Transfusion and Apheresis Science 49 (2013) 565–570

Contents lists available at ScienceDirect

Transfusion and Apheresis Science

journal homepage: www.elsevier.com/locate/transci

Evaluation of health care workers' knowledge and functioning of blood centres in north India: A questionnaire based survey

Anju Dubey [a,*], Atul Sonker [b], R.K. Chaudhary [b]

[a] Department of Transfusion Medicine, All India Institute of Medical Sciences, Rishikesh 249201, India
[b] Department of Transfusion Medicine, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow 226014, India

ARTICLE INFO

Article history:
Received 7 December 2012
Received in revised form 20 August 2013
Accepted 20 September 2013

Keywords:
Blood transfusion services
Laboratory technicians
Staff nurses
Knowledge
Practices

ABSTRACT

For quality, safety and efficacy of blood components, adequate infrastructure and trained manpower are essential requirements. Objective of this study is to analyse existing systems of transfusion services in north India, various testing methodologies practiced and to assess the level of knowledge of health care professionals working at these centres. Participants included laboratory technicians and nurses whose knowledge and various practices at blood centres were assessed using a questionnaire. Knowledge of those having more experience, working at urban blood centres and received an additional training was significantly higher. Only a few blood centres are performing all mandatory tests on donors' samples.

1. Introduction

Efficient functioning of an organization depends upon the availability of resources, both human and non-human. For efficient management of blood transfusion services and ensuring safety of blood supply, availability of adequately trained manpower and infrastructural facilities, including supplies and equipment, is necessary. One of the key element of Good Manufacturing Practice (GMP) for blood collection and processing centres is that every blood centre should have an adequate number of staff with necessary qualification, training and practical experience to carry out safely and effectively all the tasks involved in the production of blood components for clinical use [1]. Minimizing the risks and optimising the benefits of transfusion depend on close collaboration throughout the 'transfusion chain' from blood collection centres to the clinical users of blood [2]. Implementation of standard practices in providing transfusion therapy to the patients depends on the skill and knowledge of health care professionals in the ward. It is important for them to understand the correct and safe way to administer blood and component transfusion as it is a constant and central component of good transfusion practice.

The blood transfusion services (BTS) in India are highly decentralized and lack many vital resources like manpower, adequate infrastructure and financial base. Lack of trained health-care professionals is one of the major constraints in the development and strengthening of BTS in the country. This is due to the lack of training opportunities and clearly-defined work orientation in the professionals working in the field of Transfusion medicine as well as those providing transfusion therapies to the patient. Comprehensive, appropriate and effective educational programmes are required for BTS personnel to help to meet the manpower requirements and development of skills leading to improved implementation of standard operating procedures.

The objectives of this study are to analyse the existing systems of BTS in India, various testing methodologies

* Corresponding author. Address: Department of Transfusion Medicine, All India Institute of Medical Sciences, Virbhadra Marg, Rishikesh 249201, Uttarakhand, India. Tel.: +91 9369999771; fax: +91 5222668017.
E-mail addresses: dranjudubey@gmail.com (A. Dubey), dratulsonkar@-yahoo.com (A. Sonker), rkcsgpgi@gmail.com (R.K. Chaudhary).

1473-0502/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.transci.2013.09.007

practiced and to assess the level of knowledge of health care professionals working at these centres. The assessment made about the current knowledge level may be utilised to design necessary educational programmes as aimless plans often culminate into worthless expenditure.

2. Subjects and methods

This cross sectional study was carried out by department of Transfusion Medicine of a tertiary care teaching hospital of north India. The participants included laboratory technicians and clinical staff nurses who had come to attend various training programmes, organised by the department. Laboratory technicians were from 200 different blood centres of north India. The centres were categorised as major (those catering medical colleges and superspeciality hospitals) and district level blood centres. All participants were working in hospitals that performed blood collection, testing as well as transfusion to the patients.

