

The impact of lifestyle factors on hyperthyroidism in the Chaoshan region

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Abstract. The research carried out in this study provides valuable insights into the intricate dynamics of thyroid disorders in the Chaoshan region of China, exploring risk factors, demographic correlations, and the essential role of iodine intake. It uncovers the complex relationships between iodine levels, thyroid health, and demographic characteristics, highlighting the public health implications and the need for targeted interventions. The purpose of this research was to elucidate the landscape of thyroid disorders within this specific region and how various factors, including iodine intake and demographic variables, influence thyroid health.

Keywords: Thyroid Disorders, Iodine Intake, Chaoshan Region

1. Introduction

1.1. Introduction

Hyperthyroidism refers to an endocrine disease in which excessive secretion of thyroid hormones leads to overactive metabolism throughout the body. Patients may experience symptoms such as weight loss, palpitations, sweating, shaking hands, and protruding eyeballs. In severe cases, serious complications such as heart failure and shock may occur. The causes of hyperthyroidism are diverse, including genetic, immune, inflammatory, and other factors, and lifestyle factors are also one of its important triggers.[1]

1.2. The significance of studying the influencing factors of hyperthyroidism

1.2.1. Delving into demographic risk factors provides a nuanced understanding of who is most at risk, enabling targeted interventions and awareness campaigns. This focused approach is likely to be more effective and efficient, ensuring that those most in need receive appropriate attention and care.[3]

1.2.2. The exploration of lifestyle factors contributing to hyperthyroidism will be instrumental in devising preventative strategies. As lifestyle choices often play a pivotal role in the manifestation and management of various diseases, insights from this objective can guide community health campaigns, encouraging healthier habits that reduce the risk of hyperthyroidism.

1.2.3. Genetic factors and the prevalence of hyperthyroidism in family clusters, has the potential to revolutionize individualized patient care. By understanding the genetic predisposition, healthcare providers can implement early detection strategies for at-risk individuals, ensuring timely interventions and better health outcomes.

1.2.4. By integrating epidemiological data with shifts in regional iodine intake, the research promises to provide a holistic understanding of hyperthyroidism's etiology in the Chaoshan region. Such a comprehensive view will not only benefit local clinical practices but also provide a model for other regions globally with similar demographic and environmental characteristics. In essence, the significance of this research is manifold, with the potential to influence both regional and global thyroid health practices and policies.

1.3. Research objectives

RO1: To investigate the demographic risk factors associated with hyperthyroidism in this population.

RO2: To investigate the contribution of lifestyle factors to hyperthyroidism.

RO3: To study the impact of genetic factors by evaluating the prevalence of hyperthyroidism in family clusters

RO4: To integrate iodine intake urinary iodine concentration studies.

1.4. Research Hypothesis

The findings from this study can provide valuable insights into the unique patterns and determinants of hyperthyroidism in the Chaoshan region. These can guide targeted public health interventions for prevention and control of hyperthyroidism, including health education, dietary modifications, and improved screening and healthcare services (Ikegami, Refetoff, Van Cauter, & Yoshimura, 2019). These findings could potentially augment the international comprehension of hyperthyroidism by facilitating comparisons with data from distinct regions and populations, thereby enhancing the scientific literature pertaining to this condition.

1.5. Scope of Research [4]

1.5.1. Study Population and Sample (Sample Sampling). The study's foundation is the comprehensive medical data sourced from January 2012 to December 2022, encompassing a vast network of 15 reputed hospitals and clinics within the Chaoshan region. The emphasis on these institutions stemmed from their robust patient records and their excellence in diagnosing and treating thyroid anomalies. From this data, 1003 individuals diagnosed with hyperthyroidism were earmarked. Rigorous criteria ensured that only those with a definitive diagnosis, as ascertained by endocrinology specialists and substantiated through laboratory tests like elevated T3 and/or T4 and suppressed TSH levels, were included. Ensuring ethical adherence, patient information was anonymized to maintain confidentiality. The study's focus on this specific region over a decade provided invaluable insights into hyperthyroidism's epidemiology, unearthing its prevalence, associated risks, and other pertinent trends. Specific criteria were set, where only patients having a clear diagnosis, supported by clinical evidence, were included, while those with incomplete records, other thyroid issues, or secondary causes of hyperthyroidism were excluded.[3]

1.5.2. Content/Variables (Dependent and Independent Variables) - Study Area. Central to this research are a range of variables meticulously studied. Iodine intake is emphasized due to its

consequential link with thyroid health, gauging the levels of iodine consumption mainly sourced from dietary habits. Gender, another variable, highlights the inherent biological and societal distinctions separating males from females. Within the study's framework, the notable discrepancies in the occurrence of thyroid disorders based on gender suggest multifaceted influences that might be both biological and societal. Lifestyle risk factors, although not elaborated in detail, likely encompass individual habits and behaviors impacting thyroid health. Genetics, inherently encoding our hereditary information in our DNA, may predispose certain individuals to thyroid-related disorders. Lastly, the prevalence of thyroid disorders is critical, measuring the fraction of the population diagnosed with these disorders. This study, by emphasizing such demographic nuances, reveals a distinctive thyroid disease prevalence pattern in the Chaoshan region.

