Research Article

Open Access Journal of
Biomedical Science
ISSN: 2690-487X

Disease Spectrum and Hematological Profile of Patients Receiving Day Care Blood Transfusion at Rehman Medical Institute

Moula Ghulam[1]*, Danish Shah[1], Najeeb Ullah[1], Mohsin Khan[2], Darakhshan Aziz[1], Asad Akhtar[1], Abdul Qadir Khan[3] and Mahnoor Fatima[3]

[1]*Rehman Medical institute, Pakistan*

[2]*Community Medicine Department, Hayatabad medical complex, Pakistan*

[3]*BHU Ghazi Marjan SD Wazir Bannu, Pakistan*

ABSTRACT

Introduction: Blood transfusions are required so that lost components in the blood may be replaced, particularly after operations. This study is carried out in-order to determine the most common diseases for which blood transfusion is carried out in a private medical hospital in Peshawar, Pakistan. This study also determines any complications that arise from transfusion procedures.

Materials and Methods: The study was a cross-sectional descriptive one which included simple random sampling. The setting was the day care blood transfusion center in the pathology department of Rehman Medical Institute, Peshawar, Pakistan. The data was collected over a period of 1 month in October 2018 and included patients over the past year. Follow up patients were also included in the study. The sample size was 60 and every patient was included until this sample size was reached. The data was filled into questionnaires. The data was entered into SPSS version 22. The results included pie charts, figures and cross tables.

Results: Blood transfusion in the day care transfusion facility was mostly carried out for anemias in females and was carried in males mostly in equal percentages for chronic myelogenous leukemia's and anemia's. Our results showed no transfusion reactions or any complications arising from the procedure.

Conclusion: Blood transfusion is an important treatment option for many diseases and symptoms, the most common of which in females is anemia and in males is either chronic myelogenous leukemia or anemia. Our research and a comparison with other research also helped to prove that transfusion reactions and complication are an extremely rare occurrence. However these risks cannot be ruled out and care must be taken whenever and wherever blood transfusions are carried out.

KEYWORDS: Blood transfusion; Disease spectrum; Hematological profile; Transfusion complications; Anemia's and chronic myelogenous leukemia

INTRODUCTION

Every year about 5 million Americans and many others worldwide receive blood transfusion according to the National Heart, Lung and Blood Institute (NHLBI). Blood transfusions are required so that lost components in the blood may be replaced, particularly after operations. Ideally, it is required when the hemoglobin level falls below 10 g/dL or consequently the fall in hematocrit below 30% [1,2]. About one-third of the patients who

Quick Response Code:

Address for correspondence: Moula Ghulam, Rehman Medical institute, Pakistan

Received: January 12, 2023 **Published:** January 27, 2023

How to cite this article: Moula G, Danish S, Najeeb U, Mohsin K, Darakhshan A, et. al. Disease Spectrum and Hematological Profile of Patients Receiving Day Care Blood Transfusion at Rehman Medical Institute. 2023- 5(1) OAJBS.ID.000538. **DOI:** 10.38125/OAJBS.000538

have had heart surgeries need to have blood transfusions so that the lost blood may be replaced. However, blood transfusion carries its own set of problems if carelessly or unprofessionally carried out, which include the mismatching of different blood groups that may result in a disease known as acute haemolytic transfusion reaction (AHTR), which occurs 24 hours post transfusion [3]. In 7% of the transfusions, one of the most common types of reactions, the febrile non- hemolytic reaction may occur [4]. Another risk it carries, although very low, is the transmission of blood borne infections. The American Red Cross Society states that 1 in 2 million blood transfusions may carry the HIV virus that may potentially infect the recipient. It further claims that 1 in 300000 and 1 in 1.5 million individuals respectively may be infected by Hepatitis B and C in the process. The risk of acquiring the West Nile Virus from a blood transfusion is about 1 in 350000. A report issued by the WHO in July 2016 affirms that complications arising from transfusions have been reduced, by establishing a national blood system with well-organized and coordinated blood transfusion systems.