The questionnaire was prepared after review of literature on similar studies and the framework was derived from WHO manual *Methodological guidelines for socio-cultural studies on issues related to blood donation* [3]. The questionnaire was designed to assess the knowledge and awareness of professional at various centres and to analyse activities performed and methodologies practiced at these centres. Briefly, the questionnaire contained 2 sections. Section I had questions regarding their demographic details and section II had 30 multiple choice questions (MCQ). Blood bank technicians were also enquired about routine functions of their centres and various testing methodologies used.

The MCQ for technicians working at blood centres referred to donor selection, blood collection, component preparation, cross-matching, TTI testing and storage. The MCQ for nurses were related to sample collection, patient identification, recognition of adverse transfusion reactions, storage and transfusion of various blood components in the ward. One point was awarded for every correct answer and 0 for the wrong one. Maximum score for the questionnaire was 30.

The data was analysed using SPSS 17.0 software. ANOVA and t-test were used to test the significance of difference. Post hoc test used was Tukey's. The test at a level of significance of 0.05 was used as a test for independence.

After collection of proforma, lectures were delivered using power point presentation and a hand on training was provided to these professionals on relevant issues.

3. Results

The study comprised of 397 participants, including 282 laboratory technicians and 115 clinical staff nurses. Of the participants, there were 253 (63.73%) males and 144 (36.27%) females. The categorisation of participants according to demographic features is shown in Table 1. Table 2 and 3 show the frequencies of correct responses given by technicians and nurses respectively. All the participants were questioned to assess their knowledge and the sum of responses was summarised as knowledge score. Mean knowledge score of the technicians was 16.92 ± 3.29 (range 9–23) and mean score of nurses was 17.34 ± 3.37 (range 9–24). Comparative analysis of knowledge score was done within the groups according to the demographic categorisation (Table 4). In both the groups, there was no significant difference in the scores of different age groups and genders ($p > 0.05$). However, the knowledge score of those having an experience of 5–10 years in the field of transfusion medicine, working at urban blood centres and who have received an additional training in this field were significantly higher ($p < 0.05$) within their individual categories.

Table 1
Demographic characteristics of the participants.

Characteristics	Laboratory technicians (%) $n = 282$	Clinical staff nurses (%) $n = 115$	Total (%) $n = 397$
Age (years)			
<30	117 (41.49)	51 (44.35)	168 (42.32)
31–40	105 (37.23)	37 (32.17)	142 (35.77)
41–50	50 (17.73)	22 (19.13)	72 (18.13)
>50	10 (3.55)	05 (4.35)	15 (3.78)
Gender			
Male	242 (85.82)	11 (9.57)	253 (63.73)
Female	40 (14.18)	104 (90.43)	144 (36.27)
Experience (years)			
<5	114 (40.43)	47 (40.87)	161 (40.55)
5–10	106 (37.59)	38 (33.04)	144 (36.28)
>10	62 (21.98)	30 (26.09)	92 (23.17)
Type of centre			
Major	173 (61.35)	79 (68.70)	252 (63.48)
District level	109 (38.65)	36 (31.30)	145 (36.52)
Training in Transfusion Medicine			
Yes	57 (20.21)	22 (19.13)	79 (19.90)
No	225 (79.79)	93 (80.87)	318 (80.10)

There were 117 (58.5%) technicians from major blood banks and rest 83 (41.5%) from district level blood banks. Their responses regarding the practice of blood donation at various centres are summarised in Table 5. The average monthly blood donations and percentage of voluntary donation is higher in major (660 and 25.8%) compared to district level blood centres (310 and 10.2%). More numbers of donors are being provided with counselling, informed consent, post donation care and motivation for voluntary blood donation at major blood centres. Copper sulphate method is predominantly used for haemoglobin estimation of blood donors at 101 (86.2%) major and 62 (74.7%) district level blood centres. However, there was no single participating centre that clearly stood out having staff with superior knowledge and better transfusion practices.