

Thalassemia in Iraq Review Article

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Abstract:

Thalassemia major is quite prevalent in Iraq with about 15000 patients. Thalassemia is big health issue that have very big burden on health services. In Iraq 19 thalassemia center that reflects the importance of disease.

Premarital testing for thalassemia is of prime importance of awareness of couples about the risk of getting the disease to their offspring and the complications of the disease.

Education program is also important using mass media leaflets and posters about the importance of prevention of the disease

Key words: *Thalassemia Major, Iraq, Review article*

Introduction:

Thalassemias are group of disorders that results from impaired Haemoglobin production and defective erythropoiesis. For those with sever form of thalassemia. Lifelong blood transfusion is the mainstay of treatment. Children with sever thalassemia usually don't survive more than five years. While chronic blood transfusions and medical comprehensive care Life expectancy was expected to the fourth decade of life and more.(1).

The complications of a chronic blood transfusions are the prominence challenges in the management of thalassemia major. In patients with thalassemia major blood transfusions is usually started before the age of one year (2;3;4). Complications that are directly related to transfusions are included blood born infections and development of anti RBCs antibodies, febrile, allergic or delayed hemolytic reactions. The goal of blood transfusions is to maintain the Hemoglobin level at 9 to 10 gm /dL. Typically blood is usually given every three to four weeks to reach this target level of Hemoglobin.(5, 6).

Prevalence of thalassemia minor

The carriers of beta thalassemia minor are usually asymptomatic. Their hematological parameters are mostly mild hypochromic microcytic, Anemia High Hemoglobin A2 level with

normal or mildly elevated HbF level on Hb electrophoresis (7,8). In Baghdad the prevalence of beta thalassemia minor is 4.4 % as reported by Yahya in 1996 (9). In Mosul city in north of Iraq the estimated prevalence of beta thalassemia minor was 8.8 % as noticed in 2009 by Khaleel et.al(10). While in Basra at the South of Iraq 4.6% was identified by Hassan in 2003(11).in north east of Iraq, Sulaymaniyah 4.14%was seen by Jalal in 2008 (12).The prevalence rates of recessive disease like thalassemia may be influenced by cultural and demographic characteristics of a population studied. . In Iraq most marriage at young age. They have large family size with advanced maternal and paternal ages. The consanguineous marriage represents about 60 70% of marriage in Iraq(13)

Iron chelating therapy in Iraq

Deferasirox is an oral chelating drug that had FDA approved in Nov. 2005 in study. From Iraq published in 2017 by Abd where 50 patients with beta thalassemia major.about 70% of patients are good compliance and 30% of patients are poor compliance. .patients treated with deferasirox showed some gastrointestinal symptoms like abdominal cramps, vomiting and diarrhea in 12% of patients. While skin rashes in 2% and an increase in liver enzymes in 4%. The introduction of this oral chelating drug for school age patients in which the compliance is very big problem.The does 10-20 mg/kg/day. This drug could improve the survival of patients with thalassemia major.(14, 15,16,17,18)

Liver disease

The liver is the primary site for iron storage. Liver disease is

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major complications affected patients with beta thalassemia major. Liver damage could be due to deposition of excess iron on hepatocytes. Gallbladder stones is found in 30-80% of patients.(19,20). In case of iron overload free iron is toxic and catalyze with resultant of lipid peroxidation causing hepatotoxicity and liver fibrosis and cirrhosis and can develop hepatocellular carcinoma (21,22,). It has been estimated that about 20% of patients with thalassemia major patients had been infected with hepatitis C which cause liver damage liver fibrosis and cirrhosis with elevated liver enzymes. That can induce hepatocellular carcinoma. Also multiple blood transfusions can lead to infection with hepatitis B.(23)

Cardiac disease

The most important complications in patients with beta thalassemia major are cardiomyopathy and various types of arrhythmias. About 70% of deaths in patients with beta thalassemia major globally(24). In patients with beta thalassemia major if untreated anemia leads to increase cardiac output that results in left ventricular hyperatrophy end with heart failure (25). Iron overload will result in peroxidation and cellular injuries. As results of iron overload that cause left ventricular cardiomyopathy. Also cardiac arrhythmia like atrial fibrillation ventricular tachycardia and supraventricular tachycardia are increased according to increased cardiac siderosis (26). For proper evaluation of cardiac siderosis a non invasive method is MRI-T2 that also detect early ventricular dysfunction(27.).

