

Living with Thalassemia

Issues in Thalassemia Care

For more information about thalassemia and pregnancy issues, or about other issues involved with thalassemia care, talk with your health care professional, or contact the Cooley's Anemia Foundation (800-522-7222 or info@cooleysanemia.org) or one of the Thalassemia Centers of Excellence.

The Thalassemia Centers of Excellence have the most highly trained thalassemia experts in the country. They are located at:

Children's Hospital Boston
Children's Hospital Los Angeles
Children's Hospital Oakland
Children's Hospital of Philadelphia
Children's Memorial Hospital (Chicago)
Weill Medical College of Cornell University (New York)



Many other hospitals are satellite centers affiliated with these Centers. Please contact the Cooley's Anemia Foundation for a list of these satellite centers.

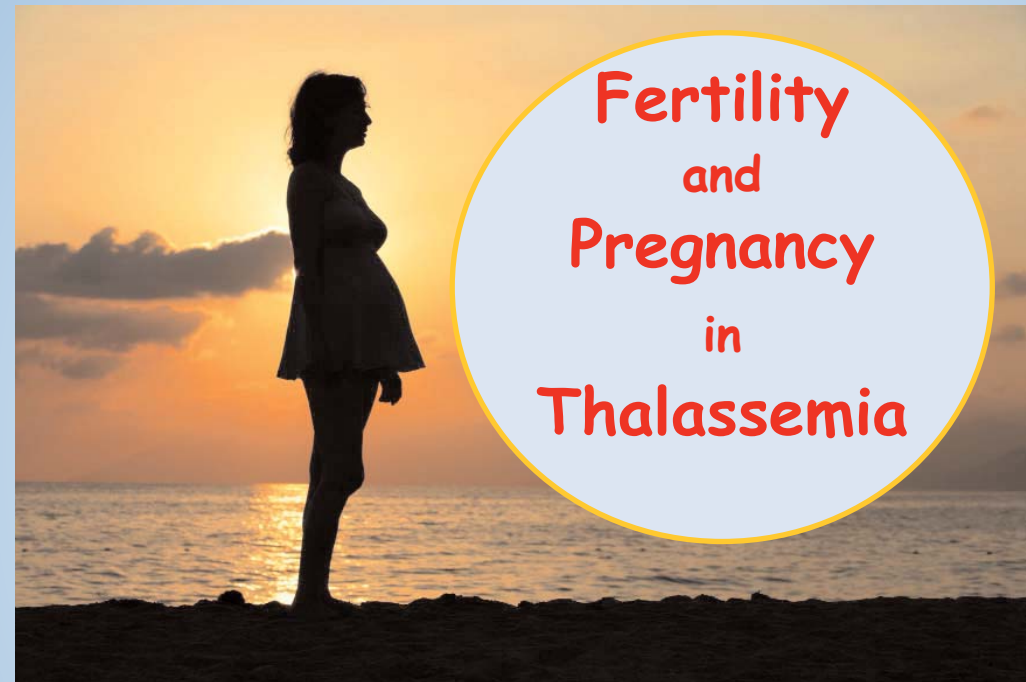
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Issues in Thalassemia Care



by Marie Martin, RN
and Craig Butler

In recent years, an increasing number of men and women with thalassemia in the United States have successfully started healthy families of their own. This booklet is intended to answer some of the questions that a person with thalassemia may have about the possibility of starting his/her own family.

Much of the information on fertility and pregnancy in thalassemia is “anecdotal,” meaning that it comes from the experiences and stories of individuals but has not been published in a medical journal and undergone careful review by a panel of experts. Because of this, there is still a lot that is not known, and so pregnancy in thalassemia is still to a large degree “uncharted territory.” But the increasing number of successful pregnancies does seem to indicate that many men and women with thalassemia do have a good chance of becoming parents, especially if they are in good health (generally) and well chelated (specifically).

Barriers to fertility in women and men with thalassemia

The iron overload associated with thalassemia can affect the development of both male and female sex organs, which can in turn affect the reproductive capabilities of a person with thalassemia.

A person with thalassemia may experience delayed puberty. Many of these patients eventually enter puberty. Some do not reach sexual maturity and have a complication called “hypogonadism.” This is due to a deficiency of hormones necessary for sexual maturation. In males, the deficiency of testosterone (male sex hormone) leads to underdevelopment of the penis and testicles. In women, lack of production of female sex hormones (estrogen, progesterone) results in lack of development of secondary sex characteristics. This means breast development does not progress, and menses often does not occur. Women who never begin menses are said to have primary amenorrhea. Women who transiently have menses are said to have secondary amenorrhea. Both conditions (primary and secondary) are caused by hormone deficiency induced by iron overload.

