Published online 2015 September 10. **Research Article**

Investigating epidemiologic status of thalassemic patients in Hormozgan province in 2011

Najmeh Niroomand Moradinejhad [1], Mahshid Sarafraz [2,*], Majid Sarneyzadeh [1], Asiyeh Pormehr-Yabandeh [3], Susan Hamedi [1]

[1] Mother and Child Welfare Research Center, Hormozgan University of Medical Science ,Bandar Abbas ,Iran.
[2] Student Research Committee, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.
[3] Mother and Child Welfare Research Center, Instructor of Department of Midwifery ,Hormozgan University of Medical Science ,Bandar Abbas ,Iran.

**Corresponding author*: Mahshid Sarafraz, BSc , Student Research Committee, Hormozgan University of Medical Sciences, Bandar Abbas, Iran; Mahshid.sarafraz@gmail.com; Tel: +98-9176580320.

Abstract

Background: Iran is a country located on the thalassemic belt of the globe. Investigating such issues is of a greater significance in southern provinces of the country where the high prevalence of thalassemia has imposed high costs and mental pressure on families and the healthcare system.
Methods: In this cross-sectional study conducted in 2011 as a census, the data related to patients or disease carriers were gathered from the Center of Special Diseases in Bandar Abbas Shahid Mohammadi Hospital which is a visiting center of many thalassemic patients in Hormozgan. The instrument used was a checklist. SPSS 16 was used to analyze the data with the help of descriptive and inferential statistics.
Results: In this study, the medical records of 650 patients were examined. The most of them were afflicted with major thalassemia (60.4%, 393 subjects) and the least number were afflicted with sickle cell thalassemia (0.9%, 6 subjects). The highest number of patients belonged respectively to Bandar Abbas (69%, 449 subjects), while the lowest number was that of Jask town (0.5%, 3 subjects). Also statistics showed that the highest number of patients were those whose parents had no prior family relationship (46.3%, 302 subjects).
Conclusions: It seems that the prevention rate of this disease has been low in this province. The instructions essential for birth control has not been provided for families. This requires great care and attention on the side of the authorities in charge.

Keywords: Sickle cell thalassemia; Major thalassemia; Bandar Abbas

Introduction

Thalassemia is a hereditary disease transmitted from carrier parents to infants and therefore afflicts many children all over the world especially in the thalassemia belt (1). Iran is considered as a country located in the thalassemic belt (2). Thalassemia is the most prevalent hereditary disease in Iran (3). Clinically speaking, this disease is of three types: 1- The severe type which is dependent on blood transfusion (major type), 2- Carriers without any evident symptoms (minor) and 3- States of moderate severity (intermediate). Major thalassemic patients are dependent on blood transfusion. Many of them require spleen removal (splenectomy) (4). Treating severe types of thalassemia is made possible through blood transfusion or injection of iron chelators. In order to prevent blood transfusion reactions, the blood needs to have little or no leucocyte (5). This has caused different blood products to be used for transfusion. However, there still exists a threat of iron overload. Many 16-24 year-old patients afflicted with major thalassemia die due to the consequences of iron overload. Almost all mortalities caused by iron overload occur due to iron accumulation in the cardiac muscle. Therefore, iron overload is a serious problem that faces thalassemic patients (6, 7). Due to the significance of this disease and the high costs and mental pressures it imposes on families and the healthcare system, it seems to be necessary to carefully examine the epidemiologic status of thalassemia in this country (8). It can help healthcare decision makers to better plan for preventing this disease or supporting the patients (9). Since there is a lack of research with this respect in Iran, and since there has been in fact no research on this issue in Hormozgan within the past recent years, the present researchers attempted to look into the epidemiologic status of thalassemic patients in Hormozgan province in 2011. As Hormozgan is a deprived province in Iran and people have a low level of education and awareness of how to prevent many diseases including thalassemia, conducting this research seemed to be essential to

Published online 2015 September 10. **Research Article**

examine the epidemiologic status of this disease in this province.

