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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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THE RELATION OF THYROID DISTURBANCE AND ISCHEMIC HEART DISEASE IN IRAQI PATIENTS

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Abstract.

This study conducted in Baghdad focused on patients with coronary heart disease admitted to three hospitals. The study included 60 Iraqi patients with coronary heart disease and a control group of 30 healthy individuals. Blood samples were collected from both groups after fasting. The study analyzed the demographic characteristics of the patients and control group, including age groups, sex distribution, and BMI. The majority of patients had hypertension, while 58.33% had diabetes. The study found that IHD patients had significantly higher T3 and T4 levels compared to the control group. However, there was no significant difference in TSH levels. The study also examined thyroid function parameters among different age groups and found no significant differences in individuals with hypothyroidism. The highest prevalence of hyperthyroidism was among individuals with hypertension, while the highest spread of hypothyroidism was among individuals with diabetes. The study observed significant differences in mean HbA1c levels among the three groups, with the highest levels in patients with hypothyroidism. In conclusion, this study suggests potential alterations in thyroid function associated with ischemic heart disease and emphasizes the need for further research on the clinical implications and underlying mechanisms involved.

Key words. Thyroid hormones, ischemic heart diseases, hyperthyroidism, hypertension.

Introduction.

Ischemia is defined as inadequate blood supply (circulation) to a local area due to blockage of the blood vessels supplying the area. Ischemic means that an organ (e.g., the heart) is not getting enough blood and oxygen. Ischemic heart disease, also called coronary heart disease (CHD) or coronary artery disease, is the term given to heart problems caused by narrowed heart (coronary) arteries that supply blood to the heart muscle [1]. Coronary artery disease (CAD) is characterized by the occlusion or stenosis of coronary artery mostly caused by atherosclerosis and is one of the leading causes of mortality in humans [2]. Patients with CAD are vulnerable in development of major cardiovascular events including nonfatal acute myocardial infarction, unstable angina, stroke, transient ischemic attack, peripheral arterial occlusive disorder, and death [3]. Thyroid hormones play a crucial role in regulating various physiological processes, including metabolism, cardiovascular function, and lipid metabolism. Imbalances in thyroid hormone levels, such as hypothyroidism and hyperthyroidism, have been implicated in the development and progression of numerous systemic diseases. One significant area of interest is the relationship between thyroid disturbance and ischemic heart disease (IHD) [4,5].

Ischemic heart disease, characterized by reduced blood flow to the heart muscle due to coronary artery narrowing or blockage, is a leading cause of morbidity and mortality worldwide. The pathogenesis of IHD involves the formation of atherosclerotic plaques in the coronary arteries, leading to reduced oxygen and nutrient supply to the myocardium [6]. Various risk factors, including hypertension, dyslipidemia, smoking, and diabetes, have been extensively studied in the context of IHD. However, emerging evidence suggests that thyroid dysfunction may also contribute to the development and progression of IHD [7].

Both hypothyroidism and hyperthyroidism have been associated with an increased risk of IHD, although the mechanisms underlying this association are not fully understood. Hypothyroidism, characterized by low levels of thyroid hormones, has been linked to dyslipidemia, endothelial dysfunction, impaired cardiac contractility, and increased systemic vascular resistance, all of which can promote the development of atherosclerosis and IHD [8]. On the other hand, hyperthyroidism, characterized by excessive thyroid hormone production, has been associated with increased heart rate, cardiac output, and arterial stiffness, potentially contributing to increased cardiac workload and susceptibility to cardiac ischemia [9].

Numerous epidemiological studies have explored the association between thyroid dysfunction and IHD, but the findings have been inconsistent. Some studies have reported a positive association between thyroid dysfunction and IHD risk, while others have found no significant relationship. The heterogeneity of the study populations, variations in the definition and classification of thyroid dysfunction, and differences in study design and methodology contribute to the conflicting results [10]. Understanding the relationship between thyroid disturbance and IHD is crucial for optimizing risk assessment, management, and preventive strategies for individuals with thyroid dysfunction. Elucidating the mechanisms underlying this association can provide insights into the pathophysiology of IHD and guide the development of targeted therapies [7].

The aim of this study was to evaluate the potential association between thyroid dysfunction and ischemic heart disease (IHD) and examine the prevalence of thyroid dysfunction among patients with IHD and explores the relationship between thyroid hormone levels and cardiovascular risk factors.

