

# The Prevalence of Hepatitis C Virus Infection in Patients With Thalassemia in Zabol City of Iran

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## Abstract

**Background:** Thalassemia patients are at risk of blood borne viral infections because of repeated transfusion of blood products.

**Objectives:** We aimed to determine the prevalence of Hepatitis C Virus (HCV) infection in these patients in Zabol, Iran.

**Methods:** This study was conducted on 152 patients with thalassemia at the center of special diseases of Zabol. Demographic data were collected and serum anti HCV Ab and in seven cases HCV RNA Polymerase Chain Reaction (PCR) was performed.

**Results:** The mean age of patients with thalassemia was  $20.1 \pm 3.3$  that 69.2% of them were male. Thirteen out of 152 patients with thalassemia (8.5%) were HCV Ab positive, which confirmed the polymerase chain reaction (PCR). The prevalence of HCV infection in blood samples before 1995 was significantly higher than after this year ( $P = 0.043$ ).

**Conclusions:** Considering the high prevalence of hepatitis C in patients, who received blood transfusions, it seems necessary to examine blood products and blood donors more closely in terms of transmissible diseases like Hepatitis C.

**Keywords:** Hepatitis C Virus, Thalassemia, Zabol, Iran

## 1. Background

Thalassemia is one of the most common hereditary diseases worldwide. It is an important health problem, causing much morbidity, early mortality and a lot of financial and emotional misery for a family (1). After iron overload, blood-borne infections are the main cause of death in thalassemia patients (2).

Hepatitis C is one of the most important blood born infections. Prevalence of hepatitis C in the general population was reported from 0.2% to 40% in different countries (3, 4). Chronic hepatitis C particularly post transfusion in thalassemia patients, leads to hepatocellular necrosis, fibrosis and cirrhosis. It is accepted as an important cause of morbidity and mortality in these patients (5, 6). The most common way of Hepatitis C virus (HCV) transmission was blood transfusion before 1996 and after that changed to injectable drug abuse (7). From this year onwards, blood products have been tested for transmissible infections. Thus transmission and incidences such infections were dramatically reduced (8, 9).

## 2. Objectives

Because of the importance of Hepatitis C infection and its adverse effect on the society, we assessed the prevalence of HCV infection among patients with thalassemia in the city of Zabol, during year 2013. No similar study has been done in Zabol so far.

## 3. Methods

This cross sectional-descriptive study was carried on all patients registered in special diseases center of Zabol city, Iran, before year 2012. Thus, a total of 152 thalassemia patients were recruited.

A check-list of demographic information such as age and gender was filled for each patient based on their documents at the center. Hepatitis C virus infection was tested for every one by serum Anti HCV Ab (using the enzyme linked immunosorbent assay (ELISA) method with Pish-tazteb kit, Pishtazteb company, Iran) and in seven cases HCV RNA real time-polymerase chain reaction (RT-PCR) (Artus and Amplisens kit, Qiagen company, Iran) was done.

Finally, we analyzed the data by SPSS ver 16 software and descriptive tests including frequency, mean and standard deviation.

#### 4. Results

The mean age of HCV-positive thalassemia patients was  $20.1 \pm 3.3$  years. The youngest patient was 14 and the oldest was 27. Sixty-nine percent of thalassemia patients were male.

Among 152 thalassemia patients, 13 (8.5%) were infected by HCV. From these 13 patients with HCV-positive serology test, HCV RNA PCR was done in five cases that not only approve serology, but also show 2 cases with 1a, 2 cases with 3a and 1 case with 4 genotype.

In general, 65 patients with thalassemia and hemophilia received blood transfusion before 1995 and 87 patients after that. The rate of HCV infection before 1995 was significantly higher than after this point ( $P = 0.041$ ). (Table 1)

**Table 1.** Hepatitis C Ab Status and Date of First Blood Transfusion in Thalassemia Patients<sup>a,b</sup>

| Date of First Transfusion | Hepatitis C Ab |           | Total     |
|---------------------------|----------------|-----------|-----------|
|                           | Positive       | Negative  |           |
| Before 1995               | 10 (76.9)      | 55 (39.5) | 65 (42.7) |
| After 1995                | 3 (23.1)       | 84 (60.5) | 87 (57.2) |
| <b>Total</b>              | 13 (100)       | 139 (100) | 152 (100) |

<sup>a</sup>Values are expressed as No. (%).