Furthermore, it states that blood is collected from low risk, regular, voluntary, unpaid donors after which all donated blood goes through quality assured screening for transfusion transmissible infections such as Hepatitis B and C, and Syphilis. It has ensured the rational use of blood in order to reduce unnecessary transfusions and the problems associated with it. The WHO has also implemented effective quality systems in terms of transfusion procedures which include quality management, standards, good manufacturing practices, documentation, training of all staff and quality assessment. Another study by the University of Chicago, College of Medicine in Oct 2016 shows that before any transfusion should actually take place, the samples of blood from either of the individuals (donor and recipient) be checked for their compatibility. This step in the transfusion process could drastically reduce the complications arising later on. To keep complications to a minimal, another study stresses on giving a trigger level lower than (10g/ d-L) at around (7-8g/ d-L) to further lower any risks of transmission of infections and for better patient outcomes [5].The study is conducted in order to observe the patients receiving blood transfusion at our local hospital and to review the current status of risk diseases caused by blood transfusion in the developing world with the purpose of minimizing the said complications. Many diseases as described earlier can be transmitted through blood transfusions into a healthy individual, it is therefore necessary that certain changes be brought into the blood transfusing techniques that minimize this transmission.

MATERIALS AND METHODS

The study was a cross-sectional descriptive one which included simple random sampling. The setting was the day care blood transfusion center in the pathology department of Rehman Medical Institute, Peshawar, Pakistan. The data was collected over a period of 1 month in October 2018 and included patients over the past year. Follow up patients were also included in the study. The sample size was 60 and every patient was included until this sample size was reached. The data was filled into questionnaires. The data was entered into SPSS version 22. The results included pie charts, figures and cross tables.

RESULTS

In Table 1 the total number of patients receiving transfusion from which data was collected was 60, in which 35% were male and 65% were female. The percentage of patients below the age of 20 years was 29.3%, those between the ages of 20 to 60 years was 39.7% and those above the age of 60 years was 32.8%.

Table 1: Age and gender frequency table (n=60).

Variables	Frequency	Percentage
Age		
1-20 Years	17	29.31
21-40 Years	5	8.62
41-60 Years	18	31.03
61-80 Years	18	31.03
Above 80 Years	1	1.72
Missing	2	3.33
	Total: 60	Total: 100%
Gender		
Male	21	35
Female	39	65
	Total: 60	Total: 100%

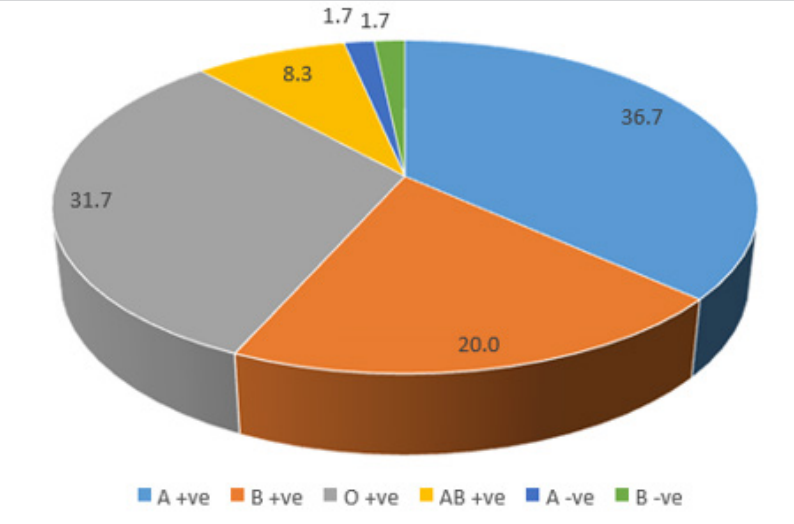

Figure 1: Blood groups of the patients receiving transfusion.

