIV, HBV and HCV	100
15	Use of microscope and centrifuge	100
16	Use of computers	100

Data pertaining to three hospitals of Islamabad, Pakistan.

technicians in BBF3 was less than 10 years. All the technicians had job description in three blood banks.

Technicians were vaccinated against HBV in BBF1 and BBF3, but were not vaccinated in BBF2. It is worth mentioning that all technicians in the three BBFs had received formal training during the study period; there was

lack of in-service training facilities or capabilities but no on-the-job in-service training facility was provided to any technicians in all the blood banks. This was contrary to WHO standards (WHO, 2009) and the National Health Policy guidelines that envisaged that in-service training of technicians ought to be a regular feature. In order to ensure

Table 3. Difference in the key characteristics of the technicians across BBF1 and BBF2.

Characteristic	BBF1	BBF2	Difference	t-value
Age	46	55	-9**	-1.97
Experience (years)	18	13	5*	1.68
Technician vaccination of HBV (dummy)	1	1	0.00	0.00
Training pertaining to transfusion transmitted infection (days)	4	7	3***	2.73

The results are significant at ***, **, * at 1, 5 and 10% levels, respectively.

that technicians are well versed with modern blood screening practices, it is imperative that on job, in-service training should be imparted at least twice a year and no technicians should be left untrained. Though the technicians did not have opportunity of training in blood screening techniques yet the training pertaining to transfusion transmitted infection was given as a workshop of 3 to 4 days in BBF1 and BBF3, and training was for one week in BBF3.

The knowledge of technicians in respect of blood screening was also a subject of investigation. The technicians in all the blood banks had knowledge of temperature at which blood was to be stored. This is a desired attribute as blood is to be stored at optimum temperature, otherwise blood and blood component may deteriorate and even may prove fatal to the patient to whom such blood and blood component are transfused. The technicians were also aware of the shelf life of blood component. If the shelf life of blood component is not kept in view, the use of blood components beyond shelf life may be of little use on transfusion to the patient. The technician had the knowledge that disposable tube was to be used for blood each time, otherwise infection may prevail, causing spread of blood related infectious diseases.

The technicians in all three blood banks were able to screen blood for HBV, HCV and HIV occurrences. The technicians also knew how to use microscope and also how to centrifuge the blood samples. They also had the capability to use computers. The study evidently indicate that technicians in all the blood banks had basic knowledge of blood screening, however at the same time it was visualized that technicians' knowledge was not updated according to WHO standards or the National Blood Policy guidelines in the three blood banks under study. This revealed that outdated methods of blood screening may not cope with modern developments in blood technology and calls for in-service training of technicians in respect of blood screening, and it should be imparted regularly/sequentially.

Table 3 presents the difference in key characteristics of BBF1 and BBF2. The difference in age was negative and

significant at 5% level of significance, indicating that technician of BBF2 were more aged as compared to BBF1. The experience difference was positive and significant at 10% level of significance. The technician vaccination of HBV was included as a dummy variable and there was no difference in technician vaccination of HBV. The training pertaining to transfusion transmitted infection difference was positive and highly significant at 1 % level of significance.

Table 4 presents the difference in key characteristics of BBF1 and BBF3. The difference in age was positive and highly significant at 1% level of significance. Similarly, the difference in experience was also positive and highly significant at 1% level of significance, indicating that technicians of BBF1 were more experienced as compared to BBF3. There was no difference in technician vaccination of HBV and training pertaining to transfusion of transmitted infection. Table 5 presents the difference in key characteristics of BBF2 and BBF3. The difference in age was positive and highly significant at 1% level of significance. The difference in experience was also positive and significant at 10% level of significance. There was no difference in technician vaccination of HBV. The difference in training pertaining to transfusion of transmitted infection was also positive and significant at 5 % level of significance.

The residents of Islamabad Capital Territory are well educated, and quite aware of principles of healthy living. Above all, health care and blood bank situations in the Federal Capital are far better than in the remote rural areas of the country. If the capability of technicians in the Federal Capital is not up to the mark and far below WHO standards or the National Health Policy guidelines, then the situation in far flung areas of the country may be well imagined. Moreover, in remote areas, mostly private blood banks operate with little concern about technicians' capability and also about blood screening practices. Hence, it is of paramount importance that technicians' capability may be enhanced by regular and periodical training, so that proper blood screening is guaranteed and the 2011 World blood day slogan, "more blood, more life" may be realized in true perspective.

Table 4. Difference in Key characteristics of BBF1 and BBF3.

Characteristic	BBF1	BBF3	Difference	t-value
Age	46	35	11***	9.85
Experience (years)	18	06	12**	2.14
Technician vaccination of HBV (dummy)	1	1	0	0.00
Training pertaining to transfusion transmitted infection (days)	4	4	0	0.00

The results are significant at ***, **, * at 1, 5 and 10% levels, respectively.

Table 5. Difference in key characteristics of BBF2 and BBF3.

Characteristic	BBF2	BBF3	Difference	t-value
Age	55	35	20***	12.44
Experience (years)	13	06	7*	1.76
Technician vaccination of HBV (dummy)	1	1	0	0.00
Training pertaining to transfusion transmitted infection (days)	7	4	3**	2.34

The results are significant at ***, **, * at 1, 5 and 10 % levels, respectively.

CONCLUSION AND RECOMMENDATIONS

The study conducted revealed that technicians capability in hospitals of Islamabad was not up to prescribed level but rather far below the WHO standards or National Health Policy guidelines. The technicians need training regarding the safe blood screening. The blood screening is confronted with awful situation that needs to be rectified. This may be done by regular, periodical training of technicians in order to enhance their capability of blood screening. By so doing, the health conditions in Pakistan will certainly improve and people will relish better and healthy life.

It is suggested that technician's capability may be increased in Islamabad and also in remote rural areas of Pakistan to supply safe screened blood for blood transfusion to the patients. Such studies may be extended to other areas of the country as well.

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