

Establishing reference intervals for thyroid associated hormones and evaluating the prevalence of thyroid diseases by data mining

Yutong Zou

Department of Clinical Laboratory, Peking Union Medical College & Chinese Academy of Medical Science, China

Background: Given the high prevalence and diagnostic difficulty of thyroid disorders, especially subclinical thyroid diseases, we aimed to establish reference intervals (RIs) for thyroid associated hormones to help conduct reliable and accurate diagnosis and treatment, and evaluate the prevalence of thyroid diseases.

Method: From January 1, 2014, to December 31, 2018, 280,206 apparently healthy subjects were retrieved from the department of Health Care in Peking Union Medical College Hospital (PUMCH). With ultrasound screening results, thyroid related antibody results and Tukey method being used to exclude outliers, 20,192 apparently euthyroid adults with thorough demographic and thyroid associated results were finally included in this study. Thyroid associated hormones were detected by the Siemens ADVIA Centaur XP automatic chemiluminescence immunoassay analyzer. According to the Clinical Laboratory and standard institution (CLSI) C28-A3, the RIs were calculated as the 2.5th and 97.5th percentiles (P2.5, P97.5) with nonparametric analysis, and compared with the RIs provided by the manufacturer. Additionally, the prevalence of thyroid diseases during whole five consecutive years was evaluated.

Results: The RIs for TSH, FT4, FT3, TT4, and TT3 were 0.71-4.80 mIU/L, 12.2-20.0 pmol/L, 3.9-6.0 pmol/L, 65.6-134.8 nmol/L, and 1.2-2.2 nmol/L, respectively. Except for TT4, they all showed significant differences between males and females. Respectively, the prevalence of clinical hypothyroidism was 0.5% in males and 0.8% in females, clinical hyperthyroidism was 0.3% in males and 0.6% in females, subclinical hypothyroidism was 3.6% in males and 5.6% in females, and subclinical hyperthyroidism was 2.4% in males and 2.9% in females according to the RIs established in this study, which were different from those reported by the manufacturer. Furthermore, the prevalence of thyroid diseases took on difference for women of childbearing age.

Conclusion: Sex-specific RIs were established for TSH, FT4, FT3, TT4 and TT3 in the Chinese population, and the prevalence of both clinical and subclinical thyroid diseases was evaluated. More attention should be paid to thyroid disorders.

Biography

Yutong Zou has completed her university at the age of 22 years from Wuhan University, and continue to study for a doctorate in department of clinical laboratory, Peking Union Medical College Hospital, Peking Union Medical College & Chinese Academy of Medical Science postdoctoral. She majors in clinical chemistry, and mass spectrometry and chromatography technology.