Mild to moderate iodine deficiency affects women’s ability to become pregnant


Insufficient iodine intakes among women who are pregnant or planning a pregnancy are a public health problem in many countries, even where school-age children are iodine sufficient. A study was conducted to determine whether a low urinary iodine concentration (UIC) in women attempting to become pregnant is associated with delayed conception.

Study design
A prospective cohort study enrolled 501 couples from 16 counties in Michigan and Texas, U.S., shortly after they discontinued using contraception and were planning a pregnancy (1). The subjects kept a daily record to track lifestyle, sexual activity, menstruation, and pregnancy test results. Women used the Clearblue Easy™ digital home pregnancy test to help ensure that intercourse coincided with ovulation. Pregnancies were identified promptly by the Clearblue Easy™ digital home pregnancy test (2). Pregnancy was defined as a positive hCG test on the day menstruation was expected. Spot urine samples used for iodine and creatinine determinations were collected at the time of enrollment.

Four hundred and sixty-seven women provided sufficient urine samples for analysis. Over the 12-month course of the study, 332 (71%) women became pregnant, 47 (10%) did not become pregnant, and 88 (19%) withdrew or were lost to follow-up. Women who became pregnant were younger, more likely to have college education or income, more likely to have college education or income, more likely to have college education or income, and more likely to have college education or income, more likely to have college education or income, more likely to have college education or income, and more likely to have college education or income, or severe (<20 μg/L) deficient range were more common in the women who did not become pregnant (29.8%) compared with the women who became pregnant (21.4%), but this difference did not reach statistical significance (p = 0.23).

Conversely, women who had urinary iodine concentrations in the moderately or severely deficient range took significantly longer to become pregnant, experiencing a 46% decrease in the probability of becoming pregnant over each menstrual cycle compared with the iodine sufficient group. This delay in time to pregnancy raises serious concerns.

Despite a lack of studies of iodine deficiency and its effect on the ability to conceive in humans, insufficient iodine is well known to cause hypothyroidism, and there is evidence for a number of mechanisms by which hypothyroidism could cause infertility. Low thyroid hormone concentrations are associated with thyrotropin-releasing hormone (TRH) elevation that stimulates prolactin, which in turn interferes with GnRH pulsatility, required for normal reproductive function. They also cause decreased production of sex steroids by granulosa cells and alterations in androgen and estrogen concentrations.

Conclusions
This study offers guidance for establishing target iodine concentrations in women of childbearing age. The demand for iodine increases substantially during pregnancy, which is reflected in a higher UIC threshold for iodine sufficiency (150 μg/L instead of 100 μg/L in non-pregnant populations). Therefore, it is reasonable to assume that a median UIC of at least 100 μg/L is desirable in women of childbearing age who may become pregnant. Further studies should determine whether iodine deficiency might be added to a list of considerations when evaluating women who are struggling to conceive. Countries where iodine deficiency is common should evaluate the need for programs to increase iodine intake for women of childbearing age and pregnant women.

References