DOI: 10.18410/jebmh/2015/952

ORIGINAL ARTICLE

ASSESSMENT OF PATTERN OF BLOOD TRANSFUSION IN PATIENTS WITH SICKLE CELL ANEMIA FROM A TERTIARY HEALTHCARE CENTRE IN CHATTISGARH

Pratima Kujur[1], Chandrakala Joshi[2]

HOW TO CITE THIS ARTICLE:
Pratima Kujur, Chandrakala Joshi. "Assessment of Pattern of Blood Transfusion in Patients with Sickle Cell Anemia from a Tertiary Healthcare Centre in Chattisgarh". Journal of Evidence based Medicine and Healthcare; Volume 2, Issue 41, October 12, 2015; Page: 6974-6980, DOI: 10.18410/jebmh/2015/952

ABSTRACT: Sickle cell Anemia is an autosomal recessive genetic haematologic disorder. Although, Red cell transfusion is currently the most accepted therapy for most acute and many chronic complications of Sickle cell Anemia patients. **AIM:** To assess total number of transfusions, age at the start of transfusion, time interval between transfusions, indications and Transfusion Transmitted Infections (TTI). **MATERIAL AND METHODS:** This is a prospective study in a blood bank in a tertiary care hospital in Raipur, over a period of 1 year. A total of 350 Sickle cell Anemia patients who were already diagnosed were included in study. **RESULTS:** Out of 13208 blood units, 849(6.42%) were transfused, 79.15% transfusion was done between ages 1–5 years. 36% patients had pretransfusion haemoglobin level below 6.0 g/dl presented with anemia and other complications. Seropositivity was found for viral markers i.e. HIV 1 & 2 and HBV, 0.57% and 0.28% respectively. **CONCLUSION:** 87.5 % transfusions observed between 0-1 month interval. Hydroxyurea is a drug that is used to help complications of Sickle cell Anemia patient and reduces demand of transfusion.

KEYWORDS: Sickle cell Anaemia, Indications, Transfusion Transmitted Infection (TTI).

INTRODUCTION: Sickle Cell Anemia is the most prevalent inherited blood disorder worldwide.[1,2] In HbS a single point mutation results in a glutamic acid replacing valine. Sickle cell Anemia was first described in 1910 by Herrik.[3] Sickle cell hemoglobinopathy is a common health problem in Chhattisgarh, out of 26 million population nearly 27% of population suffered with heterozygous haemoglobin trait (HbSC, SC group) and 2.5% with fatal homozygous haemoglobin disease (HbSS, SS group).[4] Prevalence of SCD in Madhya Pradesh including Chhattisgarh was 1-40.0%[5]; and in another study SCD in Chhattisgarh 3.2-22.5%.[5,6] Chhattisgarh screening programme for sickle haemoglobin focuses on children aged 3-13years, frequency of Sickle cell trait was 9.64% and of SS phenotype was 0.29% with only two districts.[7] Prevalence of Sickle cell trait was 10.6%, Sickle cell disease was 0.66% in three districts. Maximum number of HbSS were 2.29% in children in age group of 0- 5 years and HbAS were 15.6% in age group of 21-25 years.[8]

The use of Blood Transfusion in secondary prevention of stroke was first described in 1970 and is now used routinely in paediatric and adult patients.[9] Patients with Sickle cell Anemia require chronic blood transfusion and thus they are at serious risk of transfusion transmitted viral infections.

In our study, an experience of blood transfusion among sickle cell disease patients, after which the frequency of transfusion and its pattern and related problems were determined.

DOI: 10.18410/jebmh/2015/952

ORIGINAL ARTICLE

AIM AND OBJECTIVES: To assess the pattern of Blood Transfusion in patients with Sickle Cell Anemia i. e.,

- Number of blood units transfused,
- Age at start of transfusion,
- Interval between transfusions,
- Indications for Blood transfusion,
- Transfusion Transmitted Infections (TTI).