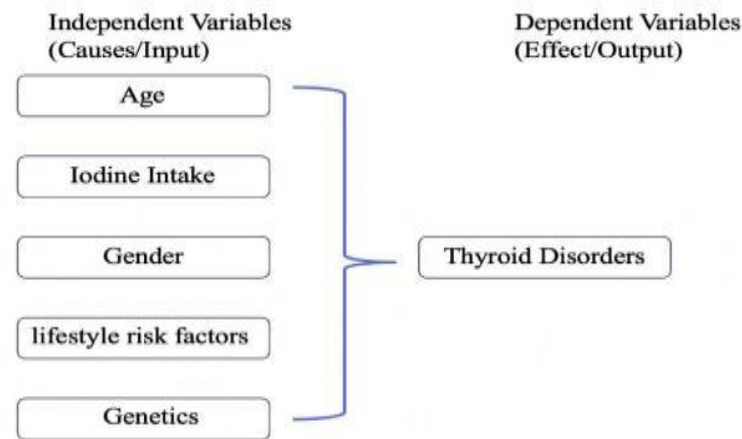
1.5.3. Time of Data Collection [6]. The data collation spanned a decade, from January 2012 to December 2022, providing an extended window into the medical landscape of hyperthyroidism in the Chaoshan region. Through the standardized form, researchers meticulously gathered insights from each patient's records, ranging from demographic information to dietary habits and more. Furthermore, supplementary methods like dietary surveys and urinary iodine measurements deepened the insights, painting a comprehensive picture of hyperthyroidism's occurrence, risk factors, and management in the community. This decade-long study was instrumental in offering a longitudinal and in-depth view of the disease's.

2. Literature review

2.1. Overview of hyperthyroidism

Hyperthyroidism is a common endocrine disorder that results from an excessive synthesis and secretion of thyroid hormones by the thyroid gland. The condition is characterized by an increased metabolic rate, which affects nearly every system in the body. Symptoms are diverse, ranging from weight loss, increased heart rate, and anxiety, to heat intolerance, hyperactivity, and tremors. The most common forms of hyperthyroidism are Graves' disease, toxic multinodular goiter, and solitary toxic adenoma. Graves' disease, in particular, is an autoimmune disorder in which antibodies mimic the action of thyroid-stimulating hormone (TSH), leading to overproduction of thyroid hormones. Hyperthyroidism can be diagnosed through a series of tests including blood tests for TSH, free T4, free T3, and TSI (thyroid-stimulating immunoglobulin) levels, along with imaging studies like thyroid ultrasound and radioactive iodine uptake test. Management strategies include antithyroid medications, beta-blockers, radioactive iodine, and surgical removal of the thyroid gland, chosen based on patient's age, severity and cause of the disease, and patient preference. Despite the availability of effective treatments, the condition can cause serious health problems if left untreated, such as heart disorders, brittle bones, thyrotoxic crisis, and eye problems, thereby emphasizing the importance of early diagnosis and proper management.

2.2. *Research model*



3. **Research Method**

The research methods of lifestyle factors on hyperthyroidism may include the following steps:

1. Data collection: Collect relevant data on patients with hyperthyroidism through questionnaire surveys, interviews, or observations, including their lifestyle, dietary habits, exercise habits, psychological status, etc.
2. Sample selection: Select representative samples from the target population, which can be randomly or systematically sampled.[3]
3. Data analysis: Conduct statistical analysis on the collected data, including descriptive statistics and inferential statistics. Through descriptive statistics, the basic characteristics of the sample and the interrelationships between variables can be obtained; By inferential statistics, differences and connections between sample data can be analyzed.

It should be noted that this is only a possible research conclusion and suggestion, and specific research conclusions and suggestions should be analyzed and formulated based on factors such as different regions, populations, and research conditions. At the same time, when implementing these suggestions, attention should be paid to individual differences and actual situations to avoid unnecessary side effects and risks.[4]

References

- [1] Song Shilin,Li Yuanyuan,Lv Lin,Dong Mengqi,Qin Zhanfen.Tetrabromobisphenol A exerts thyroid disrupting effects but has little overt impact on postnatal brain development and neurobehaviors in mice[J].Journal of Environmental Sciences,2024,1421-10.
- [2] Chen Guanyuan,Tan Guanghua,Duan Mingxing,Pu Bin,Luo Hongxia,Li Shengli,Li Kenli.MLMSeg: A multi-view learning model for ultrasound thyroid nodule segmentation[J].Computers in Biology and Medicine,2024,169107898-.
- [3] Pinto Jessica O.,Livhits Masha J.,Yeh Michael W.,Kaykov Atanas,Klopper Joshua P.,Kloos Richard T.,Alshalalfa Mohammed,Hao Yangyang,Huang Jing,Endo Mayumi.Histopathology of telomerase reverse transcriptase promoter (TERT) mutated indeterminate thyroid nodules[J].Journal of Clinical Translational Endocrinology,2024,35100329-.
- [4] Fu Bifei,Lou YuMing,Lu Xiaofeng,Wu Zhaolin,Ni Junjie,Jin Cong,Wu Pu,Xu Chaoyang.tRF-1:30-Gly-CCC-3 inhibits thyroid cancer via binding to PC and modulating metabolic reprogramming.[J].Life science alliance,2024,7(3):
- [5] Zhang Dou,Kong Fanming,Gao Fangfang,Li Longhui,Liang Yangyueying,Yu Minghui,Zhao Lu,Wang Na,Jia Yingjie.Clinical efficacy of Camrelizumab combined with first-line chemotherapy in extensive-stage small-cell lung cancer[J].Heliyon,2024,10(1):e22913-.