Delayed puberty, hypogonadism and amenorrhea are signs of hormone deficiency and likely fertility problems. Most affected males cannot produce adequate numbers of sperm. And affected

How did you feel about the pregnancy experience, and how do you feel about being a mother?

I was thrilled when I found out I was pregnant, and I was probably one of the happiest pregnant women ever. I was not expected to live as long as I have, and pregnancy was never a thought, so the idea of becoming a mom was almost surreal to me. It is truly a gift, and I am especially grateful, given all the health obstacles in my path and the fact that there are women who are much healthier than I that can't have children.

What else would you like to say?

I can't stress enough how important it is to prepare your body for pregnancy by getting yourself in the best possible health before pregnancy. It is crucial to have your hematologist on-board with your plans from the beginning, so they can help and support you. I also relied heavily on my family (in-laws and parents) for help, especially once the baby was born. Pregnancy and the baby's first 6 months are exhausting for a healthy woman, and can be incredibly trying for a woman with thalassemia. I don't think I could have done it without the help of my in-laws, especially when I had to go for blood when my daughter was only days old.

I think it is wonderful that people with thalassemia are now healthy enough to have children of their own. Pregnancy is truly a gift, but it can be exhausting on even the healthiest of women. So make sure you have support so that you can enjoy the experience to its fullest.



weeks, I went weekly (most healthy women go weekly after 36 weeks). I also had numerous ultrasounds, whereas a normal woman will only have 2 or 3 at most. In addition, I had a planned c-section, to try to avoid transmission of the hepatitis C and to try to control and reduce blood loss during delivery.

What changes in therapy did you have during your pregnancy? What things was your doctor "looking out for?"

As soon as I found out I was pregnant, I stopped my Desferal and was able to stop chelation therapy for the entire pregnancy. My hematologist closely monitored my ferritin levels to make sure they didn't go over 3000, in which case he would have put me back on Desferal (which didn't happen until 2 weeks after the delivery).

My hematologist also closely monitored my hemoglobins and made sure that my pre-transfusion hemoglobins were kept above 10. (Before pregnancy, I was transfused around 8 or 9). We had expected that I would need more frequent transfusions during the pregnancy, but this did not happen.

Were there any difficulties relating to thalassemia during your pregnancy?

No, I was very fortunate that way.

What advice would you give to a woman with thalassemia who wishes to have a baby?

Make sure to get your hematologist's blessings before trying to conceive. You will need their help and support throughout the pregnancy, so get them on-board from the beginning. This is especially important if you have complications from thalassemia (cardiac, endocrine, hepatitis C or HIV).

Get yourself in the best possible health before conceiving, because pregnancy is stressful on the body. Get your ferritins as low as possible, preferably below 1000, because it is better to avoid chelation therapy during the pregnancy, and in the first two trimesters, the ferritins will start to rise. Be prepared for more frequent transfusions. Although it didn't happen to me, it has happened to other pregnant women with thalassemia.

females do not ovulate. Thalassemia may induce other medical problems that can impair fertility, such as diabetes and hypothyroidism. In addition, a man or woman may have fertility issues that are unrelated to thalassemia. (The American Society for Reproductive Medicine estimates that 1 in 7 couples in the general population has some form of difficulty conceiving.)

Overcoming barriers to fertility

As with many other issues related to thalassemia, maintaining a proper chelation therapy may help prevent fertility issues from arising. The less iron in the body, the less likely it is to settle in the hypothalamus or pituitary and bring about fertility barriers.

A Little Bit About Sexual Development

In a male, sexual development and function is related to the coordinated efforts of the hypothalamus, the pituitary gland and the testes. The hypothalamus is a part of the brain with a great many functions, one of which is to create gonadotropin-releasing hormone (GnRH). The hypothalamus releases GnRH in small pulses; when it does so, the pituitary gland responds by releasing luteinizing hormone (LH) and follicle-stimulating hormone (FSH). The testes respond to the LH by generating testosterone. Testosterone, in turn, affects the development of the sex organs and the production of sperm. (Sperm production is further affected by FSH.)

In a male with thalassemia, excess iron in the blood may get deposited in the hypothalamus and/or the pituitary gland. When this happens, it may affect the pituitary's ability to create and release LH and FSH, thereby decreasing testosterone production and the subsequent maturation of the testes and the generation of sperm.

