Original Article

# Frequency of Seropositivity of Hepatits C in Thalasemia Major Patients

**1. Ali Akbar Siyal 2. Babar Niaz Dahri 3. Tufail Ahmed Balouch**
**4. Muhammad Sadique Siyal**
1. Assoc. Prof. of Pediatric Medicine 2. Medical Officer of Pediatric Medicine 3. Medical Officer in Surgery
4. Consultant of Pediatric Medicine, PUMHS Women, Nawabshah

## ABSTRACT

**Background:** Thalassemia is inherited as an autosomal recessive disorder. Children suffering from beta thalassemia major, due to various genetic defects, have deficient synthesis of ß globin chain of Hemoglobin. They need frequent blood transfusions, so they are at increased risk of transfusion transmitted infections especially HCV.
**Objective:** To evaluate frequency of hepatitis C in thalassemia major patients.
**Study Design**: Prospective descriptive study.
**Place and Duration of Study**: This study was conducted at the Thalassemia care Center Nawabshah, Sindh from 1st January 2011 to 31st December 2011.
**Patients and Methods:** Children ages from 3 months to 14 years with Beta thalassemia major were included. Patients were scrutinized for anti HCV antibodies by third generation ELISA technique.
**Results:** Total of 126 patients of thalassemia major studied in this series, 59 (46.82%) were males and 67 (53.17%) females. Out of these 18 (14.26%) were hepatitis C positive.
**Conclusion:** HCV infection is an important cause of viral infection among thalassemic children with a prevalence of 14.26% in our study population.
**Key Words:** Beta thalassemia, Hepatitis C, Blood transfusion.

## INTRODUCTION

Thalassemia is an autosomal recessive disease prevalent in Pakistan. The carrier rate ranges between 4 and 5.5% in different regions and racial groups[1, 2]. It is estimated that about 9000 children with beta thalassemia are born every year, although no documentary registry is available in Pakistan[3].The cultural and religious scenario in Pakistan is such that consanguineous marriages are quite common[4,5]. Blood transfusion is a necessary treatment for these patients. Regular blood transfusions for patients of thalassaemia have improved the overall survival although these transfusions carry a definite risk of transmission of certain viruses[6]. However, the blood transfusion has its own side effects. Main problems of blood transfusion are transfusion-transmitted infections, especially hepatitis C[7,8] . HCV is responsible for 80 to 90 % of post. Transfusion hepatitis in patients who received blood transfusion prior to introduction of routine blood products screening in 1990[9]. Hepatitis B has a declining trend, probably as a result of regular pre-transfusion screening for HBsAg, use of hepatitis B vaccination and improved public awareness about the disease. HIV infection fortunately, is uncommon in our setup [10]. However, since no such vaccine is so far available against hepatitis C, the only effective protective measure against this virus is provision of HCV negative blood for transfusion. Therefore, screening of transfused blood for HCV in not only mandatory, but also it is essential to use the most sensitive screening methods with least possible false-negative results[10]. HCV seroprevalence and risk factors in north Iran were investigated in 105 Thalassemia sufferers, 93 haemodialysis patient and 5976 blood donors by second generation ELISA. The study showed that haemodialysis patients and thalassemics were at higher risk of having HCV infection; the prevalence being 55.9% and 63.8% respectively in comparison to the prevalence of blood donors (0.5%)[11].

The aim of this study was to look into the frequency of HCV sero-positivity amongst multiply transfused thalassemia major patients in our setup.

## PATIENTS AND METHODS

This Prospective descriptive study was conducted at Thalassemia care Center Nawabshah, Sindh. Duration of study was one year , from 1st January 2011 to 31st December 2011.Children age from 3 months to 14 years with Beta thalassemia major, confirmed on hemoglobin electrophoresis were included. Those children who had Sickle Cell anaemia or any other hemolytic anaemia were not included in this study.
A total of 126 cases of ß-Thalassemia major registered for transfusion management at the aforementioned thalassemia center were selected. After an informed written consent, brief clinical history was recorded and relevant physical examination was carried out. 3 ml blood sample was collected in a disposable syringe under strict aseptic conditions and was allowed to clot Serum was separated in a clear plastic bottle for

further testing. The initial screening was carried out by ELISA (3rd generation ELISA technique).

All the data was entered and Analysis was performed on the Statistical Package for Social Sciences (SPSS version 10.0).

# RESULT

In a total of 126 patients of thalassemia major studied in this series, 59 (46.82%) were males and 67 (53.17%) females, with male to female ratio 1:1.3 (Figure 1). Out of these 18 (14.26%) were hepatitis C positive, among them 9 (50%) were males and 9 (50%) females.

