

## Frequency of Thalassemia in Iran and Khorasan Razavi

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### **Abstract**

#### **Introduction:**

Beta-thalassemia is the most common hereditary disease in Iran. More than two million carriers of beta-thalassemia live in Iran. Since the Iranian population is a mixture of different ethnic groups, it is necessary to determine the frequency in the different parts of the country.

#### **Materials and Methods:**

This descriptive study is a cross sectional study with helping by professional groups fighting diseases in Khorasan Razavi province.

#### **Results:**

In Iran, according to World Health Organization, about 4 percent of the population, are carriers of the thalassemia gene. In other words, about 2-3 million people are suffering from thalassemia minor. Now, more than 18 thousand cases of thalassemia are scattered across the country in different provinces, are different. Mazandaran, Gilan, Hormozgan, Khuzestan, Kohgiluyeh, Fars, Bushehr, Sistan and Baluchestan, Kerman and Isfahan, are 10 provinces with high prevalence in our country. We have 342 cases of thalassemia major in Khorasan Razavi province.

#### **Conclusion:**

Prevalence of thalassemia in our country is 3.6% and Iran is located on the belt of thalassemia and due to a history of consanguinity, this disease has a prevalence of 0.6% among in the provinces of Khorasan Razavi.

#### **Keywords:**

Belt Thalassemia , Khorasan Razavi, Thalassemia, Prevalence, Iran.

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## Introduction

Thalassemia is a Greek word that the word "Thalassa" meaning the sea and "Emia" means the blood and Mediterranean anemia or Cooley's anemia and in Persian it is called anemia. Thalassemia is a hemolytic disease Congenital the law Mendel inherited. First time an American scientist named Dr. "Roma" in 1925 it was recognized and introduced to others. This disease as severe (major) and (minor) appears. If both parents have the defective gene have a severe case of the major and if only one parent the defective gene has the minor appears. For those who have thalassemia minor type, will not cause problems and they can live like normal people and just be very vigilant in marriage. But contrary to this condition, the maximum harm to their patients the kind of major leads.

Among the eastern Mediterranean region, Iran is one of the major centers for the prevalence of  $\beta$ -Thalassemia. Regarding to high consanguinity among population, it is estimated that there are between two and three million  $\beta$ -Thalassemia carriers and 25,000 patients in Iran. Like many other countries in the region, a large number of Thalassemia patients are  $\beta$ -Thalassemia. Alpha Thalassemia is not as prevalent as  $\beta$ -Thalassemia in Iran (1-2).

Thalassemia is the most widespread recessive disease worldwide. Beta-thalassemia is characterized by the deficiency or absence of beta globin production. The condition is clinically mild in the healthy carrier that can be easily detected through routine blood testing, but intermediate or severe in the patients who are born with 25 % chance at each pregnancy from parents who are both healthy carriers (3-4).

Thalassemia carriers are today present worldwide with high frequencies mainly in the endemic countries of Africa, the Middle East, the Indian subcontinent, Southeast Asia, and the Mediterranean region (5-7). Thalassemia is a common disease in Iran

with higher frequencies in the north and south parts of the country (8-10).

Thalassemia major leads to serious medical, social, and economic problems for patients and their families, and patient's care represents a considerable financial burden for the public health budget (11-12). After a 5-year pilot screening, the Iranian Ministry of Health approved in 1996 a mandatory national screening protocol for premarital testing. This program included a laboratory strategy to identify and counsel couples at risk providing support and care (9,13).

Previous studies have estimated the prevalence of the  $\beta$ -thalassemia trait in Iran above 10 % around the Caspian Sea and the Persian Gulf, and about 4–8 % in other areas (14).

Overall, in a report of the Iranian Ministry's of health from 2008, the average frequency of  $\beta$ -thalassemia trait for the whole of the country has been estimated to be 3.6 % (15). This would mean that without premarital screening the national birth prevalence would be at least 1,300 affected newborns per year (15). On the other hand, due to the high rate of consanguineous marriages in the Iranian population (30–80 %), predicting the prevalence for beta-thalassemia trait in Iran becomes more complex.