MATERIAL AND METHODS: This is a prospective observational study performed in the blood bank, Department of Pathology, Pt. J. N. M. Medical College & Dr. B. R. A. M. Hospital Raipur (CG), over a period of 1 year, from January 2013 to December 2013. Patients of all age groups and both sexes were included. The study was approved by Hospital ethics committee. Written consent was taken from each patient. Relevant clinical and laboratory data was collected with reference to age at the start of transfusions, total number of transfusion received. A total number of 350 Sickle cell Anemic patients sample were subjected to screening for serological tests i.e. HIV, HBV and HCV by using semiautomated Enzyme- Linked Immuno Sorbent Assay (ELISA) processor. 5ml of peripheral venous blood was collected in Ethylene Di-amine Tetra-acetic acid (EDTA) – anti-coagulate vacutainer under strict sterile condition and serum was separated. Complete Blood Count, reticulocyte count, peripheral smear examination, and biochemical tests i.e. blood urea, serum creatinine, electrolytes was done.

Inclusion Criteria: All Sickle Cell Anemic patients (Hb Electrophoresis and HPLC confirmed cases) were presented to the blood bank for Blood Transfusion and were willing to participate in the study.

Exclusion Criteria: Sickle cell Anemic patients who were not received Blood Transfusion Patients who received Blood Transfusion but not have Sickle Cell Anemia.

RESULTS:

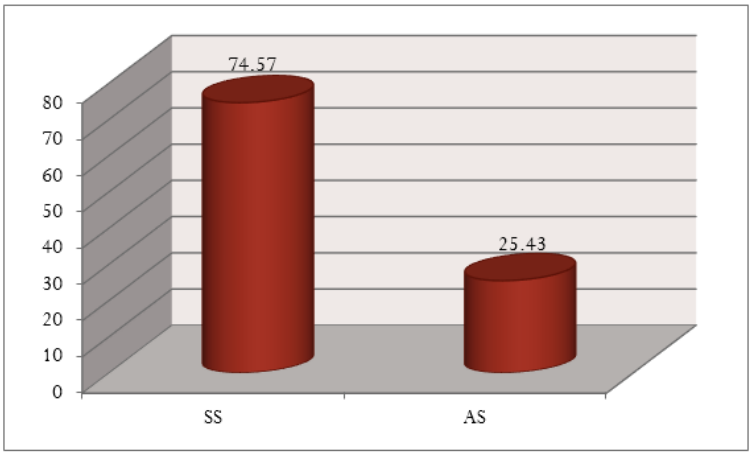

Fig. 1: Prevalence of Blood Transfusion

DOI: 10.18410/jebmh/2015/952

During study period, a total of 350 Sickle cell patients were retrieved. 261(74.57%) patients were HbSS, 89 (25.43%) patients were HbAS. The age ranging from of 0-82 years. Male: female ratio was 1.1:1. Most 74% of the patients were diagnosed between 1-5 years of age. [Figure 1]

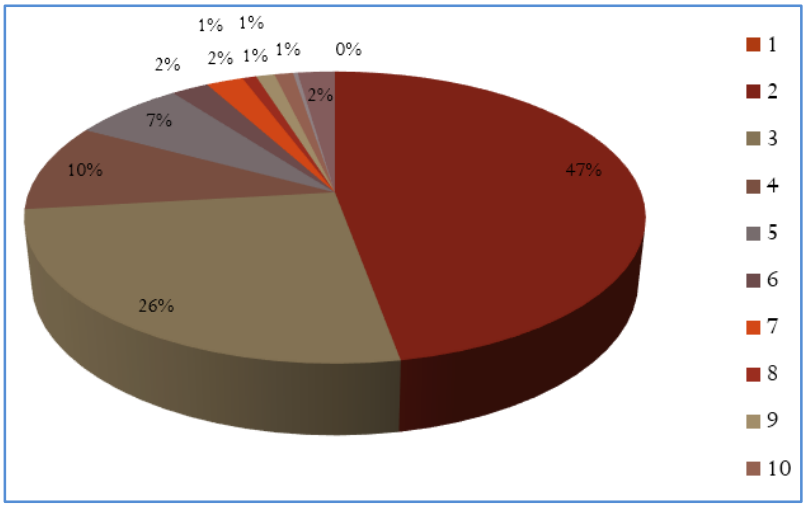

Fig. 2: Number of Blood Transfusion

In this study prevalence of blood transfusion was 165(47%) transfused one time and 8(2.3%) were transfused more than 10 times. [Figure 2]