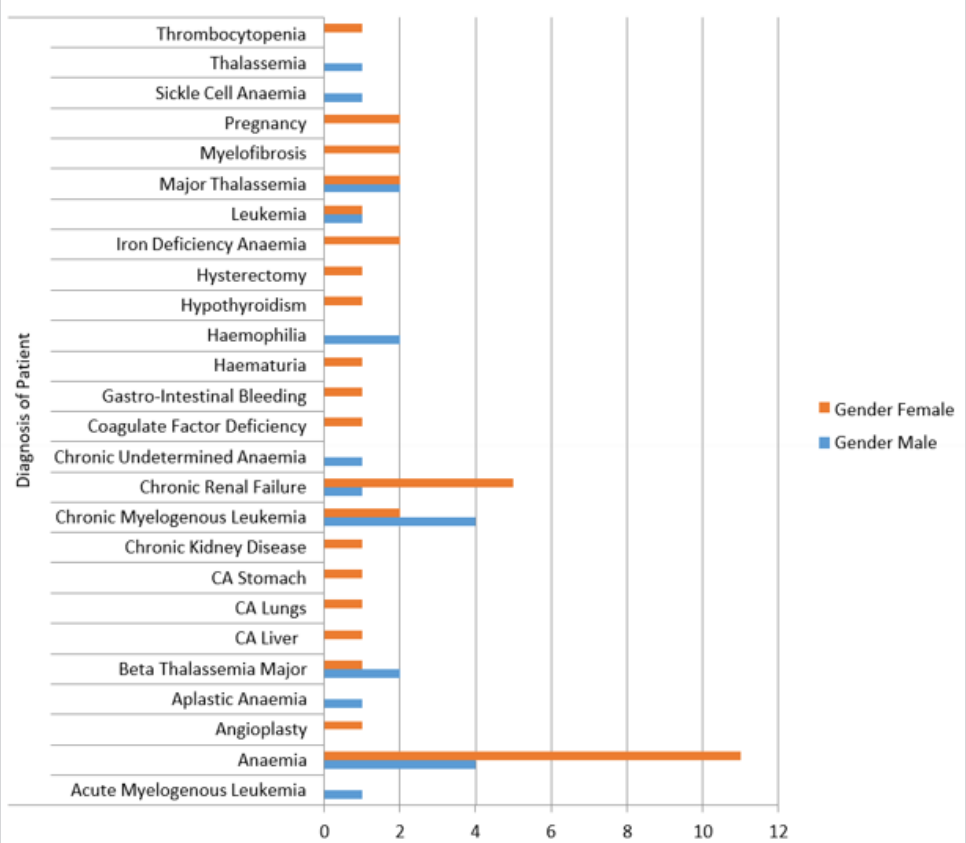

Figure 2: Cross tabulation between diagnosis and gender of the patients receiving transfusion.

In Figure 1 the majority of patients had A+ve blood group at 36.7%, O+ve was 31.7%, B+ve was 20%, AB+ve was 8.3%, A-ve and B-ve each had 1.7% of the total patients (60).

In Figure 2: The most common symptom for which females received blood transfusion in the studied population was anaemia which accounted for 18% of the blood transfusions received. The most common symptom and disease for which males received blood transfusion in the studied population was anaemia at 6.6% and chronic myelogenous leukaemia at 6.6% respectively.

In Figure 3 this figure shows a comparison between the genders and haemoglobin count (g/dL) of the patients receiving blood transfusion. Most of the females (40%) receiving transfusion have an HB count between 7.0 to 9.0 g/dL. Most of the males (20%) receiving transfusion also have an HB count between 7.0 to 9.0 g/dL.

In Figure 4 this figure shows a comparison between the diagnosis of the patients with their haemoglobin count in g/dL receiving blood transfusion.

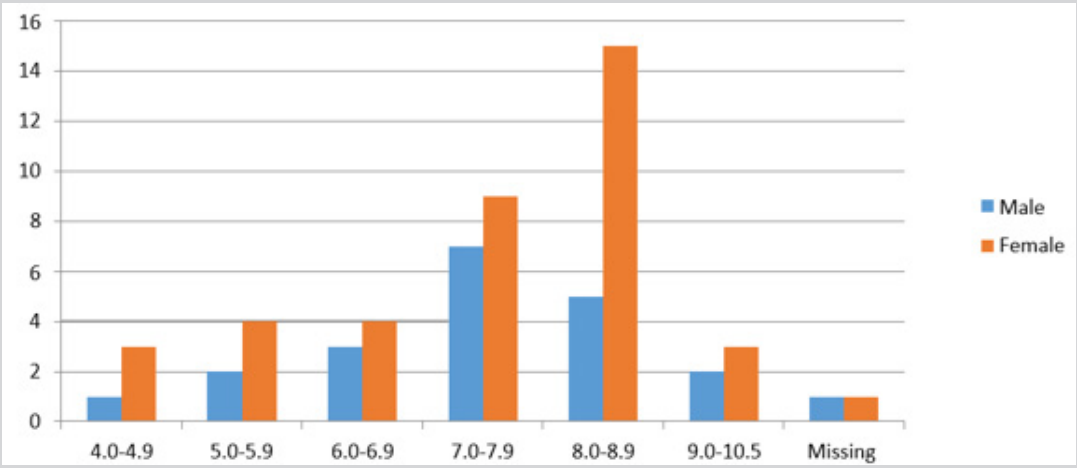

Figure 3: Cross tabulation between the hemoglobin count and gender of the patient receiving transfusion.

