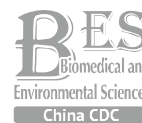


Original Article

**Prevalence of Thyroid Nodules and Its Relationship with Iodine Status in Shanghai: a Population-based Study***

SONG Jun^{1,^}, ZOU Shu Rong^{1,^}, GUO Chang Yi¹, ZANG Jia Jie¹, ZHU Zhen Ni¹,
MI Ming², HUANG Cui Hua¹, YU Hui Ting³, LU Xi⁴, RUAN Ye⁵, and WU Fan^{1,#}

1. Department of Nutrition Hygiene, Shanghai Municipal Center for Disease Control and Prevention, Shanghai 200336, China; 2. Department of Food Hygiene & Food-Borne Disease Control, Shanghai Municipal Center for Disease Control and Prevention, Shanghai 200336, China; 3. Department of Health Statistics, Shanghai Municipal Center for Disease Control and Prevention, Shanghai 200336, China; 4. Department of School Health, Shanghai Municipal Center for Disease Control and Prevention, Shanghai 200336, China; 5. Department of Diabetes Mellitus Control and Prevention, Shanghai Municipal Center for Disease Control and Prevention, Shanghai 200336, China

Abstract

Objective This study was designed to evaluate the prevalence of thyroid nodules (TNs) and its relationship with urine iodine concentrations (UICs) after the regional rapid economic growth and lifestyle changes.

Methods A cross-sectional survey was conducted in the general population aged 15-69 years. A questionnaire regarding general and personal characteristics and relevant information was administered. Ultrasonography of the thyroid was performed, and serum triiodothyronine (T3), tetraiodothyronine (T4), serum thyroid stimulating hormone (TSH), free triiodothyronine (FT3), free tetraiodothyronine (FT4), thyroglobulin antibody (TgAb), thyroid peroxidase antibody (TPOAb), and TSH receptor antibody (TRAb) levels were measured for each individual subject.

Results The prevalence rates of TNs in the whole population, females and males were 27.76%, 34.04%, and 21.60%, respectively. The prevalence of multiple nodules increased with age, whereas the prevalence peaks differed between males and females. The median UICs in the whole population and females with non-TNs were higher than those of subjects with TNs ($P=0.0035$, $P=0.0068$). The median UICs in subjects with a single TN were higher than those in subjects with multiple TNs ($P=0.0164$, $P=0.0127$). The result showed a U-shaped curve relationship between UIC and prevalence of TNs. The prevalence of TNs was the lowest when the UIC was 140-400 $\mu\text{g/L}$.

Conclusion The prevalence of TNs was nearly 30% and increased with age. The relationship between UIC and prevalence of TNs is U-shaped, with an increase in risk when the UIC was $<140 \mu\text{g/L}$ and $>400 \mu\text{g/L}$. Very low or high UIC levels need attention and correction.

Key words: Thyroid Nodules, Prevalence, Urine iodine, Epidemiology

Biomed Environ Sci, 2016; 29(6): 398-407

doi: 10.3967/bes2016.052

ISSN: 0895-3988

www.besjournal.com (full text)

CN: 11-2816/Q

Copyright ©2016 by China CDC

*This study was supported by Shanghai Municipal health Bureau (number 20134332); the research grants of the Shanghai Municipal Bureau of Health (number 20134053); Health Fields Specific Research Grant (201202012); the Major Project of Shanghai Municipal Science and Technology Commission (11DJ1400202); the four grants from Key Discipline of Shanghai Public Health-Food and Nutrition Sciences (12GWZX0702); and Shanghai Rising-Star Program (15YF1411100).

[^]These authors contributed equally.

[#]Correspondence should be addressed to WU Fan, Tel: 86-21-62758710, E-mail: wufan@scdc.sh.cn

Biographical notes of the first authors: SONG Jun, female, Master of public administration, majoring in nutritional survey and laboratory testing; ZOU Shu Rong, female, Master of nutrition and food science, nutritional survey.

INTRODUCTION

Increasing age, iodine deficiency, female sex, and a history of head and neck radiation increase the risk of thyroid nodules (TNs)^[1-2].