Age (year)	0-2	3-5	6- 12	13- 15	>16	Total
Transfusion	196	70	60	21	03	350

Table 1: Age at start of transfusion

In this study, 196(56%) patients were transfused in first two years of life, 3(0.85%) patients were transfused after the age of more than 16 years. [Table 1]

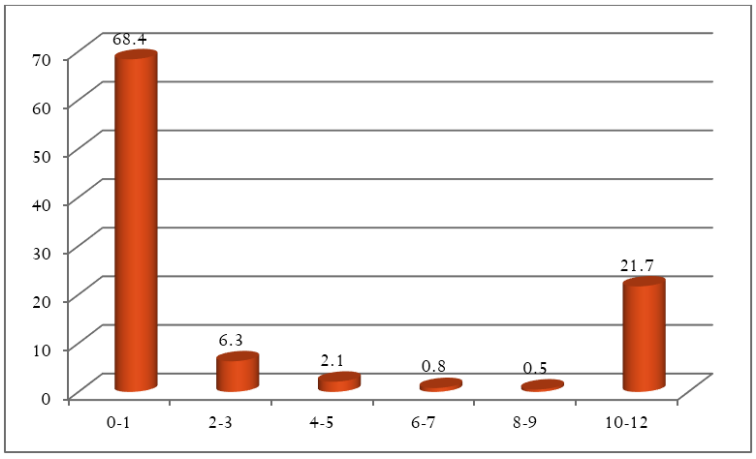

Fig. 3: Time interval between Transfusions

DOI: 10.18410/jebmh/2015/952

In study period minimum time interval between transfusions was 0-1 month (68.4%) and maximum time interval between transfusions was 10-12 months (21.7%). [Figure 3]

Indications	No. of Patients	%
Anemia	118	33.6
Acute painful episodes (vasooclusive crises)	101	28.9
Acute chest syndrome	100	28.8
Preoperative	14	4.0
Uncomplicated pregnancy	06	1.7
Miscellaneous	11	3.0

Table 2: Indications for Transfusion

In present study period, frequency of transfusion was 33.6% in Anemia followed by 28.9% in Acute painful episodes (vasooclusive crises), 28.8% in Acute chest syndrome, 4.0% in preoperative cases, 3% in Miscellaneous and 1.7% in uncomplicated pregnancy. [Table 2]

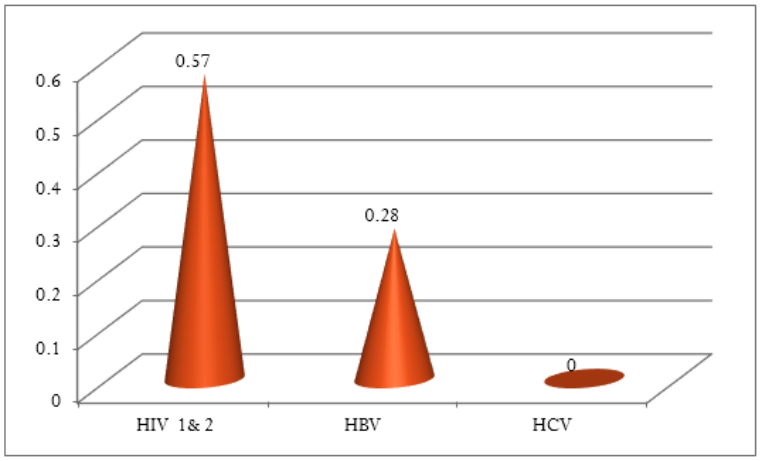

Fig. 4: Distribution of Seropositivity

In this study, three patients were found seropositive 0.85% for viral markers in HIV 1 & 2 and HBV 0.57% and 0.28% respectively. [Figure 4]

