Hypothyroidism and its relation to pregnancy

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INTRODUCTION:
The body, in order to maintain its internal environment has to balance normal hormonal levels. But sometimes these levels change and the following manifestations of hyperthyroidism and hypothyroidism can be seen.

Hypothyroidism has the following clinical manifestations-tiredness, abnormal weight gain, baldness, bradycardia. And it brings about a phenomenal change during pregnancy. The effects can be studied by segregating them in different trimesters.

CONTENTS:
The variations that are bought about in the three trimesters have been extensively studied in the following research and review papers. There is change in the thyroid hormone levels throughout the pregnancy. Hypothyroidism can begin during pregnancy period or may be pre-existing. It is a challenging to diagnose hypothyroidism during pregnancy as some of the signs are related with that of pregnancy

FIRST TRIMESTER:
According to DHANWAL D.K and others, a total of thousand pregnant women who were attending Loknayak and Kasturba hospitals with a diagnosed thyroid disease were studied. The study subjects were approx of 25.6 years of age and mean gestational age was 10.3 weeks. According to this study hypothyrodism especially sub-clinical is found to be positive (13.4%) in North Indian women during first trimester.

SECOND TRIMESTER:
According to William L. Roberts and others 3064 blood specimens were collected from Asians (13%), Blacks (22%), Hispanics (23%), Whites (42%). TSH, total and free iodothyronine, thyroglobuline auto antibodies and thyroid peroxidase auto antibodies were measured. Serum samples were positive for TgAb and TPOAb in Asians (10.6%, 12.4%) - the highest and Blacks (1.8%, 4.1%) - the least respectively. Whites were found to have increased TSH. Asians had the lower and upper reference limits of TT3. By this study the women in the second trimester were found to have different reference from those of non-pregnant individuals.

THIRD TRIMESTER:
According to Bourcigaux and others 114 pregnant Persian women were studied at the third trimester of pregnancy. In this study there was an increase in thyroxine binding globulin were increased in all French pregnant women and FT4 levels were decreased by about 30%. The increase in total thyroxine were found to be only 27%. By this study there is insufficient iodine in women which could be responsible for deficient increase in TT4. It can be corrected by systemic iodine supplementation.

DISCUSSION:
According to the study in U.S 23512 pregnancies only one child was born due to the complications of hypo/hyperthyroidism in women. This data is from a consortorium of study labour between 2002 to 2008. According to the study by Casey and others pregnancy outcomes in women with elevated TSH and normal free thyroxine levels were evaluated by thyroid screening. Subclinical hypothyroid pregnant women Parkland hospital were chosen. The pregnancy outcome were compared with those in pregnant women whose TSH value is found to be normal. For the first 5th and 95th percentile of 25756 women who were screened only one infant was delivered. And 404 of those were considered to have subclinical hypothyroidism which were three times more likely to be complicated by placental abruption according to a study reported on in the New England Journal of Medicine in 1999. Babies born to mothers with untreated hypothyroidism are almost four times more likely to have lower IQs and learning difficulties, according to a study. The study went on to note, however, that children whose mothers were undergoing treatment for an underactive thyroid scored almost the same as children born to mothers with normal thyroid function.

According to research presented at the June 2000 Endocrine Society conference (“Maternal Thyroid Function During Early Pregnancy and Neurodevelopment of the Offspring,” June 21, 2000, Clinical Symposium: Impact of Maternal Thyroid Function on the Fetus and Neonate) there is increasing evidence that even normal FT4 levels that fall into the lowest tenth percentile during the early stages of pregnancy can be associated with poor infant development. Low-normal FT4 is not defined as maternal hypothyroidism when TSH is normal, but these outcomes indicate that screening and treatment for thyroid problems may be warranted in all women.
The study concluded that women with a low normal FT4 -- in the lowest 10th percentile at 12 weeks' gestation -- are at risk for children with developmental delay. Further, the researchers found that “TSH, during early gestation, seems to be without any value to pick up these women at risk.”

According to Joanne F. Rovet The study involved 36 six-month-old infants born to hypothyroid women treated with levothyroxine, who were diagnosed prior to or during their pregnancies, and 22 control infants. Children of women with hypothyroidism—a condition scored almost the same as children born to healthy mothers. These findings suggest that early detection and treatment of hypothyroidism in pregnant women may be a critical part of prenatal care. From 25,216 frozen serum samples obtained during pregnancy, researchers identified 62 women who had children between January 1987 and March 1990 and who, in retrospective analysis, were identified as having been hypothyroid during their pregnancies. These children were compared to a carefully matched group of 124 control children whose mothers' thyroid function in pregnancy was normal.

At the time of the study, the children ranged in age from 7 to 9 years. They participated in a series of 15 psychological tests relating to intelligence, attention, language, reading and school problems, and visual-motor performance.

The children born to mothers who were hypothyroid during pregnancy scored an average of 4 points lower in IQ tests than the control children, and 15 percent had IQ scores lower than 85, compared to only 5 percent of the control children who scored that low. Overall, the case children scored poorer on all 15 individual tests than the children born to healthy mothers.

Of the 62 women with hypothyroidism, 48 did not receive treatment during pregnancy, reading and school problems, and visual-motor performance.

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Children born to mothers with untreated hypothyroidism during pregnancy score lower on IQ tests than children of healthy mothers, according to a study conducted by Dr. James Haddow and partially funded by the National Institute of Child Health and Human Development (NICHD) and reported in the August 19 issue of the New England Journal of Medicine. However, children whose mothers were being treated for the condition scored almost the same as children born to healthy mothers. These findings suggest that early detection and treatment of hypothyroidism in pregnant women may be a critical part of prenatal care. From 25,216 frozen serum samples obtained during pregnancy, researchers identified 62 women who had children between January 1987 and March 1990 and who, in retrospective analysis, were identified as having been hypothyroid during their pregnancies. These children were compared to a carefully matched group of 124 control children whose mothers' thyroid function in pregnancy was normal.

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If the 62 women with hypothyroidism, 48 did not receive treatment during pregnancy for their condition. Their children's IQ scores averaged 7 points lower than children of mothers without the condition, and 19 percent had IQ scores below 85. However, the children born to mothers who were receiving treatment scored similarly to the control children, suggesting that treatment can help mitigate the adverse effects.

REFERENCES

[1] Surks MI, Ortiz E, Daniels GH, et al. Subclinical thyroid disease: scientific review and guidelines for diagnosis and management. JAMA 2004; 291:228.
[7] Loh JA, Wartofsky L, Jonklaas J, Burman KD. The magnitude of increased levothyroxine requirements in hypothyroid pregnant women depends upon the etiology of the hypothyroidism. Thyroid 2009; 19:269.


[38] Aín KB, Mori Y, Refetoff S. Reduced clearance rate of thyroxine-binding globulin (TBG) with increased sialylation: a mechanism for estrogen-induced elevation of serum TBG concentration. J Clin Endocrinol Metab 1987; 65:689.


[44] Lockwood CM, Grenache DG, Gronowski AM. Serum human chorionic gonadotropin concentrations greater than 400,000 IU/L are invariably associated with suppressed serum thyrotropin concentrations. Thyroid 2009; 19:863.


[72] Surks MI, Ortiz E, Daniels GH, et al. Subclinical thyroid disease: scientific review and guidelines for diagnosis and management. JAMA 2004; 291:228.