Table 1. The complete evaluated characteristics of patients

Variables		n(%)
Birth place		
	Bandar Abbas	449 (69%)
	Minab	72 (11%)
	Roodan	31 (4.8%)
	Hajiabad	17 (2.6%)
	Qeshm	16 (2.5%)
	Jask	3 (0.5%)
	Others	26 (9.6%)
Types of insurance		
	Special insurance	371 (57.7%)
	Armed forces insurance	43 (6.3%)
	Social supplies insurance	20 (3%)
	Medical services insurance	16 (2.4%)
	Rural insurance	13 (1.9%)
	Supported by the charity	2 (0.2%)
	Others	184 (28.5%)
Patient's blood type		
	A+	144 (22.2%)
	A-	9 (1.4%)
	O+	255 (39.1%)
	O-	20 (3.1%)
	B+	179 (27.5%)
	B-	13 (2%)
	AB+	28 (4.3%)
	AB-	2 (0.31%)
Father's Job		
	Worker	128 (19.5%)
	Clerk	116 (17.7%)
	Freelance	109 (16.6%)
	Managers	2 (0.3%)
	Unemployed	49 (7.5%)
	Deceased	59 (9%)
Educational level		
	Lower than diploma	418 (64.2%)
	Illiterate	154 (23.7%)
	Diploma	68 (10.4%)
	B.A./B.S.	7 (1.1%)
	Associate degree	4 (0.6%)
Splenectomy		
	Yes	159 (24.4%)
	No	491 (75.6%)

Methods

In this cross-sectional study which was conducted in 2011, the data related to patients or disease carriers were gathered from the Center of Special Diseases in Bandar Abbas Shahid Mohammadi Hospital which is a visiting center of many thalassemic patients in Hormozgan. These data were gathered from the current forms recorded in the computer system of Shahid Mohammadi's hospital of special diseases. Once faced with unrecorded data (old patients), we referred to their medical files and extracted their information. We included all of the patients hospitalized in 2011. No sampling was conducted in this research since the whole research population consisting of 650 patients participated. The instrumentation was a checklist which contained general information including patient's age, gender, birth place, parents' relation, contraceptive method, educational level, type of disease, insurance type and test results (blood type and type of blood received) and splenectomy. Records with incomplete data were excluded from the survey and all personal information were kept confidential and those records which we were not allowed to review or participate in the study, were excluded. In order to analyze the data, SPSS 16 was used which employed descriptive as well as inferential statistical procedures.

Results

In this study, the medical files of 650 patients and carriers of thalassemia were examined. They included 339 women (52.2%) and 311 men (47.8%). Among this population, 99.5% (648 individuals) were Iranian and 0.5% (2 subjects) were not Iranian. The majority of patients suffered from major thalassemia (60.4%, 393 subjects), followed by 23.3% of intermediate thalassemia (151 subjects) and 10.2% of minor type (66 patients). The lowest frequency belonged to the sickle type (0.9%, 6 patients) and finally the disease type of 5.2% (34 patients) was not identified. The highest number of patients were students (72%, 469 patients). However, 22.7% were children (148 patients). A few of them had experienced the chance of surviving till young adulthood and studied at university (2.8%, 18 subjects). The other participants were in other statuses (2.5%, 15 patients). Table 1 shows the complete evaluated characteristics of patients.

More than 75% of patients and disease carriers aged between 11 and 30. More than 90% of them were younger than 30 years of age and their average age was 19.9 years. Table 3 indicates the complete information about the ages of participants.

As shown in table 2, in terms of contraceptive method, the majority of mothers who had a thalassemic child used no specific contraceptive method (19.4%, 127

Published online 2015 September 10. **Research Article**

subjects). The least number of contraceptive methods were used during breastfeeding (0.2%, 1 subject) and 166 subjects (26.1%) used miscellaneous contraceptive methods.