<sup>b</sup>Chi-square test result: P-value = 0.041.

#### 5. Discussion

The result of this study showed that in Zabol city of Iran, 8.5% of thalassemia patients were infected with HCV. Many studies have been done to determine HCV infection in chronic blood receivers. In Isfahan, the prevalence of HCV Ab Among thalassemia and hemophilia patients were respectively 10.9% and 64% (10). Also 26.1% and 15% of thalassemic patients were reported to have HCV infection in Qazvin and Karaj, respectively (11, 12). In Abu-Ali-Sina hospital of Sari the frequency of HCV Ab positive patients was 15% (13). In Khuzestan, Boroujerdnia et al. showed that 10.6% of thalassemia patients were HCV Ab positive (14). It seems that prevalence of HCV infection in Zabol is less than most of the cities of Iran. In Birjand during year 2009, none of the thalassemia patients had positive HCV Ab (15).

In this study we also found less prevalence of HCV infection in thalassemia patients after the screening program.

The screening of blood products in Iran started in 1996 and has lowered HCV infection among thalassemia patients (16). In India screening started in 2001 and lowered HCV infection in thalassemia patients as well (17, 18). In this study we detected that the screening program markedly reduced HCV transmission. Most of the studies showed that prevalence of HCV infection in thalassemia patients decreased after screening (8, 12, 15, 19, 20). However, one study in Babol-Iran reported no significant difference in HCV infection prevalence in patients that received blood before and after 1996. Samples in this study were patients aged 7 to 18 years, who were referred to one hospital and needed blood testing (21).

It seems that evaluation of blood donors regarding transmissible diseases like HCV, has been very successful in Iran. Preservation of screening and development and update of its laboratory methods seems to be the sole beneficial decision.

#### Footnotes

**Conflict of Interest:** None to declare.

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#### References

1. El-Beshlawy A, Youssry I. Prevention of hemoglobinopathies in Egypt. *Hemoglobin*. 2009;**33**(sup1):14–20.
2. Vento S, Cainelli F, Cesario F. Infections and thalassaemia. *Lancet Infect Dis*. 2006;**6**(4):226–33. doi: [10.1016/S1473-3099\(06\)70437-6](https://doi.org/10.1016/S1473-3099(06)70437-6). [PubMed: [16554247](https://pubmed.ncbi.nlm.nih.gov/16554247/)].
3. Alavian SM. Hepatitis C infection in Iran; A review article. *Arch Clin Infect Dis*. 2009;**4**(1):47–59.
4. Brown RJ, Gaglio PJ. Scope of worldwide hepatitis C problem. *Liver Transpl*. 2003;**9**(11):S10–3. doi: [10.1053/jlts.2003.50244](https://doi.org/10.1053/jlts.2003.50244). [PubMed: [14586889](https://pubmed.ncbi.nlm.nih.gov/14586889/)].
5. Angelucci E, Pilo F. Treatment of hepatitis C in patients with thalassemia. *Haematologica*. 2008;**93**(8):1121–3. doi: [10.3324/haematol.13500](https://doi.org/10.3324/haematol.13500). [PubMed: [18669974](https://pubmed.ncbi.nlm.nih.gov/18669974/)].
6. Ataei B, Hashemipour M, Kassaian N, Hassannejad R, Nokhodian Z, Adibi P. Prevalence of anti HCV infection in patients with Beta-thalassemia in isfahan-iran. *Int J Prev Med*. 2012;**3**(Suppl 1):S118–23. [PubMed: [22826753](https://pubmed.ncbi.nlm.nih.gov/22826753/)].
7. Mohammad Alizadeh AH, Rezazadeh M, Ranjbar M, Fallahian F, Hadjilooi M, Mousavi M, et al. Frequencies of hepatitis B and C infections in hemophiliacs. 2006
8. Assarehzadegan MA, Ghafourian Boroujerdnia M, Zandian K. Prevalence of hepatitis B and C infections and HCV genotypes among haemophilia patients in ahvaz, southwest iran. *Iran Red Crescent Med J*. 2012;**14**(8):470–4. [PubMed: [23105982](https://pubmed.ncbi.nlm.nih.gov/23105982/)].
9. Mahdavian F, Saremi S, Rafiei M. Prevalence of hepatitis B, C and HIV infection in thalassemic and hemophilic patients of Markazi province in 2004. 2008
10. Hariri M, Akbari N, Yavari F, Javadi E, Javer SH, editors. Prevalence of hepatitis B, C and HIV markers in thalassemic and haemophilic patients in Isfahan, Iran, 2004. *Vox Sanguinis*. 2008; Wiley-blackwell; p. 268.

