The Prevalence of Thalassemia and Types of Anemia in Couples with Suspected Types of Blood Dyscrasia Attending Health Center 5 in Bandar Abbas for Premarital Blood Tests

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ABSTRACT: Introduction: Thalassemia is the most common blood dyscrasia in the world; the disease is more common in Iran, especially in coastal areas, it has an autosomal recessive pattern of inheritance and thus preventing the birth of infants with thalassemia major requires premarital blood tests. Materials and methods: This cross-sectional study was conducted on all couples with suspected types of blood dyscrasia (thalassemia and other blood disorders), in which demographic variables of blood dyscrasia were also investigated, including α-β, IDα-β, IDα-α, and α-S. Findings: In this study, 12030 people (6015 couples) participated, among them 9273 people (77.08%) were city dwellers and the rest were from rural areas, 3004 couples (49.94%) had consanguineous marriages and the highest prevalence of blood dyscrasia was related to α-αIDA with the prevalence of 861 (7.15%). Conclusion: The results show that the prevention of the birth of infants with thalassemia is the best solution, as high costs are needed for the treatment of these patients.

Keywords: Thalassemia, Prevention, Awareness, Premarital Counseling, Iran, Blood

INTRODUCTION

Thalassemia is the most common blood disorder in the world (1). The disease is most prevalent in northern and southern Iran (2). According to thalassemia statistics, Hormozgan is in the first ranks and has a high prevalence (3).

According to clinical symptoms, there are four types of thalassemia in the world, thalassemia minima (silent carrier), thalassemia minor (clear carrier), thalassemia intermedia and thalassemia major; there is no clinical and laboratory symptoms in thalassemia minima and it is difficult to distinguish it from healthy people (4).

Beta-thalassemia major is a severe and fatal anemia and it is easily diagnosed from patient’s clinical symptoms. It has an autosomal recessive pattern of inheritance and in each pregnancy resulting from married couples who are carriers of the trait, there is a 25 percent probability that their infant will be born with thalassemia major. The disease is apparent from the first years of the life and peripheral blood smear, CBC, with relatively simple laboratory symptoms is sufficient for diagnosis (4, 5).

For normal growth and sustaining a healthy life, the patients need repeated blood transfusions as the most common treatment around the world, including Iran. Repeated blood transfusion will increase iron intake and its precipitation in sensitive organs of the body such as the liver, glands and heart create complications such as liver cirrhosis, heart disorders, diabetes, hypothyroidism, hypoparathyroidism and hypogonadism (6). Presentations of beta-thalassemia major due to chronic hemolytic anemia accompanied by decreased hemoglobin and blood transfusion dependent at 6 months age is associated with enlargement of organs such as the spleen, failure to thrive and bone deformities (7).

The determination of beta-thalassemia minor needs specialized tests due to the lack of specific clinical symptoms. Beta thalassemia minor, unlike thalassemia major, usually does not require specific treatment, but early diagnosis and screening is of special importance, particularly for premarital genetic counseling, to prevent the marriage of people with thalassemia minor and therefore the birth of infants with beta thalassemia major.
Early diagnosis of beta-thalassemia minor is usually based on hypochromic microcytic image of peripheral blood and a complete blood count. Those with less than 80 femtoliters are considered as MCV in early diagnosis. However, as some other types of hypochromic microcytic anemia, particularly iron-deficiency anemia, create an image like thalassemia minor, it is important to differentiate them from each other. Final diagnosis of beta thalassemia minor is usually based on the measurement of HbA2. If the hypochromic microcytic image of peripheral blood level of HbA2 is more than 3.5%, it is considered as beta-thalassemia minor (8, 9).

Prevention of the birth of infants with thalassemia is the best solution, as high costs are needed for the treatment of these patients, which is very difficult for families and society as well (7).

Due to high costs and risks of thalassemia, this study aimed to reduce its prevalence in Hormozgan with providing proper training for couples with suspected types of blood dyscrasia attending health center for premarital blood test, as the disease can be diagnosed nowadays by appropriate scientific methods and premarital blood test, and therefore the birth of infants with thalassemia can be prevented.

MATERIALS AND METHODS

This research was a cross-sectional study. The statistical population consisted of all couples with suspected types of blood dyscrasia (thalassemia and other blood disorders) who attended health center 5 in Bandar Abbas for premarital blood test from January 2009 to March 2009. Participants were selected through census.

