

Original Article

Distribution of indications for blood transfusion among the patients of Faridpur, Bangladesh

Biswas T¹, Biswas SK², Rassel M³, Alim MA⁴**Abstract**

For more than a century, blood transfusion is recognized as an important contributor to patients outcome. This study was focused on frequent indications of reported blood transfusions. This cross-sectional type of descriptive study was conducted in Faridpur, Bangladesh among the 719 patients from April, 2013 to July 2013. 30% had non-hemorrhagic anemia, 21% had intra or post-partum hemorrhage, 7% were undergoing haemodialysis, 6% had thalassemia, 4% had trauma, 2% had non-hematological cancer, 1% had leukemia and the rest had other causes. Middle age group and female patients required more transfusions. Moreover, conservative managements required more blood transfusion rather than surgical. However, Patients receiving a blood transfusion are at risk of increased morbidity, mortality, length of stay in hospital & ICU.

Key Words: Blood transfusion, anaemia, haemorrhage

Introduction

Blood transfusion was first used to manage a case of acute blood loss in the nineteenth century when Blundell, as the father of modern autologous transfusion, conceptualized the reinfusion of blood.¹

Transfusion of blood is required commonly when there is anemia due to severe blood loss, due to impaired red cell production or hemolysis.² It is appreciated as a supportive treatment in hematological diseases where within palliative care units, it is less well established.³ Among the blood products, red-cell transfusions are a cornerstone of critical care practice which is used to enhance the supply of oxygen to escape the deleterious effects of oxygen debt.⁴ The indications of blood transfusion more specifically can be a

sudden loss of blood because of trauma, loss of blood during surgery, a low hemoglobin level in blood, bone marrow failure, massive hemolysis, dehydration, thalassemia, hemophilia, hemolytic diseases of the new born^{2,5}, or any kind of severe heart, lung, liver, or kidney disease.^{2,6}

We wanted to find out the distributions of cases of patients having replacement blood donors in a selected region, Faridpur, Bangladesh which is an agro-based district with medium socio-economic status and average health status situated near the capital of the country. We wanted to retrace the World Health Organization data about blood transfusion indications in low income countries for this region. Donors from patients' family, relatives, and attendants were considered as replacement donors and donors unrelated to patient were regarded as voluntary donors. From this study, specifically, we wanted to determine the frequent types of indications of patients of who required blood transfusion.

Methods

It was a cross-sectional type of descriptive study conducted in two voluntary blood donation organizations of Faridpur, Bangladesh from April 2013 to July 2013 among 719 patients whose attendants came to those two voluntary blood donation agencies for blood with patients' hospital report in the defined time. Study inclusion criteria were the patients whose reports were signed by physician and approved by a hospital and the patients whose reports were incomplete or unreadable were excluded. Face to face interview by questionnaires was a procedure to collect information about their patients' basic information and status. Hospital reports including reason for blood transfusion and blood grouping reports were assessed. Independent variables were age, sex, religion, blood group, and type of blood donation while dependent variables were indications of blood transfusion. There were no confounding variables. Statistical methods (e.g. percentages, frequency distribution) were assessed. Data was managed and analyzed in Microsoft excel and SPSS version 21.

Results

Among the 719 patients, (19%) had more than 49 years of age, 16% had age between 29 to 33 years, 15% were between 19 to 23 years old, 12% were between 34 to 38 years old, 10% were less than 19 years old, 8% were between 39 to 43 years old, and only 7% had 44 to 48 years of age. (Table - I)

1. *Tonmoy Biswas, MBBS Final year, Faridpur Medical College, Faridpur. Email: tshexhor@yahoo.com

2. Dr Sunil Kumar Biswas, Associate Professor Department of Medicine, BSMMU, Dhaka

3. Dr Md Rassel, Department of Surgical Oncology National Institute of Cancer Research & Hospital Mohakhali, Dhaka

4. Dr Md Abdul Alim, Medical Officer, Department of Anaesthesiology, BSMMU, Dhaka

*For correspondence

Table-I: Age of the patients who needed blood transfusion (in years)

Month of 2013	<19 years	19 to 23 years	24 to 28 years	29 to 33 years	34 to 38 years	39 to 43 years	44 to 48 years	≥49 years	Total
April	18	21	11	17	11	8	2	27	115
May	27	38	32	40	42	31	28	48	286
June	10	18	24	21	7	5	5	32	122
July	16	30	28	35	22	16	18	31	196
Total	71	107	95	113	82	60	53	138	719

In the defined time, among the patients who asked for blood in the definite blood agencies, 29% were male and 71% were female. In case of religious background of the patient, 85.25% were Muslims, 13.76% were Hindu, 0.14% were Buddhist, and 0.83% were Christian.