At the other countries, this disease in over 60 countries have been reported, and about four fifths of the world where 250 million people carry the gene for it. Thalassemia in almost all races are seen, but areas with high incidence (Belt-thalassemia) in the Mediterranean region (Italy, Spain, Portugal, Greece, parts of Russia and Cyprus), North and West Africa, the Middle East (Saudi Arabia, Iran, Turkey and Syria), the Indian subcontinent (India and Pakistan), Southeast Asian countries (Bangladesh, Indonesia, Thailand, Malaysia and southern China) South American region. More than 80 percent of patients with hemoglobin disorders live in developing countries and Unfortunately they are still a considerable

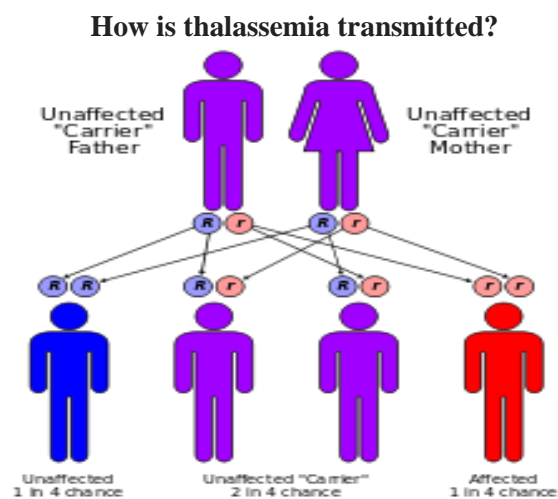
number of sick children in these countries die before the diagnosis.

Thalassemia is seen in almost all races, But areas with high prevalence (thalassemia belt) areas of the Mediterranean countries (Italy, Spain, Portugal, Greece, parts of Russia and Cyprus), North and West Africa, the Middle East (Saudi Arabia, Iran, Turkey and Syria), Countries of the Indian subcontinent (India and Pakistan) and Southeast Asian countries (Bangladesh, Indonesia, Thailand, Malaysia and southern China) and South American region. More than 80 percent of patients with hemoglobin disorders in developing countries live and unfortunately, still a considerable number of sick children in these countries die before the diagnosis. It should be noted that the migration of a people person and marry a person of another tribe, Thalassemia in almost all countries, including northern Europe or other countries that previously had thalassemia, frequency data(9-15).

This study was conducted to determine the prevalence of thalassemia in the country and Khorasan Razavi province to be determined hemoglobin disorders in the context of our country has to determine what rank in the world.

percent chance of developing any of their children with thalassemia major (severe anemia) have and 50 percent chance of thalassemia minor and 25% may be healthy. Signs and symptoms in patients with thalassemia major thalassemia creates the kind of (severe anemia) include: F abnormal hemoglobin called or fetal hemoglobin and increased red blood is reduced, a child who has the disease itself is anemic and this causes anemia, enlarged spleen and liver and can disguise his appearance.

Therefore, due to continuous low blood, the patient is forced to constantly make blood transfusions and the effect of blood transfusions that contain large amounts of iron and its effect on the disease breaks hemoglobin (red blood cells) and release of iron, Iron levels in blood and tissues of the body such as increased; heart, liver, spleen will precipitate and can cause other problems that can only help with injections of Desferal to prevent iron overload. Continuous use of deferoxamine with its high price, will cause economic hardship in families. So if a lack of knowledge or negligence, your family stepped thalassemia, is nowhere to escape(15).



**Fig 1:** Thalassemia has an autosomal recessive pattern of inheritance

If a husband and wife each have a type of anemia, mild (minor) have thalassemia, 25

**Thalassemia Disease**

Many diseases in humans, is caused by abnormalities in blood. RBC diseases, among the more common blood disorders. The most severe disease, thalassemia and sickle cell anemia is a type of anemia called that this is very common in Africa.