**Table No.1: Age and sex-wise distribution of thalassemic patients n= 126**

| Age (years) | Male | females | Number of patients |
|---|---|---|---|
| 3 mon-< 1 year | 12 | 15 | 27 (21.42%) |
| 1-5 | 27 | 33 | 60 (47.61%) |
| 6-10 | 6 | 14 | 20 (15.87%) |
| 10-14 | 14 | 5 | 19 (15.07%) |
| Total | 59 | 67 | 126 (100%) |

**Table No.2: Frequency of seropositivity of HCV according to age in thalassemia patients (n =18)**

| Age (years) | n | Percentage |
|---|---|---|
| < 1 year | 3 | 16.16 |
| 1-5 | 10 | 55.55 |
| 6- 10 | 3 | 16.16 |
| 10- 14 | 2 | 11.11 |

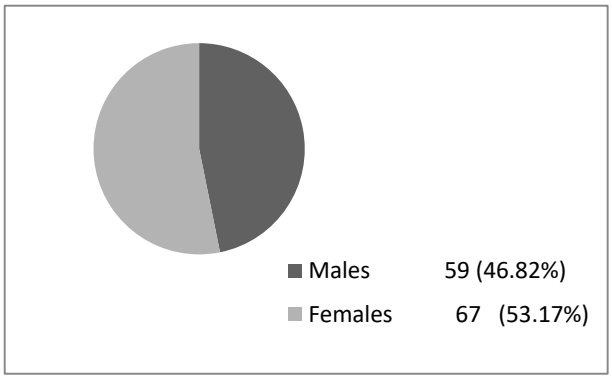


**Figure No1: Sex distribution in thalassemia patients**

Age ranges from 3 months to 14 years. We divided age in different groups from 3 months to <1 year with the mean age 7.5 ± 4.26 months, number of patients were 27 (21.42%). 1 year to 5 years with mean age of 2.41 ±1.89 , number of patients were 60(47.61%). 6years to 10 years with mean age of 7.25 ±3.56 years , number of patients were 20(15.87%). 11 years to 14 years with mean age of 12.57 ± 6.23 years, number of patients were 19 (15.07%) (Table -1). Seropositivity of HCV according to age in thalassemia patients < 1 year number of patient were 3 (16.16%), 1 year to 5 years number of patient were 10( 55.55%), 6years to 10 years number of patient were 3 (16.16%),11 years to 14 years number patient were 2 (11.11%).(Table 2).

# DISSCUSSION

Beta thalassaemia occurs world wide, with a higher prevalence among Mediterranean population in the Middle East, in parts of India, Pakistan and South East Asia[13, 14]. Thalassemia is the commonest inherited disorder in Pakistan with the overall prevalence of 5%. The estimated rate of birth of affected infants is 1.3 per 1000 live births, and about 5250 infants with ß-Thalassemia major are born annually. Married couples both consisting of two carriers have a twenty five percent chance that any child they have will be affected.[12] In Pakistan the β-thalassemia is prevalent in all parts of the country and in all ethnic groups. Pathans have a slightly high prevalence rate 7.96% than Punjabi's 3.26% [13]. The average life expectancy in Pakistan is 10 years and at present the disease load is of 90000 to 100000 patients throughout the country.[3]. Major ß thalassemic patients may need 4-6 bags of blood transfusion per month.

This transfusion is able to directly transfer both microbial and viral infections to recipients especially HCV , HBV & HIV[15].Fortunately, HIV infection is still not a problem in our country, and HBV infection can be, to a great extent, prevented by a pre-transfusion immunization, HCV infection has gained importance particularly as one of the major complications in multiply transfused patients during the last decade. This is especially true for counties where HCV is more prevalent in general population and therefore also amongst blood donors[10]. The prevalence rate of seropositivity increases with the number of transfusions[16]. This post-transfusion hepatitis has significantly contributed to morbidity in thalassemia[17]. It should be remembered that HCV hepatitis is more threatening than HBV hepatitis due to a greater risk of chronic liver disease[16.] There are 126 patients of thalassemia major in present study, 59 (46.82%) were males and 67 (53.17%) females, with male to female ratio 1:1.3. Out of these 18 (14.26%) were hepatitis C positive. Most of the patients were transfused to other centers before getting registered here. Most of them were transfused where status of screening was not reliable.

Hepatitis C virus (HCV) is one of the blood borne viruses with highest prevalence in TM patients. In different parts of the world the prevalence of HCV infection in thalassaemic patients is different. In India it is 16.7%[22] and in Malaysia 22.4%[23]. In another study the prevalence of hepatitis C was 23.8% in thalassaemic patients [21].

In Italy the prevalence of hepatitis C in thalassaemic patients was 47.0%[22] and in Iran 63.8%[23].This is much higher than that of our study.

In Pakistan, 20.7% prevalence of anti-HCV in professional donor from Karachi was reported by Ahmed et al[18]. In a study in Rawalpindi region of Pakistan, the prevalence of hepatitis C in thalassaemic children was 60.0%[19]. Another study from Karachi showed the prevalence rate of 20.5% in thalassaemic patients[20].

The difference is due to variation of prevalence of HCV infection in different parts of the world and difference in screening methodology because third generation ELIZA is 10-100 times more sensitive and specific, compared to particle agglutination test. In many previous studies, the prevalence of HCV antibodies was observed to be reduced after the institution of a regular HCV screening before transfusion[16].