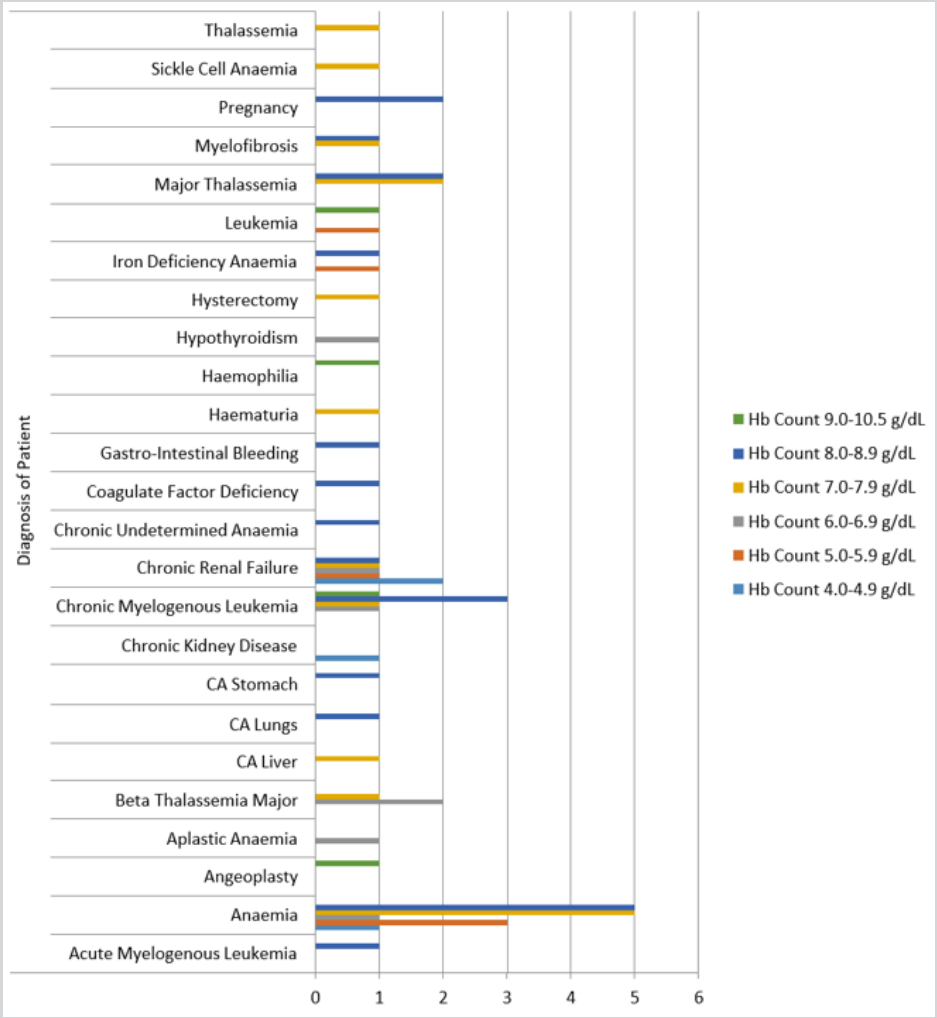

Figure 4: Cross tabulation between diagnosis and hemoglobin count of the patient receiving transfusion.

In Figure 5 this figure shows the comparison between the blood groups and the diagnosis of the patients receiving blood transfusion.

In Figure 6 this figure shows the type of transfusions given to patients having the diseases/symptoms in the studied population mentioned above. Most of the patients received red blood cells (RCC). Some of the patients also received fresh frozen plasma (FFP) and platelets.

In Figure 7 the total number of transfusions received for the diseases/symptoms in the studied population mentioned above. The maximum number of transfusions received for a disease was 6 in acute and chronic myelogenous leukaemia.

