The effect of high-normal thyroid stimulating hormone levels on IVF and pregnancy outcomes in euthyroid women undergoing IVF

Objective: To assess the effect of high-normal serum thyroid-stimulating hormone (TSH) levels on IVF and pregnancy outcomes in euthyroid women.

Methods: Retrospective cohort study.

Patients: A total of 226 IVF/intracytoplasmic sperm injection (ICSI) cycles in 226 euthyroid women without past or current history of thyroid disorder.

Intervention: According to the basal serum TSH level before controlled ovarian stimulation (COS), patients were divided into the high-normal TSH group (2.5<TSH<5.0 mIU/l) and the control group (0.4<TSH<=2.5 mIU/l).

Main Outcome Measures: COS and IVF results, and pregnancy outcome.

Results: The number of grade 1 or 2 embryos was significantly lower in the high-normal TSH group (P=.018). The serum TSH level on the day of serum β-hCG measurement was significantly higher in the high-normal TSH group (P<.001). There were no differences in the clinical pregnancy rate (PR) and embryo implantation rate between the two groups. Live birth rate appeared to be lower in the high-normal TSH group of 32.7% (33/101) compared with 42.4% (53/125) in the control group, but the difference did not achieve the statistical significance. The ratio of the pregnant women of which thyroxine (T4) treatment was needed by TSH levels higher than 2.5 mIU/l in the first trimester of pregnancy was significantly higher in the high-normal TSH group (P<.001).

Conclusions: High-normal basal serum TSH level of 2.5 to 5.0 mIU/l can have an unfavorable effect on oocyte and embryo quality, and this condition is significantly associated with the development of subclinical or overt hypothyroidism requiring T4 treatment in the early stage of pregnancy following IVF/ICSI in euthyroid women.