11. Bozorgi SH, Ramezani H, Vahid T, Mostajeri A, Kargar FH, Rezaei M, et al. The prevalence and risk factors of hepatitis C virus infection among thalassemic patients of Qazvin (2005). 2008
12. Kashanchi LM, Abdolrahim PH. Prevalence of HCV among thalassemia patients in Shahid Bahonar Hospital, Karaj. 2011
13. Najafi N, Baba M. A study on the Prevalence of chronic Hepatitis C in HCV-Ab positive patients referring to Gaemshahr Razi Hospital clinics in 1998. 2001
14. Boroujerdnia M, Zadegan M, Zandian K, Rodan M. Prevalence of hepatitis-C virus (HCV) among thalassemia patients in Khuzestan Province, Southwest Iran. *Pak J Med Sci Q*. 2009;25:113-7.
15. Azarkar Z, Sharifzadeh G, Chahkandi T, Mahmoudi Rad A, Sandoughi M, Rezaiee N. Survey of HBV and HCV markers in haemodialysis and thalassemia, South Khorasan, Birjand 2007. *Sci J Iran Blood Transfus Organ*. 2009;6(3):233-7.
16. Ansar MM, Kooloobandi A. Prevalence of hepatitis C virus infection in thalassemia and haemodialysis patients in north Iran-Rasht. *J Viral Hepat*. 2002;9(5):390-2. [PubMed: 12225335].
17. Mishra D, Pensi T. Transfusion associated hepatitis C in multiply transfused thalassemic children. *Indian Pediatr*. 2004;41(3):287-8. [PubMed: 15064522].
18. Marwaha RK, Bansal D, Sharma S, Kumar S, Trehan A, Duseja A, et al. Seroprevalence of hepatitis C and B virus in multiply transfused beta-thalassems: results from a thalassemic day care unit in north India. *Vox Sang*. 2003;85(2):119-20. [PubMed: 12925166].
19. Jafroodi M, Davoudi-Kiakalayeh A, Mohtasham-Amiri Z, Pourfathollah AA, Haghbin A. Trend in Prevalence of Hepatitis C Virus Infection among beta-thalassemia Major Patients: 10 Years of Experience in Iran. *Int J Prev Med*. 2015;6:89. doi: 10.4103/2008-7802.164832. [PubMed: 26445636].
20. Valizadeh N, Noroozi M, Hejazi S, Nateghi S, Hashemi A. Seroprevalence of Hepatitis B, Hepatitis C and Human Immunodeficiency Viruses among Thalassemia Patients in West North of Iran. *Iran J Ped Hematol Oncol*. 2015;5(3):145-8. [PubMed: 26705453].
21. Esmaeili MR, Mostafazadeh A, Sharbatdarn M, Hajiahmadi M, Alijanpoor M. Hepatitis C in blood products receivers. *Iranian J Pediat*. 2004;14(1):15-20.