DISCUSSION: The frequency of pattern of Blood transfusion is reported by different studies. In this study, 6.42% blood units issued to Sickle cell Anemia patients. However, a study by V. Mehta et al in 2013 reported frequency of transfusions was 5.2%.[10]

In this study, frequency of HbSS genotype patients reported 74.57%. Similar study reported by Hassan M et al in 2003 frequency of HbSS 88% 1.[11] By Driss F et al in 2007 reported 85% in pregnant women.[12] B. E. Otaigbe et al in 2013 reported frequency 99%.[13]

In this study, pre transfusion Haemoglobin level below 6.0 g/dl reported in 36% patients. V. Mehta et al in 2013, reported below 6.0g/dl in 40%.[10]

DOI: 10.18410/jebmh/2015/952

In this study, frequency of first transfusion during age range of 0- 2 years reported 56% Similar study, by Barbara Otaigbe et al in 2013 reportd 57%[13] LTshilolo et al in 2007 reported 57.64%,[14] A. N Ikenfuna et al in 2007 reported 44.24%,[15] Thaeme J R et al in 2001 41%.[16]

In this study, indication of transfusion in Anemia reported 33.6%. Similar study, by Barbara Otaigbe et al in 2013 reported 73 %[13].

In this study, indication of transfusion in Acute painful episodes (vasooclusive crises) reported 28.9 %. Similarly, Qutaiba Amir Tawfic et al in 2012 reported 16.1%[17] by Barbara Otaigbe et al in 2013 reported 80%,[13] by A N Ikenfuna et al in 2007 reported 9.6%,[15] by Akinyanju et al 1987 reported 45%.[18]

In this study, indication of acute chest syndrome reported 28.8%, similar study reported by Qutaiba Amir Tawfic et al in 2012 in 69.6%, by Thaeme et al in 2001 in 28.9%.[16]

In this study, indication of uncomplicated pregnancy reported 1.7%, preoperative indication reported 4% and miscellaneous indications reported 3.0%in patients of nonhealing ulcers, renal failure, shock, priapism and hepatopathy. Such types of indications were not reported in any study.

In this study, seropositivity for viral markers i.e of HIV 1 & 2 and HBV reported 0.57% and 0.28% respectively. Similarly, by Barbara Otaigbe et al in 2013 reported seropositivity of HIV 1 & 2 and HBV, 0.76% and 0.76% respectively[13] by L Tshilolo et al in 2007 reported seropositivity of HIV 1 & 2, and HBV 11.3% and 10% respectively.[14] Seropositivity of HCV not reported in any study.

CONCLUSION: Blood transfusion is an effective therapy in the acute and chronic treatment of sickle cell disease. Still it is challenging because of complications and TTIs. So other measures for management are public education, study of genetics, detection of genetic risk of the community, family history and premarital genetic counselling should be done. Other measures are splenectomy, hydroxyurea, bone marrow transplant, stem cell transplant and gene therapy. To prevent TTI, Nucleic acid Amplification Testing shortens the window period, there by offering blood centers much higher sensitivity for detecting viral infections.

REFERENCES:

1. Modell & Darlison, Global Epidemiology of haemoglobin disorders and derived service indicator, Bulletin of WHO, 2008, 86, 480 - 487.
2. Weatherall The inherited disease of haemoglobin is emerging global health burden. Blood - 2010, 115, 4331- 4336.
3. Savitt TL, Goldberg MF, Herrick's 1910 case report of sickle cell anemia. The rest of story, JAMA.1989; 261(2): 266-71.
4. Purnima Dey Sarkar, Gopinath Agnihotram, Lincy K. Skaria. Analysis of Liver Dysfunction among Sickle Cell Disease, Population in Bastar Region of Chhattisgarh, Journal of Pharmaceutical and Biomedical Sciences (JPBMS), 2012, Vol. 16, Issue 16.
5. Balgir RS, Sharma SK. Distribution of sickle cell haemoglobin in India.Indian J Hemat, 1988, 6: 1—14.