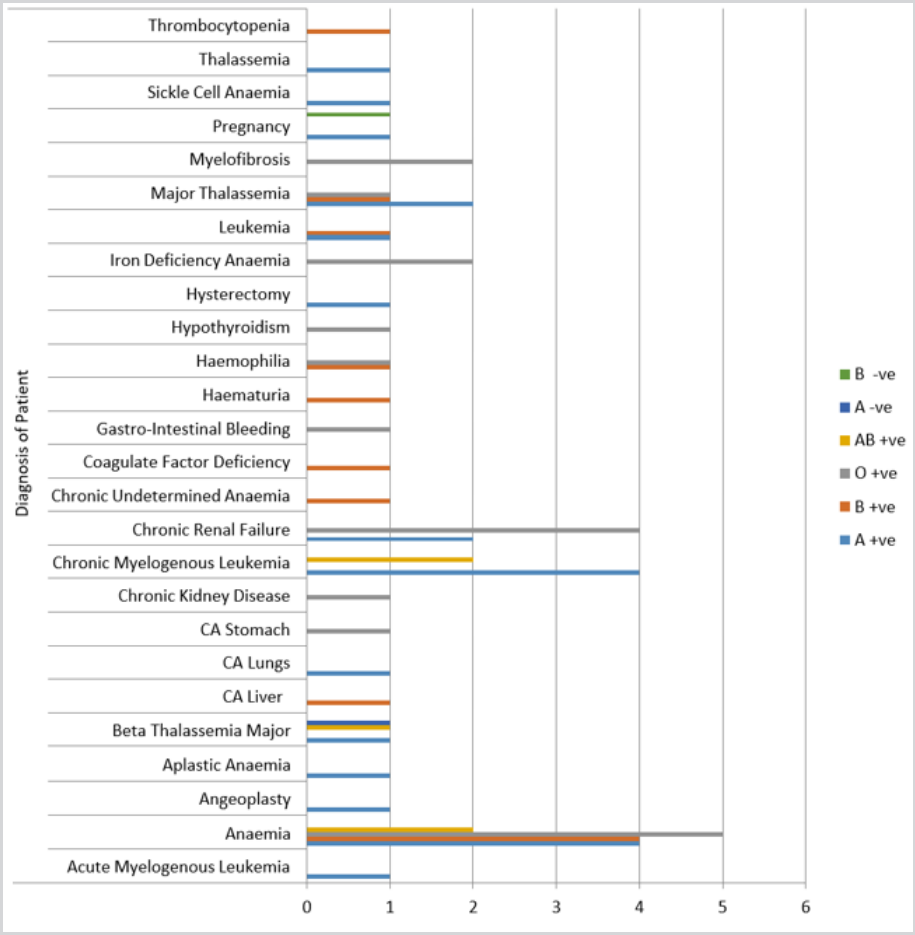

Figure 5: This figure shows the comparison between the blood groups and the diagnosis of the patients receiving blood transfusion.