The prevalence of palpable TNs has been estimated to be approximately 5% in women and 1% in men living in iodine-sufficient areas of the world^[3-4]. Moreover, nodules were incidentally found with a prevalence of 19%-67%^[5] on ultrasonography and 8.2%-65% based on autopsy data^[6-7].

During the past several decades, an increasing number of outpatient cases of TNs and cancer have been reported by clinicians in Shanghai, China. An increasing incidence of thyroid cancer has been reported in some European countries^[8-9], the United States^[10], and some regions of China^[11]. Moreover, the International Agency for Research on Cancer (IARC)^[12] has reported that the incidence of thyroid cancer has increased in most other countries and areas. A pooled analysis of individual data from 12 case-control studies conducted in seven countries, which provided more precise estimates than previously available on the relationship between benign thyroid diseases and mostly well-differentiated, nonmedullary thyroid cancer, showed that benign nodules/adenomas are the strongest risk factors for thyroid cancer besides radiation in childhood^[13]. The analysis revealed that women with a history of benign nodules or adenomas have an approximate 30-fold increased risk for thyroid cancer. Elevated risks are observed in men and women and in relation to both major histological thyroid cancer types. No significant heterogeneity across geographic areas or across studies has been observed. The excess risk is greatest within 2-4 years prior to thyroid cancer diagnosis; however, elevated odds ratios (ORs) also reveal a risk of 10 years or more prior to cancer^[14]. To understand the current status in the region of Shanghai, epidemiological studies exploring numerous factors influencing thyroid disorders were conducted.

Rapid economic development and the consequent improvement in living conditions, nutrition, and health care have resulted in declines in deaths due to infectious diseases, which in turn led to increases in chronic diseases in China^[15] with the rapid economic development and urbanization in Shanghai, which is one of the biggest and most developed cities in China and has experienced an epidemiological transition shifting from infectious to

chronic diseases in a much shorter time than several other cities, people have been facing remarkable variations in pollution, nutrition, lifestyle, and stress^[16-18]. The incidence rate of thyroid cancer in Shanghai increased from 1.64 per 100,000 in the 1981-1983 period to 2.96 per 100,000 in the 1999-2001 period. The incidence rate of thyroid cancer increased rapidly and reached 13.65 per 100,000 in the whole population and 20.6 per 100,000 among females in 2010. Thyroid cancer was ranked as the third most commonly diagnosed cancer in females in Shanghai in 2010^[19]. The correlation between TNs and cancer remains unclear. Whether the abovementioned factors and which of these factors are involved in the increase of thyroid cancer in Shanghai population are not clear. Moreover, no study has yet surveyed the prevalence and condition of TNs in a normal population in Shanghai, which is critical for public health because of its potential risk of serious clinical outcomes.

Shanghai has been following implementation of universal salt iodization to prevent iodine deficiency diseases since 1996. The median urine iodine concentration (UIC) increased from 72.3 µg/L (urban) and 52.2 µg/L (suburban) before universal salt iodization to 179.2 µg/L in 2014. Correlation between urinary iodine level and TN is an important aspect that needs to be explored.

The aims of this study were to reveal the incidence of TNs in a normal population aged from 15 to 69 years in Shanghai and to investigate the relationship between the incidence of TN and iodine nutrition status. The results obtained from this study would provide us a basis to understand the current epidemiological status of thyroid disorders, thereby advancing government policies on disease control.

MATERIALS AND METHODS

Population

The survey, which aimed to assess the prevalence of thyroid diseases in the whole population of Shanghai after the introduction of salt iodization for 13 years, was conducted from September 2009 to December 2009. A multistage, stratified random sampling scheme was used to recruit participants from the general population. Individuals aged from 15 to 69 years were randomly recruited from selected resident groups in each neighborhood or village. All residents who had been living in Shanghai for more than 12 months were

Download English Version:

<https://daneshyari.com/en/article/4195713>

Download Persian Version:

<https://daneshyari.com/article/4195713>

[Daneshyari.com](https://daneshyari.com)