We found that about 24% of them had A positive blood groups, 40.2% had B positive blood group, 24.2% had O positive blood group, 8.7% had AB positive blood group, 0.8% had A negative blood group, 1.4% had B negative blood group, and none had AB negative blood group.

Among them, 93.4% collected blood from directly blood donation office, and 6.6% collected blood directly from blood donation program as more emergency case. Among the patients, 58.6% had blood from replacement blood donors, and 41.4% had blood from voluntary blood donors.

Among the patients having A positive blood groups, 31.8% had non-hemorrhagic Anemia, 20.2% had intrapartum hemorrhage, and only 1.1% had leukemia. Among the B positive patients, 27.3% had non-hemorrhagic Anemia, 23.8% had intrapartum hemorrhage, and only 1.0% had leukemia. Among the AB positive patients, 30.2% had non-hemorrhagic Anemia, 15.8% had intrapartum hemorrhage.

Among the O positive patients, 32.8% had non-hemorrhagic Anemia, and 17.8% had intrapartum hemorrhage. Among the A negative patients, 16.7% had non-hemorrhagic Anemia, and 16.7% were pregnant. Among the B negative patients, 50% had non-hemorrhagic Anemia, 30% had intrapartum hemorrhage. Among the O negative patients, none had Anemia, 25% had intrapartum hemorrhage. None of the patients had AB negative blood group. (Figure-1)

Other reasons of blood transfusion were thalassemia, dialysis, accidents, abortions, malignancies & others.

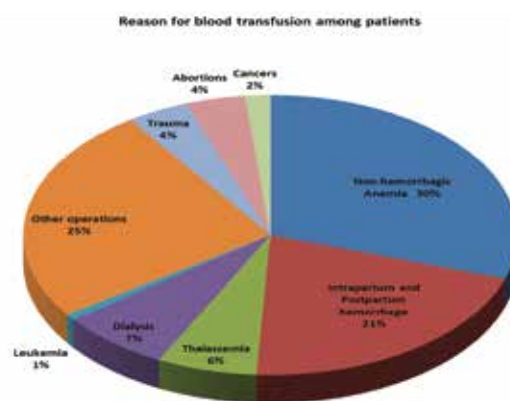


Figure -1: Distribution of cases according to indications of blood transfusion

Discussion

In our study, most of the respondents were from middle age groups. That means, middle aged patients more frequently needed blood transfusion. Results of all other studies found in the database were quite similar to this. But, according to WHO, in low-income countries, up to 65% of blood transfusions were given to children under 5 years of age; whereas in high-income countries, the most frequently transfused patient group was over 65 years of age, accounting for up to 76% of all transfusions there.⁸ So, in this case our result was little different as Bangladesh (country of our study area) is recognized as low income country till now (up to September 2014) according to per capita income. A previous study in the North England showed the mean age of the recipients of individual units as 62.7 years.⁹

Non-hemorrhagic anemia was found as common in the elderly hospitalized patients with a high mortality rate, occasionally accompanying acute myocardial infarction. Previous data suggested that blood transfusion was effective in reducing the short-term mortality rate among this kind of

patients, so in hip-fracture patients.¹⁴ As the age increased, the use of units of whole blood or blood components also raised up among the elderly citizen which was more significant above 65 years of age.¹⁷ The type of anemia of elderly patients can be non-macrocytic anemia, anemia of chronic disorders (ACD),^{16,17} iron deficiency anemia, anemia due to gastro-intestinal cancer,¹⁶ or anemia of unidentified etiology.¹⁷

From our study, we also found that among the patients who required blood transfusion, about 71% were female. Previous studies also showed a prevalence of female patients in indication of blood transfusion.¹⁵ In other countries, the male-female ratio was shown as 43:57¹⁷, 48:52¹⁸, 45:55¹⁵, and as 51:49.⁹ On this basis, in our study, it was 29:71 where ratio of the female patients was significantly higher in spite of having same pattern of indications like those studies. It can be due to low socio-economic status of that area and negligence of female health and maternal issues in village areas. But, there is no established reason behind it which suggests more focus of research in this field. Database showed that severe bleeding during delivery or after childbirth was the most common cause of maternal mortality globally(25%) with a contribution to around 31% of maternal deaths in Asia. To compensate it, women often have to undergo blood transfusion in pregnancy and delivery-related complications and with severe life-threatening anemia.¹⁹

Demographically, most of the patients were Muslim in our study that was certainly due to prevalence of Muslim community in that area and in the country.²⁰

In relation to all blood groups, non-hemorrhagic anemia was the highest among the indications of blood transfusion in our study which accounted for 30% of all blood transfusions. The indication of delivery or postpartum hemorrhage also had a significant percentage(21%).