6. Balgir RS, Genetic Disease Burden, Nutrition and Determinants of Tribal Health Care in Chhattisgarh State of Central-East India: A status paper. Online journal of Health and Allied Sciences, 2011, 10: 1.
7. Patra PK, Khodiar PK, Hambleton I R, Serjeant GR. The Chhattisgarh state screening Programme for sickle cell gene: - a cost effective approach to a public health problem.Journal of community genetics, 2015; doi: 10.100 a/s 12687- 015-0222- 8.
8. Sumantra Panigrahi, P.K. Patra, P.K. Khodiar.The screening and morbidity pattern of sickle cell Anemia in Chhattisgarh. Indian Journal of Hematology & Blood transfusion, March 2015, 31(1):104- 109.
9. Lusher J M, Haighighat H & Khalifa A S. A Prophylactic transfusion programme for children with Sickle Cell Anemia complicated by CNS infarction, American Jour of Haem 1976, 1, 265 -273.
10. V.Mehta, Abhishek Mistry, Bhavesh Raicha, Yazdi Italia, Graham Serjeant. Transfusion in sickle cell disease, Experience from a Gujrat centre, Indian Journal Peditr, 2013, 81 (83), 234- 237.
11. Hassan M, Hassan S, Giday S, Alamgir L, Banks A, Fredrick W, Smoot D, Castro O, Hepatitis C Virus in sickle cell disease. J Natl Med Assoc. 2003; 95 (10): 939- 42.
12. Driss F, Tertian G, Becquemont L, Haddad B, Cynober T, Raphael M, Tchernia G, Management of high risk pregnancy in sickle cell disease by a strategy of prophylactic red cell transfusion or automated red cell exchange, Transfus Clin Biol. 2007; 14 (4): 386- 92.
13. Barbara Otaigbe, Prevalence of blood transfusion in sickle cell anaemia patients in South-South Nigeria: A two years' experience, International Journal of Medicine and Medical Science Research 2013,Vol. 1(1).pp. 013- 018.
14. L. Tshilolo M., R. Mukendi K., and S. Wembonyma O, Blood transfusion Rate in Congolese Patients with Sickle cell anemia, Indian journal of Pediatrics, 2007, Vol. 74.
15. A N Ikenfuna, I J Emodi (2007). Hospital admission of patients with sickle cell anemia pattern and outcome in Enugu area of Nigeria. Niger J Cli Pract. 2007; 10: 24-9.
16. Thaeme J R, HambletonI R, Serjeant G R. RBC transfusion in sickle cell anemia(HbSS): experience from the Jamaican Cohort Study. Transfusion 2001; 41(5): 596-601.
17. Qutaiba Amir Tawfic, Rajini Kausalya, Dhuha AI- Sajee, Jyoti Burad, Ahmed K Mohammed, and Aravind Narayanan, Adult Sickle Cell Disease, A Five-year Experience of Intensive Care Management in a University Hospital in Oman Sultan Qaboos Uni Med J. 2012; 12 (2): 177-183.
18. Akinyanju O, Johnson AO, Acute illness in Nigerian children with sickle cell anemia.Ann Trop Paedia. 1987 Sep; 7(3).

DOI: 10.18410/jebmh/2015/952

ORIGINAL ARTICLE

AUTHORS:

1. Pratima Kujur
2. Chandrakala Joshi

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Pathology, Pt. Jawaharlal Nehru Memorial Medical College, Raipur.
2. Associate Professor, Department of Pathology, Pt. Jawaharlal Nehru Memorial Medical College, Raipur.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Chandrakala Joshi,
A/120, Ekta Parisar,
Malviya Nagar, Durg, C. G.
E-mail: ckj242@gmail.com

Date of Submission: 30/09/2015.
Date of Peer Review: 01/10/2015.
Date of Acceptance: 05/10/2015.
Date of Publishing: 08/10/2015.