Patients and Methods.

Study design: The current study is case-control study conducted in Baghdad city during the period between on 1st of January to the end of 2023. patients admitted to Coronary Care Unit of Ibn Al Nafees hospital and Ibn Al Bitar Hospital And Alyarmok Hospital in Baghdad city.

Patients: The study included 60 Iraqi patients with coronary heart disease with age range (37-66 years). The diagnosis of ischemic heart disease was based on history and characteristic electrocardiographic changes. Hypertension, defined as a systolic blood pressure greater than 130 mmHg or a diastolic

blood pressure greater than 80 mmHg or are taking medication for hypertension. Medical history was taken for patients including history of hypertension and/or diabetes mellitus in addition to drug history and smoking.

Control group: A control group of 30 apparently healthy individuals (15 men and 15 females) was used, were matched with patients in terms of gender and age to improve the accuracy of the results. They were obtained from our families and friends and health workers. They were had a normal thyroid and lipids and HbA1c functions test.

Exclusion Criteria: Patients using drugs like corticosteroids, amiodarone, and on thyroid or anti-thyroid drugs regularly. Patients receiving any iodinated contrast agent within the previous 2 weeks. Patients with a history of established diseases such as malignancy, chronic renal diseases, COPD (chronic obstructive pulmonary disease), liver disease, or psychiatric disease. Patients with an active infection or any conditions known to affect the profile of thyroid function. Patients with hypertension who are on beta-blockers and have type I diabetes mellitus. Patients with a history of thyroid disease.

Results.

The study found that 26.67% of IHD patients were smokers, while the majority (73.33%) were non-smokers. 60% had hypertension, and 58.33% had diabetes, indicating a high prevalence of diabetes among individuals with IHD. Smoking is a prevalent risk factor (Table 1).

Table (2) compares thyroid hormone status between IHD patients and the control group. IHD patients had significantly higher T3 levels (1.701 ± 1.21) nmol/L than the control group (0.87 ± 0.16), suggesting potential differences. T4 levels were significantly higher in IHD patients (118.63 ± 75.7) nmol/L, indicating a substantial difference between the two groups. TSH levels were significantly lower in IHD patients (2.23 ± 1.17) uIU/mL, indicating a significant difference between the two groups.

Table (3) shows the prevalence of thyroid dysfunction among patients with ischemic heart disease (IHD). Of these patients, 53.33% had normal thyroid function, while 46.67% had thyroid dysfunction, compared to 3.33% of healthy control individuals. This indicates a significant association between thyroid dysfunction and ischemic heart disease, with the odds ratio of 24.75 times higher in IHD patients compared to healthy control individuals.

Figure (1) displays the types of thyroid dysfunction observed among patients with ischemic heart disease (IHD). The figure indicates that among the IHD patients with thyroid dysfunction, 39.29% (11 individuals) had hyperthyroidism, while 60.71% (17 individuals) had hypothyroidism. This finding highlights that hypothyroidism is the more prevalent form of thyroid dysfunction among IHD patients, affecting a majority of those with thyroid abnormalities.

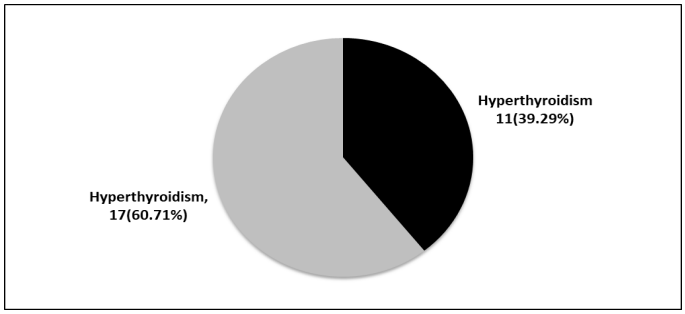

Figure 1. *Types of thyroid dysfunction among IHD patients.*

Table 1. *Distribution of IHD patients according to associated to smoking, hypertension and diabetes.*

Associated factors	**IHD patients**	
Smoking	Count	Percent
yes	16	26.67 %
no	44	73.33 %
Total	60	100 %
Hypertension		
yes	36	60 %
no	24	40 %
Diabetes		
yes	35	58.33 %
no	25	41.67 %