We also found a large number of patients who needed blood during their surgical procedures. We didn't assess the types their surgeries due to shortage of time. But, review of literature showed that orthopedic, cardiac, gastrointestinal, vascular, urologic, gynecologic, obstetric, breast (mastectomy and mammoplasty), neurologic, plastic, thoracic surgeries often need blood transfusion.^{7,15}

As medical conditions, we documented patients who received blood transfusion were treated for cancer, leukemia, renal dialysis, thalassemia. But, we did not found any gastrointestinal, cardiac, thoracic, neurologic or neonatal indications of blood transfusion which had been shown in

some previous studies.¹⁵ Abortion (4%) was more than expected in our study as a cause of blood utilization which may be backstreet abortion or due to social and cultural factors in that area. More study is needed to find out the reason behind it.

Previous studies suggested that more units were transfused to medical patients than to surgical patients, and a few to obstetrics and gynecology patients;⁹ which were quite similar to the results of our study, because, the total added percentage of noted medical cases in our study was 46% and of noted surgical cases was 29% including trauma. A recent study in south Australia about the trend of blood transfusion showed that over-half of red cells was used for medical conditions and one-third was used for medical conditions. This result is similar to our study and a study of United Kingdom.^{10,11} But, another study from England differed from these studies showing more surgical cases than medical cases among patients receiving blood transfusions.¹²

Results were found different in different region. For example, in case of red cells used in hematology, North England showed 15.5% in 2002⁹, 18.2% in 2006 (excluding iron deficiency anemia)¹¹, South-east England showed 13.1% in 2002¹². Victoria of Australia showed 23.8% in 2009 (including hematinic deficiency, benign and malignant hematology)¹³, South Australia showed 27% (including all hematologic conditions)¹⁰, and our study (in Faridpur, Bangladesh) showed 37% (including all hematological conditions). Therefore, it is clear that indications of blood transfusion varies from region to region and may be influenced by socio-economic, health & demographic factors.

According to WHO, in high-income countries, transfusion is most commonly used in cardiovascular and transplant surgery, massive trauma, and therapy for hematological conditions where in low- and middle-income countries it is used more often to manage pregnancy-related complications and severe childhood anemia.⁸

Though our study was conducted in a region of a low income country, it has showed a larger proportion of blood transfusion due to surgery and hematological conditions with a significant ratio in pregnancy complications and non-hemorrhagic anemia. A prior study in high income countries like Australia and New Zealand showed acute bleeding as the major cause than diminished physiological reserve like anemia.^{7,21}

Anemia is typically treated with blood transfusions to sustain adequate oxygen delivery to tissues.²² In older

individuals it is associated with a very wide series of complications, including enhanced risk for mortality and various systemic diseases.²⁴ Preceding studies in United States suggested that patients in ICU normally had at least one blood transfusion though two-third of them was not associated with acute blood loss¹⁹ but related to a low hemoglobin level.²⁴

Postpartum hemorrhage (PPH) is one of the top five causes of maternal mortality in developed and developing countries and requires blood transfusion as the most important treatment. Studies in developing countries found that its rate among all kind of deliveries was significantly low, but there was possibility of more antenatal or intra-partum risk of PPH.^{25,26} A low lying placenta, Placenta previa, previous cesarean, operative delivery, leiomyoma and maternal age \geq 35 years were significant risk factors for excess blood loss in women during delivery.

During pregnancy, increase in red cell mass, plasma volume and cardiac output affords a compensatory reserve for acute blood loss at delivery. The homeostatic reaction to massive blood loss is in effect in young patients having no medical problems, but poorly in elderly patients.^{27,28} In our study, we found that indication of blood transfusion for delivery was noteworthy (25%) and most of our all patients were more than 35 years of age.

Excluding some screening charges, blood transfusion is totally free in most areas of Bangladesh which may differ from some other countries' scenario. We did not assess harmful effects of transfusion as our main objective was to determine the distribution of indications for blood transfusion among the patients.

The study had some limitations i.e. much larger patient population over a longer time frame could not be assessed, and risk factors and natural histories behind the indications could not be determined. Exclusion of patients' unreadable reports signed by physician has an important impact upon the result of the study; and we know that a small community or area cannot totally represent condition of a large community or area.

Patients admitted with indications of blood transfusion in the hospitals are amongst the most critical cases the health care facilities have to frequently handle. Hence, it calls for adequate preparedness of the hospital administration, timely concern of health workers, medical and surgical care units, health policy makers, public health personnel, blood bank strategies, early awareness of patients, and other associated fields. So, more focus on research in this theme is suggested.

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