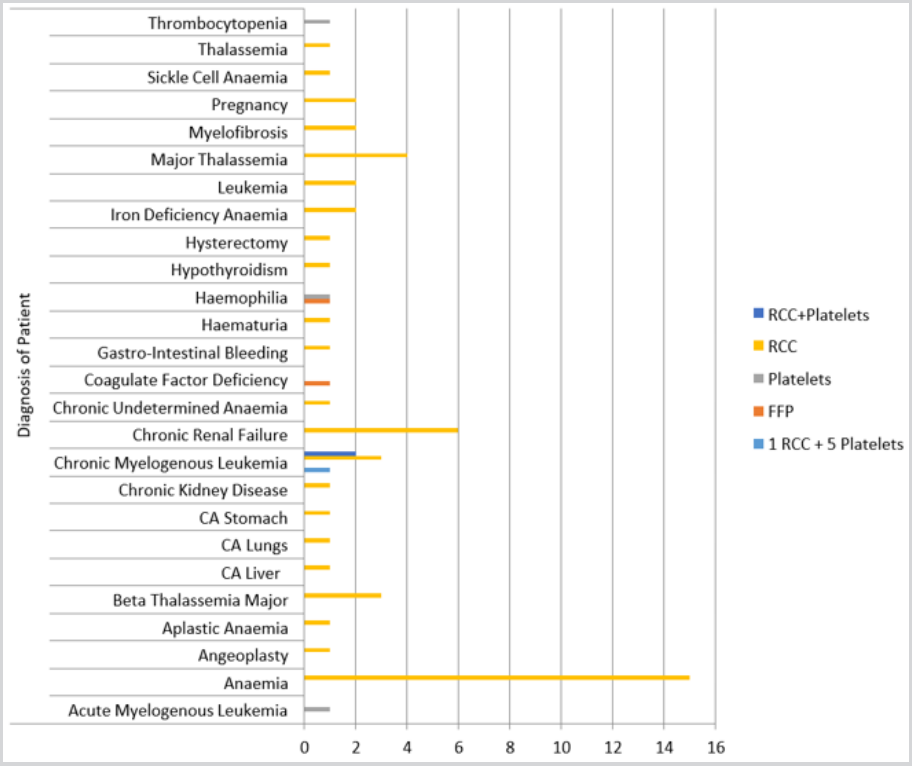

Figure 6: Cross tabulation between diagnosis and type of transfusion received by the patient.

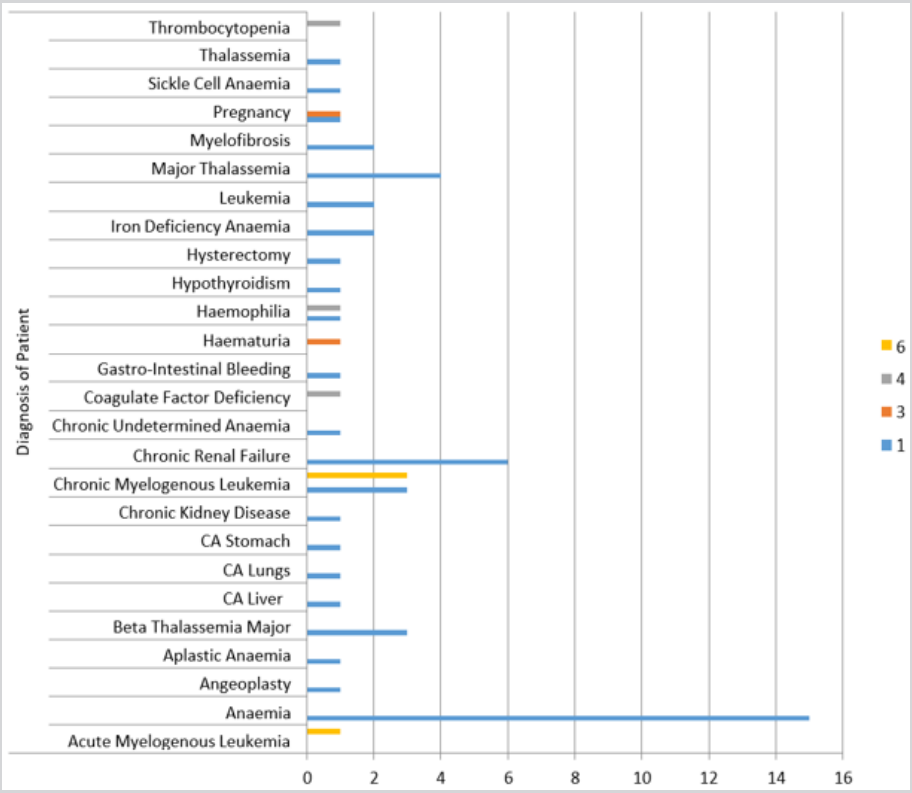

Figure 7: Cross tabulation between the diagnosis and total number of transfusions received by the patient.

DISCUSSION

The research was carried out in order to determine the diseases for which blood transfusions were mostly carried out and also to ascertain whether complications arose and if they did, which were the most common. The data we obtained showed that blood transfusion in females was mostly due to anemia's (18%) and in males was either due to chronic myelogenous leukemia or anemia, each of which accounted for (6.6%). Our research also helped us determine comparisons between blood groups, hemoglobin count and the diseases for which transfusions were being received. The number of patients receiving blood transfusion having either hepatitis B, hepatitis C, HIV or CMV was (3) out of the sample size of (60) which accounted for (5%) on the total sample size. There were no transfusion reactions or complications that took place in our sample size and no transfusion was discontinued for any unwanted reasons. Acute transfusion reactions are typically classified into transfusion related acute lung injury, circulatory volume overload, bacterial contamination, endotoxemia, acute hemolytic reactions, non-hemolytic febrile reactions and allergic reactions.