Table 2. *Thyroid hormones levels among IHD patients and the control group.*

Thyroid function (mean±SD)	**IHD patients (n=60)**	**Control group (n=30)**	**p value**
T3 nmol/L	1.701±1.21	0.87±0.16	0.015
T4 nmol/L	118.63±75.7	78.5±13.65	0.001
TSH uIU/mL	2.23±1.17	3.18±2.078	0.018

Table 3. *Prevalence of thyroid dysfunction among IHD patients.*

Studied groups	**Thyroid dysfunction**	**Euthyroid**	**Total**
IHD	28(46.67%)	32(53.33%)	60(100%)
Control	1(3.33%)	29(96.67%)	30(100%)
Odds Ratio = (a * d) / (b * c) = (28 * 29) / (32 * 1) ≈ 24.75			

Table 4. *Comparison of IHD patients with thyroid dysfunction and euthyroidism with control group regarding thyroid function parameters.*

Thyroid function (mean±SD)	**IHD patients with thyroid dysfunction (n:28)**	**Control group (n:30)**	**P-value**
T3 nmol/L	1.89±1.21	0.87±0.16	0.011
T4 nmol/L	106.7±86.5	78.5±13.65	0.016
TSH uIU/mL	3.29±2.55	3.18±2.078	0.13
Thyroid function (mean±SD)	Euthyroidism IHD patients (n:32)	Control group (n:30)	P-value
T3 nmol/L	1.16±0.54	0.87±0.16	0.17
T4 nmol/L	94.8±63.7	78.5±13.65	0.12
TSH uIU/mL	2.89±0.85	3.18±2.078	0.13

In Table (4) the T3 levels in IHD patients with thyroid dysfunction (1.89±1.21) nmol/L were significantly higher compared to the control group (0.87±0.16) with a p-value of 0.011. Similarly, the T4 levels were also significantly higher in IHD patients with thyroid dysfunction (106.7±86.5) nmol/L compared to the control group (78.5±13.65) with a p-value of 0.016. On the other hand, the TSH levels did not show a significant difference between IHD patients with thyroid dysfunction (3.29±2.55) uIU/mL and the control group (3.18±2.078), with a p-value of 0.13. While The thyroid hormone levels (T3, T4, and TSH) were compared between euthyroidism IHD patients and the control group. The results show that there were no significant differences in T3, T4, and

TSH levels between euthyroidism IHD patients and the control group.

The study suggests that there were no significant differences in thyroid function parameters among the different age groups of individuals with hypothyroidism. Among the 40-49 age group, the mean T3 level was 0.49±0.02 nmol/L, the mean T4 level was 43.5±0.7 nmol/L, and the mean TSH level was 4.88±0.38. For the 50-59 age group (n=5), the mean T3 level was 0.36±0.17 nmol/L, the mean T4 level was 44.6±0.54 nmol/L, and the mean TSH level was 5.41±1.07 uIU/mL. In the >59 age group (n=10), the mean T3 level was 0.51±0.03 V, the mean T4 level was 45.8±6.9 nmol/L, and the mean TSH level was 5.24±0.66 uIU/mL (Table 5).

The study suggests that there were no significant differences in thyroid function parameters among the different age groups of individuals with hyperthyroidism. For the 40-49 age group (n=0), no data is provided for thyroid function parameters, so no conclusions can be drawn for this age group. In the 50-59 age group, the mean T3 level was 3.91±0.41 nmol/L, the mean T4 level was 207.7±51.7 nmol/L, and the mean TSH level was 0.23±0.09 uIU/mL. In the >59 age group, the mean T3 level was 4.19±0.42, the mean T4 level was 196.9±53.1 nmol/L, and the mean TSH level was 0.27±0.05 uIU/mL (Table 6).

In the hypothyroidism group, there were 6 males and 11 females. The mean T3 level in males was 0.51±0.08 nmol/L, while in females it was 0.46±0.12 nmol/L. The mean T4 level in males was 44.1±0.47 nmol/L, and in females it was 42.6±0.69 nmol/L. The mean TSH level in males was 5.38±0.39 uIU/mL, and in females it was 4.61±0.98 uIU/mL. The p-values for T3, T4, and TSH indicate that there were no statistically significant differences based on sex in the hypothyroidism group. In the hyperthyroidism group, there were 5 males and 6 females. The mean T3 level in males was 4.41±0.46 nmol/L, and in females it was 3.89±0.61 nmol/L. The mean T4 level in males was 199.5±50.6 nmol/L, and in females it was 206.4±53.1 nmol/L. The mean TSH level in males was 0.25±0.09 uIU/mL, and in females it was 0.26±0.11 uIU/mL. The p-values for T3, T4, and TSH also indicate that there were no statistically significant differences based on sex in the hyperthyroidism group (Table 7).