# CONCLUSION

Despite screening of blood donors, HCV infection remains an important cause of viral infection among thalassaemic children. Every donor must be screened before giving blood. Transfusion should be placed at registered hospital and centers, the current study show 14.26% seropositivity of HCV infection in thallassemic patients.

# REFERENCES


1. Hassan K, Ikram N, Dodhy M, Burki UF, Tahir M. Prevalence of ß-thalassemia in and around Islamabad. JRMC 1997;1:18-22.
2. Khattak MF, Saleem M. Prevalence of ß-thalassemia in northern areas of Pakistan. JPMA 1993;42:32-4
3. Lodhi Y. Economics of thalassemia management in Pakistan. In: Ahmed S, editor. Thalassemia Awareness Week ed. Friends of Thalassemia;2003.
4. Ahmed S, Saleem M, Modell B, Petrou M. Screening extended families for genetic hemoglobin disorders in Pakistan. . N Engl J Med 2002 10; 347:1162-8.
5. Bittles AH. The role and significance of consanguinity as a demographic variable. Popul Dev Rev 1994; 20:561-84.
6. Nelson WE, Behrman RE, Kliegman RM, Avin AM. In: Nelson, editor. Text Book of Pediatrics. 16th ed.p.1401-4.
7. Azarkeivan A, Ahmadi MH, Hajibeigi B, Gharebaghian A, ShabehPour Z, Maghsoodlu M. Evaluation of transfusion reactions in thalassemic patients referred to the Tehran adult Thalssemia clinic. J Zanjan Fac Med 2008;1:35-41.
8. Goodnough LT. Risks of blood transfusion. Anesthesiol Clin North America 2005;23:241-52.
9. Arankalle VA, Chadha MS, Jha J, Amrapurkar DN, Banerjee K. Prevalence of anti-HCV antibodies in western India. Indian J Med Res 1995;101:91–3.
10. Younus M, Hassan K, Ikram N, Naseem L, Zaheer HA, Khan MF. Hepatitis C Virus Seropositivity in Repeatedly Transfused Thalassemia Major Patients Int J Pathol 2004; 2(1):20-3.
11. Ansar MM, Kooloobandi A. Prevalence of hepatitis C virus infection in thalassaemia and haemodialysis patients in North Iran-Rasht. J Virol Hepatol 2002; 9: 309-14.
12. Ahmed S, Saleem M, Modell B, Petrou M. Screening extended families for genetic hemoglobin disorders in Pakistan. N Engl J Med 2002; 347: 1162-8.
13. Khattak MF, Saleem M. Prevalence of heterozygous beta-thalassemia in northern areas of Pakistan. J Pak Med Assoc 1992; 42: 32-4.
14. Huang SZ, Zeng FY, Ren ZR, Lu ZH, Rodgers GP, Schechter AN. et al. RNA transcripts of the beta-thalassaemia allele IVS-2-654 C-->T: a small amount of normally processed beta-globin mRNA is still produced from the mutant gene. Br J Haematol 1994; 88:541-6.
15. Higgs DR, Thein Sl, Wood WG. The molecular pathology of the thalassaemia. In: Weatherall DJ, Clegg B, editors. The Thalassaemia Syndromes, 4th ed. Oxford: Blackwell Sciences; 2001.p. 133-191.
16. Al Shayyab M, Baticha A, El Khateeb M. The prevalence of hepatitis B, hepatitis C and human immunodeficiency virus markers in multitrans-fusion patients.J Trop Pediatr 2001;47(4):239-42.
17. Prati D. Benefits and complications of regular blood transfusion in patients with beta-thalassemia major. Vox-Sang 2000;79(3):129-137.
18. Shamsi T, Ahmed A, Taj Z, Vajid MA, Hassan F. Prevalence of hepatitis B, C and HIV virus infection among beta thalassaemia major patients. J Pak Med Assoc 1998; 48: 87-9.
19. Bhatti FA, Amin M, Saleem M. Prevalence of antibody to hepatitis C virus in Pakistani thalassaemics by particle agglutination test utilizing C 200 and C 22-3 viral antigen coated particles.J Pak Med Assoc 1995;45: 269-71.
20. Akhtar S, Moatter T, Azam SI, Rahbar MH, Adil S. Prevalence and risk factors for interfamilial transmission of hepatitis C virus in Karachi, Pakistan.Baillieres Clin Haematol 1998;11:147-62.
21. Laosombat V, Pornpatkul M, Wongchanchailert M, Worachat K, Wiriyasatienku A. The prevalence of hepatitis C virus in thalassaemic patients in the south of Thailand. Southeast Asia J Trop Med Public Health 1997; 28: 149-53.
22. Cacopardo B, Russo R, Fatuzzo F, Cosentino S, Lombardo T, LaRosa R, et al. HCV and HBV infection among multi-transfused thalassaemia from eastern Sicily. Ann Trop Med Parasitol 2002; 96: 197-202.
23. Ansar MM, Kooloobandi A. Prevalence of hepatitis C virus infection in thalassaemia and haemodialysis patients in North Iran-Rasht. J Virol Hepatol 2002; 9: 390-2.