

EVALUATION OF THE DYNAMICS OF THYROID HORMONES LEVELS DURING NORMAL PREGNANCY BY ELISA

Background: Pregnancy is associated with changes in thyroid function, which are result of a normal physiologic state.

Methods. Levels of thyroid stimulating hormone (TSH), free thyroxine (FT4), free triiodothyronine (FT3), total thyroxine (TT4), total triiodothyronine (TT3) during normal pregnancy were evaluated using ELISA kits (RPC Diagnostic Systems, Russia).

Results: Two groups of samples were investigated. The first group consisted of 360 serum samples from white women with normal pregnancy (Central Russia and Volgo-Viatsky Region, from 4 to 39 gestational weeks). The second group included 103 serum samples from white non-pregnant women (the same region). The Mann-Whitney U test (in case of non-normal distribution) and t-statistic (in case of normal distribution) were used to compare differences between two independent groups. TSH level was lower in pregnancy state (1 trimester - median 1.26, $P < 0.001$; 2 trimester - median 1.39, $P = 0.003$; 3 trimester - median 1.61, $P > 0.05$) than in normal state (median 1.83 $\mu\text{IU/mL}$). FT4 level was lower in pregnancy state (1 trimester - median 13.7, $P > 0.05$; 2 trimester - median 13.0, $P < 0.001$; 3 trimester - median 10.7, $P < 0.001$) than in normal state (median 14.1 pmol/L). FT3 level was the same in pregnancy state (1 trimester - median 2.97, $P > 0.05$; 2 trimester - median 2.99, $p > 0.05$; 3 trimester - median 2.72, $P > 0.05$) as in normal state (median 2.91 pg/mL). TT4 level was greater in pregnancy state (1 trimester - median 123, $P < 0.0001$; 2 trimester - median 133, $p < 0.0001$; 3 trimester - median 127, $P < 0.0001$) than in normal state (median 96 nmol/L). TT3 level was greater in pregnancy state (1 trimester - median 1.40, $P < 0.0001$; 2 trimester - median 1.61, $P < 0.0001$; 3 trimester - median 1.73, $P < 0.0001$) than in normal state (median 1.19 ng/mL).

Conclusions. We observed a statistically significant suppression serum TSH in the 1 trimester of pregnancy when the human chorionic gonadotropin levels reach their peak. Concentrations of FT4 decrease during pregnancy in contrast to FT3 due to the high affinity of thyroxine-binding globulin for T4. Total T4 and T3 levels increase from 1 to 2 trimesters and they reach a plateau from 2 trimester to term. We defined normal trimester specific limits for these hormones in Central Russia population.