Table 5. *Comparison of thyroid functions in IHD Patients with hypothyroidism in regards to age groups.*

Hypothyroidism (n:17) In IHD	**Age groups (years)**	**No.**	**Thyroid function (mean±SD)**		
			T3 nmol/L	**T4 nmol/L**	**TSH uIU/mL**
	40-49	2	0.49±0.02	43.5±0.7	4.88±0.38
	50-59	5	0.36±0.17	44.6±0.54	5.41±1.07
	>59	10	0.51±0.03	45.8±6.9	5.24±0.66
P-value			0.12	0.25	0.13

Table 6. *Comparison of thyroid functions in IHD Patients with hyperthyroidism in regards to age groups.*

Hyperthyroidism (n:11)	**Age groups (years)**	**No.**	**Thyroid function (mean±SD)**		
			T3 nmol/L	**T4 nmol/L**	**TSH uIU/mL**
	40-49	0	0	0	0
	50-59	5	3.91±0.41	207.7±51.7	0.23±0.09
	>59	6	4.19±0.42	196.9±53.1	0.27±0.05
P-value			0.16	0.18	0.15

Table 7. *Comparison of thyroid function in hypothyroidism and hyperthyroidism patients in regards to sex.*

Studied groups	**Sex**		**Thyroid function (mean±SD)**		
		No.	**T3**	**T4**	**TSH**
Hypothyroidism (n:17)	Males	6	0.51±0.08	44.1±0.47	5.38±0.39
	Females	11	0.46±0.12	42.6±0.69	4.61±0.98
P-value			0.09	0.16	0.18
Hyperthyroidism (n:11)	Males	5	4.41±0.46	199.5±50.6	0.25±0.09
	Females	6	3.89±0.61	206.4±53.1	0.26±0.11
P-value			0.16	0.18	0.19

Discussion.

In the current study, it was found that a significant proportion of individuals diagnosed with ischemic heart disease (IHD) were smokers. Approximately 26.67% of IHD patients were identified as smokers, while the majority, accounting for 73.33% of the patients, were non-smokers. These findings highlight the significant association between smoking and the development of IHD. Smoking is a well-established and prevalent risk factor for cardiovascular diseases, including IHD [11,12]. The harmful chemicals present in tobacco smoke can damage the blood vessels, increase inflammation, promote the formation of blood clots, and contribute to the narrowing of arteries, all of which can lead to the development of IHD [13-15].

Numerous studies have consistently demonstrated that smoking is a potent risk factor for individuals with ischemic heart disease (IHD) [16,17]. The association between smoking and cardiovascular disease, including IHD, is well-established [18].

Moreover, the study also revealed a high prevalence of hypertension among individuals with IHD. Approximately 60% of the IHD patients had hypertension, indicating the close relationship between high blood pressure and the development of IHD. Hypertension places additional strain on the heart and blood vessels, leading to increased risk of heart disease, including IHD. Furthermore, the study identified that 58.33% of the IHD patients had diabetes. This finding suggests a high prevalence of diabetes among individuals with IHD. Diabetes is a metabolic disorder characterized by elevated blood sugar levels, and it is associated with an increased risk of cardiovascular complications. Individuals with diabetes are more prone to developing heart diseases, including IHD, due to the detrimental effects of high blood sugar on the blood vessels and the heart [19].

Numerous studies have consistently demonstrated that diabetes significantly increases the risk of developing CHD, with the risk being higher in diabetic women compared to diabetic men [20,21]. Diabetes can exert detrimental effects on blood vessels, predisposing individuals to the development of atherosclerosis. Atherosclerosis refers to the accumulation of plaque in the arteries, which can restrict blood flow and lead to the occurrence of heart attacks and other cardiovascular events. The damage caused by diabetes to blood vessels, along with other metabolic abnormalities associated with the condition, contributes to the heightened risk of developing CHD [22].