The hypothalamus also stimulates the creation of LH and FSH in the pituitary in females, with LH and FSH playing a part in creating estrogen and producing eggs. As with males, the presence of excess iron in the hypothalamus and/or the pituitary may impair the creation and release of these hormones and this may affect the development of the ovaries and eggs.

For those individuals for whom these fertility issues have already developed, hormone replacement therapy (estrogen and/or progesterone for women, testosterone for men) may be effective. Estrogen, progesterone and testosterone can be administered in a number of ways, including orally, topically and by injection. An experienced endocrinologist can advise individuals as to whether hormone replacement therapy is advisable and what specific therapy would be recommended. S/he can also discuss with individuals the advisability of other possible fertility treatments, such as clomiphene citrate (which helps induce ovulation) or assisted reproductive technologies (such as in vitro fertilization). However, any such decisions need to be made after consulting a medical professional with specific experience in infertility issues.

Things to Consider Before Conceiving

Every couple that is contemplating pregnancy usually weighs a number of factors (financial, personal, emotional, etc.) before moving forward with plans.



The man or woman with thalassemia may also want to consider other factors, such as having his/her partner tested to see if s/he carries the trait for a hemoglobinopathy (thalassemia, sickle cell, etc.)

For obvious physical reasons, there are many considerations that a woman needs to contemplate that don't apply to men.

As a woman with thalassemia, you need to ask:

- "Am I ready to enter a period of time during which my blood transfusions may increase, while my iron chelation therapy may be stopped altogether while I am pregnant?"
- "Do I have an appropriate support system of family and friends who will provide help after birth, when my own short-term and long-term medical needs have to be considered along with the needs of my baby?"
- "Are I and my partner in agreement about the advisability of pregnancy, given the possible risk, both to me and to the fetus, that may be involved?"

Do you have any advice for other men with thalassemia who wish to start a family?

My only advice is to go for it, if that's what you want to do. Worrying about it takes too much time and no one has time to waste. Nothing you worry about will ever replace the feeling of seeing your child in your arms, or the hugs, kisses and good times and bad that you experience raising children.

Did the experience of trying to create a pregnancy cause any changes in you (your outlook, feeling about therapy, etc.)?

After having a child, I found I was more concerned about my chelation therapy and overall health. I was happy to find that there are so many options open to me.

Parenthood may be difficult, but it is well worth it. Every birth is a miracle, every life is miracle, every person is a miracle. Doctors are God's gift to us to fix some of the mistakes that life causes. God didn't make any mistakes.



Words from a Mother with Thalassemia

A woman with thalassemia who is the mother of a healthy child shares some of her thoughts.

Were there any complications (related to thalassemia) involved in the process leading up to conception?

No, I have no endocrine complications or fertility issues due to iron overload, so conception was not an issue for me.

What did you, as a person with thalassemia, have to do or go through during pregnancy that is different from what a non-thalassemic person would have done or gone through?

Because of my thalassemia major and my positive hepatitis C status at the time, I went to a high-risk OB/GYN. From the onset of my pregnancy, I went to my OB every two weeks. (I think "normal" women go every 4 weeks), and at around 30

Words from a Father with Thalassemia

A man with thalassemia who is the father of two healthy children shares some of his thoughts.

When you and your wife decided you wanted to have a family, did you have any concerns that were related to the fact that you have thalassemia?

Yes, we had many concerns. We knew we wanted children and needed to know our options. My wife got tested for thalassemia trait. Since I was pretty healthy at the time, we didn't concern ourselves with the issue of getting pregnant as much as with issues of parenting and raising children. We let nature take its course; if it happened, we would be blessed, and if it didn't, we knew there were options (assisted reproduction, adoption, etc.). I think my biggest concern was that of any other father's - raising a child and meeting the financial liabilities and, in my situation, worrying about the financial burden if I became unhealthier in the future.

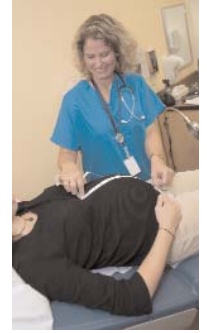
Were there any issues involved with thalassemia that affected the ability to bring about a successful conception?

Not really with our first, but more so with our second child. When we started trying for another child we ran into problems. My hormone levels dropped as a side effect of having thalassemia, so I needed some hormone therapy to get to the proper levels. I also had a varicocele (unrelated to my thalassemia) that needed repair. After treatment, we still had difficulties; my wife was checked, and both of us were fine. I discussed many of my concerns with my doctor only to realize that ultimately, my concerns weren't anything out of the usual. My biggest fear was the "what if's" health wise. It was a wake up call for me to do what I was supposed to do to keep as healthy as I possibly can.