Table 2. The frequency of contraceptive methods

Mother's contraceptive method	N.	%
Condom	24	3.7
Menopause	54	8.2
TL	78	11.9
OCP	109	16.6
Injection	29	4.4
DMPA	6	0.9
IUD	13	2
TL	1	0.2
ID	15	2.3
Pregnancy	4	0.6
Breastfeeding	1	0.2
Intention of pregnancy	4	0.6
None	127	19.4
Widow	19	2.9
Others	166	26.1
Total	650	100

Contrary to the dominant thought, the majority of these subjects did not have a history of this disease in their family (46.3%, 302 subjects). Other distant family relationships included: close relative (19.7%, 128 subjects), uncle (11.4%, 74 subjects), uncle and aunt (10.8%, 70 subjects), aunt or distant relatives (5.9%, 38 subjects).

Only 16.1% (105 subjects) had a history of other diseases while 83.9% (545 subjects) had experienced no other diseases. The types of blood received by these patients were filtered (62.5%, 545 subjects), pure blood (22.6%, 147 subjects), complete blood (9.7%, 63 subjects), washed blood (2.5%, 15 subjects), Paxil (2.2%, 14 subjects) and filter washed blood (.6%, 4 subjects), respectively.

Further analysis demonstrated that, there was a statistically significant relationship between smoking and diabetes in myocardial infarction patients (*P* value= 0.002). In addition, majority of diabetic subjects in this experiment, experienced the previous heart disorders (*P* value= 0.013). However, no considerable differences were diagnosed in the prevalence of diabetes between single and married patients. On the other hand, although the prevalence of diabetes was higher in workers and unemployed cases, no significant correlation was observed in relation to the employment of patients.

Table 3. The complete information about the ages of participants

Age	N.	%
Below 6	16	2.5
6-10	84	12.9
11-15	112	17.2
16-20	129	19.8
21-25	141	21.7
26-30	108	16.6
31-35	38	5.8
36-40	10	1.8
41-45	9	1.4
46-50	2	0.3
Above 51	1	0.2
Total	650	100

Discussion

This study was conducted on 650 patients afflicted with thalassemia in Hormozgan. The results obtained in this research revealed that awareness of thalassemia is essential in this province. The findings showed that in the terms of patient's educational level, the highest frequency belonged to those who had a degree lower than diploma (64.2%). This result is close to the findings of two similar studies conducted by Ansar et al and Abolghasemi et al in Iran (10, 11). The highest frequency and prevalence in this province was in Bandar Abbas (69%, 449 subjects), while the lowest frequency belonged to Jask (0.5%, 3 subjects). This is relatively in agree with the populations of the cities. Indeed, the

Published online 2015 September 10. **Research Article**

bigger and more crowded societies, experienced more prevalence of thalassemia (12).

In terms of spleen removal, 24.4% (159 subjects) were found to have had this surgery. These findings are to some degree similar to those obtained by Ansary & Tabatabaee in Dastgheib Hospital of Shiraz. In that study, among the 806 thalassemic subjects, 28.7% of subjects had experienced this surgery (13). In terms of the blood received, the most frequent blood type was filtered blood (62.5%, 406 subjects). The lowest frequency belonged to filter washed blood (.6%, 4 subjects). These findings were similar to those obtained by Ansary & Tabatabaee in their another research in Shiraz in 2005 (14).

The body of research conducted in this province indicated that the blood type O+ had the highest frequency (39.1%, 255 subjects) while blood type AB- had the lowest frequency (0.31%, 2 subjects). These findings were contrary to study conducted by Jahanara in the same province in 1994 which found a wider distribution of B+ among thalassemic patients than the normal population (10). However, the newer observations in this regards revealed that the blood type O+ is the major type of blood groups in most of the Iranian populations (15, 16).

Contrary to public beliefs, statistics showed that the highest number of patients had no history of this disease in their family (46.3%, 302 subjects). This is mainly in contrast with the literature. Majority of the authors declared that the disease can be observed in the families of the patients afflicted with thalassemia in Hormozgan. On the other hand, some other investigations described the adverse results as seen in our study (11, 17-19).

The present research revealed that a great part of thalassemic patients are afflicted with the major type of this disease. Therefore, it seems that preventive attempts for thalassemia are limited in this province and may be the necessary instructions on birth control were not adequately provided for families. It is possible that various ethnic beliefs influence the occurrence of these cases. It requires precise practical planning to prevent such diseases. These attempts require more attention on the part of the authorities in charge.