These findings highlight the high prevalence of thyroid dysfunction among IHD patients, with a substantial proportion of individuals exhibiting either hyperthyroidism or hypothyroidism. Thyroid dysfunction can have significant

implications for cardiovascular health, as both hyperthyroidism and hypothyroidism can impact various aspects of cardiovascular function and increase the risk of cardiovascular complications [23,24]. In line with our finding, Grais and Sowers [25] found that hypothyroidism is the more prevalent form of thyroid dysfunction among IHD patients, affecting a majority of those with thyroid abnormalities. Moreover, Al-Shibani [25] showed that changes in thyroid hormone profile were observed in most of cardiovascular patients, 35% had subclinical hypothyroidism and 23% had subclinical hyperthyroidism. The study conducted by Qari FA on 400 patients with acute coronary syndrome (ACS) reported a change in thyroid hormone profiles in 23.3% of the patients [26,27]. Another study by Mathur et al [28] involving 85 patients with ACS reported changes in thyroid hormone profiles in 31.7% of the patients.

In comparison to these previous studies, our study observed a higher prevalence of thyroid dysfunction. This difference could be attributed to several factors, including variations in sample size, different inclusion criteria, and the specific patient population in our study conducted in Iraq. It is worth noting that the previous studies were conducted within healthy programs, with annual examinations, whereas our study focused specifically on patients with ischemic heart disease (IHD). Additionally, factors unique to our country, such as accidental radiation exposure in the environment, increased major stressful conditions, smoking, iodine status, and the use of certain drugs and herbal remedies that can affect thyroid hormones, may have influenced the higher prevalence of thyroid dysfunction [29]. In addition, in contrast to these studies, Adawiyah et al. [30] reported a prevalence of 53% of thyroid hormone dysfunction among 85 patients in their study. The higher prevalence observed in their study is more comparable to the results of our study, which may be attributed to the smaller number of patients included in their study.

Thyroid hormone dysfunction significantly affects the cardiovascular system, as the changes in thyroid hormone secretion can impact heart muscle contractility, heart rate, and peripheral circulation hemodynamics [31]. Hypothyroidism, even in its subclinical form, can contribute to signs of coronary heart disease and may even lead to death, particularly when the thyroid-stimulating hormone (TSH) levels exceed 10 μIU/l [32,33]. The thyroid gland exerts significant effects on various body tissues, but its impact on the cardiovascular system and kidney is particularly noteworthy. Abnormalities in thyroid gland morphology and dysfunction are associated with diabetes, while low T3 syndrome is linked to chronic kidney disease [34]. Hyperthyroid secretions can lead to increased cardiac preload, cardiac output, arterial stiffness, and systolic blood pressure. This can result in left ventricular hypertrophy and, in severe cases, diastolic dysfunction and heart failure. Hyperthyroidism is also associated with an increased risk of pulmonary hypertension, with sinus tachycardia being the most common rhythm alteration. Atrial fibrillation is considered the most clinically significant arrhythmia associated with hyperthyroidism [35].

In our study, we observed statistically significant differences in the prevalence of thyroid dysfunction between the age groups of >50 years. In study done by Al-Shibani [25] showed that, there is statistically significant differences of thyroid dysfunction between age groups>60years and 40-60years. A study by Bayrak et al [36], involving 100 patients with acute coronary syndrome (ACS), also reported a higher prevalence of abnormal thyroid hormones in the age group >60 years. This can be attributed to several factors. Firstly, thyroid diseases tend to increase with age, and they are more likely to remain undiagnosed in older individuals due to the presentation of nonspecific symptoms such as mild cognitive impairment, constipation, diarrhea, anemia, fatigue, and sweating. In contrast, thyroid diseases in the age group of >50 years often present with overt symptoms of the disease [37]. Additionally, the aging process itself is associated with physiological changes that can affect the results of thyroid function tests. Furthermore, the presence of chronic non-thyroidal illness and the use of medications that can interfere with thyroid function tests are common in elderly individuals, and some patients may not disclose this information during the history-taking process [38,39].

Conclusion.

Thyroid dysfunction is observed in a significant proportion of IHD patients, with both hypo- and hyperthyroidism being present. Hypothyroidism is the more prevalent form of thyroid dysfunction among IHD patients, affecting a majority of those with thyroid abnormalities. The prevalence of thyroid dysfunction is higher in IHD patients compared to the healthy control group, indicating a potential relationship between thyroid dysfunction and the presence of IHD.

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