Endocrine disorders

Life long blood transfusions leads to accumulation of excessive amount of iron in different types of organs that associated with early mortality. However, with the use of iron chelators the oral ones in the last decade. The survival rate of thalassemia major patients are greatly improved(34.). The endocrine complication became frequently more in a longer survival affecting quality of life (28).

Thyroid disorders is a well recognized endocrine complications after long time blood transfusions in thalassemia major patients(29, 30,31). In study published in 2016 from Baghdad where 73 patients with transfusions dependent thalassemia major undergoes thyroid function tests TSH, T3, and T4. The results revealed. 16 patients suffered from hypothyroidism with prevalence rate of 21.9%. All patients with hypothyroidism were subclinical hypothyroidism. No case was identified to have autoimmune thyroiditis.(32).

In conclusion thyroid dysfunction is highly prevalent among Iraqi patients with beta thalassemia major. Monitoring of those patients annually for replacement therapy and early detection.

A study from Duhok province at north of Iraq included (33) patients with beta thalassemia major showed that 23.6% of patients had subclinical hypothyroidism which was consistent with that reported in a study from Baghdad. Also in case of testosterone levels are significantly lower in patients(34). than

in control group. Close follow up for endocrine function are highly recommended for better quality of life.

Another study from Baghdad was published in 2017 included forty adults females. All female reproductive hormones were done. The results showed significant reduction in all hormones compared with the control group this could be attributed to iron overload in pituitary gland.(35.).

Molecular genetic study on beta thalassemia major

In study from Baghdad on (75) patients with beta thalassemia major that were diagnosed clinically and hematologically. Blood samples were taken from IbnAl Baladi pediatric center. Genomics DNA extraction were done for patients and control group from person with normal hematological parameters.

Polymerase chain reaction was used for amplify of four regions in beta globin gene. The results showed that IVS-1 nt110 are the most common in population studied. Codon 39 was also identifies one patient has compound mutation of IVS-1 nt 110 and CD8. Eighteen patients showed none of the four mutations seen. This study conducted in Baghdad in 2010.(36)

In study from Northeastern Iraq the most common mutation in the studied group is IVS-11-1(G>A) 47.2% followed by IVS-1-6(T>C) (23.3%), and IVS-1-110 (5%)(37). This difference between the two studies could be due to different ethnic groups also small samples taken. Further studies on large number of patients with thalassemia major from different population in Iraq is recommended.

Epidemiology of thalassemia in Iraq

In a retrospective study of records of patients from 2010 to 2015 through visiting of (16) out of (19) thalassemia centers in Iraq.

Thalassemia represents about (75%) of all haemoglobinopathies. The prevalence has been reported 32 / 100.000 population in 2010 had been increased to 36/100.000 of population in 2015. However, the incidence had been reduced from (36/100.000) live birth in 2010 to (34/100.000) live births in 2015.

Beta thalassemia major represented (67%) of all types of thalassemia.

The highest prevalence rate of thalassemia was reported in Basra (74/100.000) of population. Most of patients with age from 6 to 15 years that represents 42% and only (9.5%) their age 30 years and more.

The most important thing is about (75%) patients were consanguineous parents.

In conclusion the decrease incidence hundreds of new patients born every year. Health education and premarital screening tests for thalassemia carriers in the present time is regarded as the best preventive tools that have economic and social values.(38)

Preventive programme

In Iraq there is law for premarital tests. Included screening

tests for thalassemia for each couple before marriage. Using electronic counter for red blood indices like MCV and MCH. Those with low MCV and MCH will be for Hemoglobin electrophoresis for HbA2 estimation if high more than 3.6% will be diagnosed as beta thalassemia minor. If normal electrophoresis iron study status will be done. If normal iron status alpha thalassemia will be considered. If low iron stores iron deficiency will be considered.

Genetic counseling

In couple at risk were counseled together by specialist in hematological disorders also public health specialists to explain for both about the risk that their child will get the disease. Also to get full information about the sign and symptoms of the disease and full consequences and medical treatment and complications that will be expected. Also the option to get

separated or to have prenatal diagnosis. The decision is related to the couple at risk.

The couple should sign that they understood the risk of their possible offspring. The report sends to the court that testing for thalassemia done. This because of privacy for the couple.

For prenatal diagnosis of thalassemia in Iraq need legal frame for this time. Also it is costly and need well trained persons to perform this invasive method. (39)

Education program

In case of education program by using mass media leaflets and posters. Explain to the public the risk of getting the disease and the complications of this disease. The life long blood transfusions. The complications of iron overload, blood borne infection and shortening of survival and frequent hospitalization. (40)

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