We started looking into fertility options and drove ourselves crazy because the options weren't covered under our insurance. We needed to take a breather and think about the situation. We gave up worrying, and eventually (5 years later than planned), my son was born.

What are some of the challenges for a pregnant woman with thalassemia?

- Whether or not a woman has thalassemia, there is always some degree of risk associated with pregnancy. That risk increases for a woman with thalassemia, as the stress that is associated with any pregnancy may potentially worsen any existing problems with the heart, liver, etc. The healthier you are before you become pregnant, the better for both you and your baby.



- One of the first things to consider before entering into a pregnancy is that blood transfusion requirements typically increase during pregnancy; at the same time, iron chelation therapy is likely to be discontinued during pregnancy. For that reason, assessment of iron loading is crucial prior to and during pregnancy. Potential mothers should be aware that chronic anemia may have a negative effect on fetal growth and may also contribute to premature birth, so maintaining appropriate hemoglobin levels via more frequent transfusions is important both for maternal health and for fetal health.

The recommended discontinuation in iron chelation therapy is due to lack of information regarding how any current chelator may potentially affect the fetus. Because of the lack of data, doctors may choose to err on the side of caution; however, the exact chelation regimen will be determined based upon the overall health and iron loading of the individual patient.

Some doctors and patients who have undergone pregnancy report anecdotally that iron levels often do not rise as high as might be expected during pregnancy. A theory has been advanced that the fetus absorbs much of the excess iron and that it does so with no apparent harm to itself; however, there is not as yet sufficient published data to either support or dispute this theory.

- During a typical pregnancy, the heart has to work about 25-30% harder (and even more so during labor and delivery), which may increase the frequency with which a patient is transfused.

Cardiac function needs to be checked prior to pregnancy, and must be carefully monitored on a regular basis throughout the pregnancy. Those patients with cardiac issues, especially those related to iron overload, need to give careful consideration to the advisability of entering into a pregnancy. These patients must be closely followed by their cardiologist and by a high-risk perinatologist.



- Many women develop a form of diabetes during pregnancy. People with thalassemia already have an increased chance of developing diabetes due to iron overload, so pregnancy may increase this chance or may exacerbate an existing diabetic condition. Maintaining appropriate treatment for diabetes is essential throughout pregnancy, especially as diabetes can also lead to a higher risk of birth defects and complications that may affect delivery of the fetus.
- Hypothyroidism is a complication associated with iron overload that occurs in 10 percent of thalassemia patients. Hypothyroidism may develop during pregnancy and existing hypothyroidism may be exacerbated. This affects the metabolism, draining energy - which can be especially difficult during pregnancy, when a woman may already feel tired. The condition can be corrected by hormone replacement.
- Another common complication in thalassemia, low bone mass (osteopenia, osteoporosis), is often detected by a DEXA bone scan. When osteoporosis is diagnosed, it is often treated with bisphosphonate medication. This drug is usually not advised during pregnancy and breast feeding. All thalassemia patients with low bone mass need to ensure they get enough calcium and vitamin D. It is extra important during pregnancy.
- Some thalassemia patients have received blood-borne infections that can raise issues that need to be considered. Hepatitis and HIV may be passed on to a baby, and a mother with HIV has an increased risk of premature delivery. Women with either hepatitis or HIV may need to undergo appropriate

treatment before or during pregnancy to decrease the chance of passing on the infection to the baby. All potential mothers should be screened for different types of hepatitis and HIV before pregnancy is planned.

- Many women with thalassemia tend to be somewhat smaller than the average woman. This may result in a somewhat increased chance of delivery via cesarian section.
- Most patients re-start chelation therapy immediately following delivery. Use of oral chelators is discouraged for women who will be breast feeding, due to concerns that these chelators may be more easily passed on to the baby through breast milk. Although there is a lack of data regarding Desferal, most doctors believe there is less chance of it being absorbed into breast milk.

Pregnancy and parenthood mean a major change of life for any person. There are innumerable joys associated with both, just as there are many challenges. The fact that many people with thalassemia are now capable of experiencing life as parents is a remarkable development. We wish the best of luck to any patients that are considering embarking on this journey - and hope that they will make sure that they consult with a qualified team of thalassemia experts both before and throughout the term of pregnancy so that both mother and baby receive the most appropriate care.



On the following pages are interviews with two individuals with thalassemia who are parents and were willing to share their experiences. CAF believes that there is value in such personal stories but emphasizes again that their individual experiences are just that - individual. Each person's experience with pregnancy is different.