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Thalassemia and Women's Health

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1. Introduction

Thalassemia is one of the most common genetic disorders caused by decreased synthesis of alpha or beta-globin chain subunits that subsequently leads to alpha/beta globin chain imbalance. The accumulation of free excessive alpha or beta globin chains and their products and deposition on red cells membrane are the causes of ineffective erythropoiesis and hemolytic anemia (1). The unsuccessful erythropoiesis, iron overload and chronic hemolytic anemia are the main complications of thalassemia. Alpha thalassemia which is mainly inherited by alpha globulin gene deletions is divided into four subtypes. These include silent carries, alpha thalassemia minor, HbH disease and hydrops fetalis. Beta-thalassemia is mostly inherited by beta globulin gene mutations and divided into three main sub-groups based on clinical severities. Patients with beta-thalassemia minor are largely asymptomatic and are characterized by mild anemia. These patients have a heterozygous beta-gene mutation. Clinically significant forms of beta-thalassemia include beta-Thalassemia Major (TM), that is severe hemolytic anemia resulting in transfusion dependency that demand medical attentions in the early years of life, the consequence of homozygous or compound heterozygous forms of beta-gene mutations. Beta-Thalassemia Intermedia (β-TI) is usually clinically milder than TM and leads to mild to severe hemolytic anemia (2, 3).

1.1. Thalassemia and Female Fertility

In thalassemia the increasing iron absorption due to chronic hemolytic anemia can cause iron overload and iron deposition in organs which results in serious iron-related organ complications like cardiac and endocrine dysfunctions including diabetic mellitus, hypoparathyroidism, hypogonadism and infertility (4, 5).

The iron overload in thalassemia can affect the development of male and female sexual organs, which have adverse effects on the reproductive capabilities of patients (6). Female patients with thalassemia may experience delayed puberty and some do not reach sexual maturity (hypogonadism) which is the result of excessive iron deposition in sexual glands, where it may lead to deficiency of hormones extraction necessary for sexual maturation in thalassemic patients.

In women, the inability of producing female sex hormones including estrogen, progesterone, Lutenizing Hormone (LH) and Follicle-Stimulating Hormone (FSH) results in lack of development of secondary sex characteristics. In other words, breast development does not progress, and menses often does not occur (amenorrhea), a condition which could lead to lack of ovulation in affected females. Other endocrine dysfunctions including diabetes and hypothyroidism as well as cardiac impairment, liver dysfunction and trans placental viral transmission may also complicate pregnancy in thalassemia (7, 8).

1.2. Women Health Management in Thalassemia

Transfusion and therapeutic advances in thalassemia, including the availability of new oral iron chelators and new non-invasive methods for early detection and treatment of iron overload, have significantly improved the life expectancy and quality of life in patients with thalassemia (9). These advances also improved the fertility potential and desire of these patients to have children.

A successful pregnancy in a woman with thalassemia major was first reported by Walker in 1969. Subsequently, successful pregnancies were described in the literatures around the world (10, 11). All of these studies reported the high rate and safe pregnancies and deliveries in patients

with thalassemia major and intermedia who were on precisely regular transfusion, iron chelation and endocrine managements. Deferoxamine is recommended in second and third pregnancy of thalassemia patients with severe iron overload, which has deleterious impacts on the health status of these patients.

2. Conclusions

The presence of sexual dysfunction and infertility in female thalassemic patients can be overcome with proper management. Although hypogonadotropic hypogonadism remains a common condition in thalassemia major, gonadal function is usually intact and fertility is usually retrievable. Women with thalassemia who are on precise management, regularly transfused and are well chelated can become pregnant either spontaneously or by inducing ovulation.

It is necessary that all pregnant thalassemia patients be followed up very closely. Apart from the routine pregnancy follow-up, thalassemic pregnant women need additional medical care. Hemoglobin levels should be carefully monitored and ferritin levels should also be measured and observed to avoid iron overload. Regular and periodic evaluation of cardiac function by a cardiologist should be done in all pregnant thalassemic women to prevent fluid overload. Pregnancy also seems to be safe in most patients with thalassemia intermedia, but larger and more detailed studies are needed.

Authors' Contributions

Mehran Karimi contributed to the study design and concept. Nader Cohan contributed to the drafting of the manuscript. Shirin Parand helped in editing.

References

1. Rund D, Rachmilewitz E. Beta-thalassemia. *N Engl J Med.* 2005;**353**(11):1135–46.
2. Martin A, Thompson AA. Thalassemias. *Pediatr Clin North Am.* 2013;**60**(6):1383–91.
3. Piel FB, Weatherall DJ. The alpha-thalassemias. *N Engl J Med.* 2014;**371**(20):1908–16.
4. Toumba M, Sergis A, Kanaris C, Skordis N. Endocrine complications in patients with Thalassaemia Major. *Pediatr Endocrinol Rev.* 2007;**5**(2):642–8.
5. De Sanctis V, Soliman AT, Elsedfy H, Skordis N, Kattamis C, Angastiniotis M, et al. Growth and endocrine disorders in thalassemia: The international network on endocrine complications in thalassemia (I-CET) position statement and guidelines. *Indian J Endocrinol Metab.* 2013;**17**(1):8–18.
6. Tuck SM. Fertility and pregnancy in thalassemia major. *Ann N Y Acad Sci.* 2005;**1054**:300–7.
7. Singer ST, Vichinsky EP, Gildengorin G, van Disseldorp J, Rosen M, Cedars MI. Reproductive capacity in iron overloaded women with thalassemia major. *Blood.* 2011;**118**(10):2878–81.
8. Pafumi C, Leanza V, Coco L, Vizzini S, Ciotta L, Messina A, et al. The reproduction in women affected by cooley disease. *Hematol Rep.* 2011;**3**(1):e4.
9. Yacobovich J, Tamary H. Thalassemia major and sickle cell disease in adolescents and young adults. *Acta Haematol.* 2014;**132**(3-4):340–7.
10. Thompson AA, Kim HY, Singer ST, Vichinsky E, Eile J, Yamashita R, et al. Pregnancy outcomes in women with thalassemia in North America and the United Kingdom. *Am J Hematol.* 2013;**88**(9):771–3.
11. Messina G, Colombo E, Cassinerio E, Cesaretti C, Marcon A, Zanaboni L, et al. Pregnant women affected by thalassemia major: a controlled study of traits and personality. *J Res Med Sci.* 2010;**15**(2):100–6.