In this study, the medical cases of all couples suspected with type of blood dyscrasia (thalassemia and other blood disorders) were evaluated, which were confirmed by a physician through the results of blood tests. One confounding factor in this study was the accuracy of laboratory equipment for the diagnosis of dyscrasia (thalassemia and other blood disorders). The types of blood dyscrasia of all couples studies in this research included the following suspected cases:
- alpha thalassemia and α-thalassaemia (α - α)
- α-thalassemia and β-thalassemia (α - β)
- Sickle cell anemia and alpha-thalassemia (α - Sα)
- α-thalassemia and iron deficiency (IDA - α)
- β-thalassemia and α-thalassemia and iron deficiency (IDα - β)
- Suspected between α-thalassemia and iron deficiency (IDα - IDα)

Inclusion criteria for this study included couples who were suspected with one of the types of blood dyscrasia (thalassemia and other blood disorders) and also aged between 15 and 70 years old, and exclusion criteria included medical cases with incomplete data.

Variables included: place of residence, education, α - β, IDα - IDa, IDα - β, IDα - α, α - S and α - α. A checklist was used which included demographic characteristics such as age, place of residence and the type of dyscrasia examined in this study including α - β, IDa - β, IDα - α, α - S and α - α.

Data were analyzed by SPSS. In addition, the paired t-test was used to compare quantitative variables and chi-square test was used to assess the relationship between qualitative variables. In this study, the information contained in the medical cases of all couples was kept confidential.

Findings

In this study, 12030 people (6015 couples) participated, among them 9273 people (77.08%) were city dwellers and the rest were from rural areas, 3004 couples (49.94%) had consanguineous marriages, the minimum (maximum) age of marriage for women was 13 (30) years old and the age of marriage for men ranged between 16 – 30 years old.

The most common blood dyscrasias identified in participating couples are given in Table 1.

<table>
<thead>
<tr>
<th>Blood dyscrasia</th>
<th>Number (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-β</td>
<td>167 (1.38%)</td>
</tr>
<tr>
<td>α-α</td>
<td>242 (2.01%)</td>
</tr>
<tr>
<td>α-αIDA</td>
<td>861 (7.15%)</td>
</tr>
<tr>
<td>β-αIDA</td>
<td>128 (1.06%)</td>
</tr>
<tr>
<td>α - S</td>
<td>5 (0.04%)</td>
</tr>
<tr>
<td>Healthy couples and other blood dyscrasias</td>
<td>10627 (87.82%)</td>
</tr>
</tbody>
</table>

DISCUSSION AND CONCLUSION

In this study, 77.08% of people attending the health center were city dwellers and 49.94% of them had consanguineous marriage; while in the study conducted by Jaafari, 57.8% of participants were city dwellers and 39.4% had consanguineous marriage (10).
In this study, α-thalassemia (α-thalassemia major) was the most common blood dyscrasia (n= 861, 7.15%), which in fact shows that the most of carriers had alpha thalassemia. In the study conducted by Valizadeh et al. the rate of alpha thalassemia carriers (8.5%) was more than beta thalassemia (5.5%) (11).

Hosseini et al. in their study showed that some major factors in reducing the birth rate of infants with beta thalassemia major include providing training about thalassemia to volunteers for marriage and continuous post-marriage care for carrier couples, and also specific counseling about thalassemia to these couples and their insurance (12).

According to the study of Beshkar et al., despite a significant reduction in the number of patients after thalassemia screening and given the importance of this disease, there are important factors for making zero the birth of infants with thalassemia, including accurate counseling, identification of couples who have not been screened, making available facilities for medical tests before birth, financial assistance, or full commitment of insurance to pay the costs of tests, and put deprived people under insurance coverage by the government, and also the screening at younger ages (13).

According to the results, prevention of the birth of infants with thalassemia is the best solution, as high costs are needed for the treatment of these patients, which is very difficult for families and society as well. Therefore, to prevent the prevalence of thalassemia, the authorities should be aware of using appropriate training and counseling methods for couples suspected with types of blood dyscrasia attending the health center for premarital blood tests.

On the other hand, in this study all people were tested after they were interested in each other. However, it is better to build culture on this field and to make all people aware of their blood status even before the age of marriage and to provide necessary training to families to be aware the complications and consequences of the marriage of two people with thalassemia minor. It is also a good idea that people blood information is recorded in a database in health centers and the marriage of people with thalassemia minor is prevented as much as possible.

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REFERENCES