Modern day transfusion therapy, even though safe, is associated with non- infectious complications such as transfusion-related reactions. Studies were undertaken to determine the incidence of the reactions to correct their cause and prevent recurrences. Packed red blood cells were also the most common component associated with the transfusion reactions [6,7]. Blood transfusion is a treatment modality which has definite potential benefits and risks which vary among patients. An adverse transfusion reaction (ATR) is an unfavourable reaction to the transfused unit, the severity of which may be different among individuals depending upon the type of reaction and the patient's susceptibility. It cannot be predicted which patients will have such a response to blood transfusion, so it is important for the clinical and laboratory personnel involved in the procedure to have a knowledge of the types of reaction and steps to be taken in such a case. It is important to identify various adverse reactions so that steps can be taken to minimize such reactions and add safety to the transfusion being carried out [8-10]. According to an article published in The New England Journal of Medicine, the risk of transmitting HIV, HTLV, HCV or HBV infection by the transfusion of screened tests will reduce the risks even further [11]. Another research article proved that the use of blood donor history and state-of-the-art FDA-licensed serological and nucleic acid testing (NAT) assays have greatly reduced the "infectious window" for several transfusion- transmitted pathogens [12].

LIMITATIONS

Our research limitations included our sample size being small (i.e., 60). We limited our research to only one private hospital. Including other private and public hospitals would have provided a better look into transfusion-related problems. The time over which our research was conducted was very short. Another major limitation included parts of our questionnaire remaining unfilled due to lack of data. If this data was provided a better comparison into the hematological profile and the diseases for which the patients receive the transfusion could be made.

RECOMMENDATIONS

Recommendations include increasing the sample size to at least 200 in every hospital for a better data comparison. Hospitals from both public and private sides should be included. A full hematological profile should be taken for better comparisons.

CONCLUSION

Blood transfusion is an important treatment option for many diseases and symptoms, the most common of which in females

is anemia and in males is either chronic myelogenous leukemia or anemia. Our research and a comparison with other research also helped to prove that transfusion reactions and complication are an extremely rare occurrence. However, these risks cannot be ruled out and care must be taken whenever and wherever blood transfusions are carried out.

REFERENCES

1. Adams RC, Lundy JS (1942) Anaesthesia in cases of poor surgical risk; some suggestions for decreasing risk. Surgery Gynaecology and Obstetrics Journal 3: 603-307.
2. Carson JL, Grossman BJ, Kleinman S, Tinmouth AT, Marques MB, et al. (2012) Red blood cell transfusion: a clinical practice guideline from the AABB. Ann Intern Med 157: 49-58.
3. Covin RB, Evans KS, Olshock R, Thompson HW (2001) Acute hemolytic transfusion reaction caused by anti-Coa. Immunohaematology 17(2): 45-49.
4. Bassuni WY, Blajchman MA, Al-Moshary, May A (2008) Why implement universal leukoreduction? Haematol Oncol Stem Cell Ther 1(2): 106-123.
5. Jeffrey LC, Simon JS, Nareg R (2016) Transfusion thresholds and other strategies for guiding allogeneic red blood cell transfusion. Cochrane Database Sys Rev 10(10): CD002042.
6. Sahu S, Hemlata, Verma A (2014) Adverse events related to blood transfusion. Indian J Anaesth 58(5): 543-551.
7. Khoyumthem P, Rachandra K, Goswami S, Lyngdoh N, Sharma AB, et al. (2018) Acute transfusion reactions in a tertiary hospital: A 2-year retrospective study. Journal of Medical Studies 32(1): 47-50.
8. Negi G, Gaur DS, Kaur R (2015) Blood transfusion safety: A study of adverse reactions at the blood bank of a tertiary care center. Adv Biomed Res 4: 237.
9. Allain JP, Reesink HW (2009) Transfusion-transmitted infectious diseases. Biologicals 37(2): 71-77.
10. Bihl F, Castelli D, Brander C (2007) Transfusion-transmitted infections. Journal of Translational Medicine 5: 27.
11. Schreiber GB, Busch MP, Kleinman SH, Korelitz JJ (1996) The risk of transfusion-transmitted viral infections. New Engl J Medicine 334(26): 1685-1690.
12. Lindholm PF, Annen K, Ramsey G (2011) Approaches to minimize infection risk in blood banking and transfusion practice. Infecti Disord Drug Targets 11(1): 45-56.