Alpha and beta thalassemia each include two types of thalassemia. Beta thalassemia include major and minor thalassemia. Forms of these diseases result in a special type called corpuscular hemoglobin is the protein. Hemoglobin damage, genetic abnormalities and increased transfers from parents to children. Thalassemia genes from one parent or both the child and the child is suffering from the disease. This inherited anemia (beta thalassemia) and impairment of performance due to defects in chromosome number 11 red blood cells are created. Alpha

thalassemia defect in chromosome number 16 has emerged as a result and disease-thalassemia is one or more of the 4 gene from alpha chain constructive, The disease is more severe than the number of genes is deleted and the number of deleted genes are divided into 4 groups: Hydrops fetalis: the removal of the four genes are alpha of hemoglobin is made up of only and gamma chains and Alpha thalassemia is the most serious type, Hemoglobin H: occurs the remove the third alpha-globin genes, Alpha thalassemia trait 1 : two alpha gene is deleted and is in every respect similar to beta-thalassemia minor, Alpha thalassemia trait 2: only one gene is of 4 genes, is deleted and a gene carrier, is silent and asymptomatic.

#### Some Problems in Thalassemia Patients Include

1. Physical weakness and low growth
2. Problems caused by blood transfusions and pain
3. Continuous infusion of deferoxamine (DESFERAL) and high cost
4. Skull deformity and abnormal growth and mental problems
5. Concerns of the patient's future (13-18).

#### Materials and Methods

This descriptive study is a method with the help of Cross Sectional and professional groups have been fighting diseases Khorasan Razavi province. The study population included all patients with thalassemia in the province. Because the study sample was identical to the census data has been collected. Data were entered and the spss software computer analysis were analyzed using descriptive statistics.

#### Results

Results show that: Thalassemia in Iran is unfortunate and Approximately thirty thousand people are infected and Each year the numbers are added to this. Thalassemia in the first few months will behide and Mothers see their children yellow, is weak and restless, And when you

take your child to the doctor, After the test, The doctor says to mother that her child is born with the disease. People who have thalassemia in Iran are divided into four groups. 1. People who have no access to medical facilities and are deprived of proper treatment of the blood transfusion and deferoxamine. 2. Patients whose disease is diagnosed early and are injected into the blood, but do not use the desferral and other therapeutic measures. 3. Those whose disease is diagnosed early, they have received the appropriate injection into the blood and life will be substantial. 4. That patients have access to bone marrow transplantation, the probability of their recovery is largely achieved. Department of Community Health Center in combating diseases, statistics, the number of couples covered by prevention programs for couples in 1032 declared, that most couples of carriers these cities were covered by counties 1. Torbat jam with 79 couples (both minor), The 47 children couples are diagnosed with thalassemia major. 2. Sarakhs with 70 covered couples, 33 of these couples with children are the major types, and 3. Neishabour with 52 pairs of covered couples by the 25 major types of their children, are affected.

#### In the city of Mashhad, respectively:

Mashhad 2 with 336 covered and 116 children with thalassemia major types. Mashhad 3 with 166 covered and 53 children with thalassemia major types. Mashhad 1 with 160 covered and 47 children with thalassemia major types. And overall Thalassemia prevalence is 0.6% in Khorasan province.



**Fig 2:** Khorasan Razavi province location on Iran's map

## Conclusions

Thalassemia is a rare and complex disease that took the lives of children before they reach the age of adolescence. Higher education families, inventing new technologies, improvements to the emergence of new methods in clinical and therapeutic measures, have a major impact on patient health and longevity in families. Also with regard to genetic tests before marriage and Embryo biopsy and amniotic fluid index, The number of sick natives, is declining. Thalassemia patients Yesterday, a child unable who lives less than 20 years experience, But today's young life that lives in search of work and juicy flavor, has different needs. Our country was on the thalassemia belt and due to family history marriage, this disease has a prevalence and Khorasan provinces with a prevalence of 0.6% is provinces with low common-thalassemia.

## The Prevention of Thalassemia Include

1. CBC blood test for anemia and hemoglobin A2.
2. During the first weeks of pregnancy tests on the fetus during pregnancy.
3. Genetic counseling in people who are classified under threat among those screening or people who have close relatives with.

Talasmystnd recommended Recurrence risk in next children a couple with child is 25%, If the mutation and confirmed that children with parents being carriers, can be detected before birth during pregnancy the fetus from infection can be sure.

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