Acknowledgements

Finally it is worthy to respect of Mr.Iman Tahamtan the faculty member of Hormozgan University of Medical Science, who help us caring out this research.

Conflict of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writings of this article.

References

1. Greer JP FJ, Rodgers GM, Paraskevas F, Glader B, Arber DA. Wintrobe's Clinical Hematology. Greer JP, editor: Lippincott Williams & Wilkins; 1990. 1083-132 p.
2. Mirbehbahani N BN, Akhavanmahdavi A. Effect of spelenectomy on need of transfusion in b-thalassemic patients. Journal of medicine science. 2005;7(4):7.
3. Najmabadi H K-NR, Sahebjam S, Pourfarzad F, Teimourian S, Sahebjam F, Amirizadeh N, Karimi-Nejad MH. The beta-thalassemia mutation spectrum in the Iranian population. Journal of Hemoglobin. 2001;25(3):11.
4. Zarina AL HA, Zulkifli SZ, Jamal R. POST-SPLENECTOMY SEPSIS IN THALASSEMIC PATIENTS. SOUTHEAST ASIAN J TROP MED PUBLIC HEALTH. 2005;36(2):3.
5. Rehiminejad M.S FH. Survery of leukodepletion and HCT decrease in washed packed cells. Shiraz: Shiraz University of Medical science; 2001.
6. Wintrobe's Clinical Haematology. British Journal of Haematology. 1999;105:1.
7. Rachmilewitz E, Shinar E, Shalev O, Galili U, Schrier S. Erythrocyte membrane alterations in beta-thalassaemia. Clinics in haematology. 1985;14(1):163-82.
8. Shmueli A, Messika D, Zmora I, Oberman B. Health care costs during the last 12 months of life in Israel: estimation and implications for risk-adjustment. International journal of health care finance and economics. 2010;10(3):257-73.
9. Weatherall D. Thalassemia as a global health problem: recent progress toward its control in the developing countries. Annals of the New York Academy of Sciences. 2010;1202(1):17-23.
10. Ansar M, Kooloobandi A. Prevalence of hepatitis C virus infection in thalassemia and haemodialysis patients in north Iran-Rasht. Journal of viral hepatitis. 2002;9(5):390-2.
11. Abolghasemi H, Amid A, Zeinali S, Radfar MH, Eshghi P, Rahiminejad MS, et al. Thalassemia in Iran: epidemiology, prevention, and management. Journal of Pediatric Hematology/Oncology. 2007;29(4):233-8.
12. Nedaei M. Wind resource assessment in Hormozgan province in Iran. International Journal of Sustainable Energy. 2014;33(3):650-94.
13. Ansari H TH. Factors associated with complications in patients with thalassemia major patients in Shiraz. Journal of Sabzevar School of Medical Sciences. 2007;14(1):10.

Published online 2015 September 10. **Research Article**

14. Ansari H TS. Assessment of survival without cardiac disease of thalassemic patients of Shiraz. 2005(1):10.

15. Mohammadali F, Pourfathollah A. Association of ABO and Rh Blood Groups to Blood-Borne Infections among Blood Donors in Tehran-Iran. Iranian journal of public health. 2014;43(7):981.
16. Amin M, Gholamhossein T, Majid N, Marziyeh H, Narges S, Akbar D, et al. Prevalence of alloimmunization against RBC antigens in thalassemia major patients in South East of Iran. J Blood Disorders Transf. 2013;4(147):2.
17. Tadmouri GO, Başak AN. β-Thalassemia in Turkey: a review of the clinical, epidemiological, molecular, and evolutionary aspects. Hemoglobin. 2001;25(2):227-39.
18. Delea TE, Edelsberg J, Sofrygin O, Thomas SK, Baladi JF, Phatak PD, et al. Consequences and costs of noncompliance with iron chelation therapy in patients with transfusion-dependent thalassemia: a literature review. Transfusion. 2007;47(10):1919-29.