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Study of Thyroid Function in Rheumatoid Arthritis Cases Admitted in A Tertiary Care Center

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Abstract

Background: Rheumatoid arthritis (RA) is a chronic and systemic autoimmune disease that causes persistent inflammatory polyarthritis and joint degradation, limiting mobility and increasing disability.1 The frequency of RA in the general population is about 1%, and it has been linked to a number of co-morbidities.2 The aetiology of RA is still unknown, and both genetic and environmental variables have a role in the disease's development.3 Despite the clinical implications of RA, patients with the condition are more likely to develop co-morbidities, such as cardiovascular disease (CVD) **Aim & Objective:** 1.Study of thyroid function in rheumatoid arthritis cases.2. Study prevalence of thyroid disorder among RA factor positive patients. **Methods:** A Cross sectional study. Study setting: Department of Physiology Grant Government medical college, Mumbai. Study duration: 1 year (5/08/19 to 4/08/20)

Study population: A total of 100 RA patients were recruited from the Outpatient and Inpatient department of Medicine at Grant Government medical college, Mumbai during study period 5/08/19 to 4/08/20 **Sample size:** 100 **Results:** Most of cases found in above 60 years age group 70 cases followed by 38 cases in 46 to 60 years age group, 24 cases in 31 to 45 years age group and 8 cases in 18 to 30 age group, most of cases were females 82 and 18 males, majority cases presented with Subclinical hypothyroidism 12 cases followed by Hyperthyroidism 8 cases and Hypothyroidism 3 cases, HTN 10 cases, DM 5 cases, 2 cases presented with COPD. **Conclusions:** Most of cases found in above 60 years age group, most of cases were females, majority cases presented with Subclinical hypothyroidism

Keywords: Rheumatoid arthritis, Subclinical hypothyroidism, Hyperthyroidism, Hypothyroidism.

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Introduction

Rheumatoid arthritis (RA) is a chronic and systemic autoimmune disease that causes persistent inflammatory polyarthritis and joint degradation, limiting mobility and increasing disability [1].The frequency of RA in the general population is about 1%, and it has been linked to a number of co-morbidities [2] The aetiology of RA is still unknown, and both genetic and environmental variables have a role in the disease's development [3] Despite the clinical implications of RA, patients with the condition are more likely to develop co-morbidities, such as cardiovascular disease (CVD)[4].

ISSN: 0975-3583,0976-2833 VOL12, ISSUE 09, 2023

The mechanism underlying the higher risk of co-morbidities in RA patients is unknown, but researchers tend to blame it on the disease's inflammatory state [5]. Hyperthyroidism and hypothyroidism are the most common forms of thyroid malfunction. Overt and subclinical stages of hyperthyroidism and hypothyroidism can be distinguished [6]. Graves' disease (GD) is the most common cause of hyperthyroidism, which is defined by an excess of thyroid hormones.

Insufficiency of thyroid hormones is hypothyroidism, and Hashimoto's thyroiditis is the most prevalent cause (HT). Hyperthyroidism and hypothyroidism both have a negative influence on human health and can increase the risk of cardiovascular disease and death.
Thyroid dysfunction was found to be common in RA patients in previous research, with frequency ranging from 6 to 34 percent [7].

Thyroid function testing is frequently advised for people who have symptoms including cold intolerance, weight loss, high metabolism, or thyroid goiter [8]. Furthermore, some guidelines recommend that individuals with type 1 diabetes or Addison's disease have thyroid-related testing because they are at a higher risk of thyroid malfunction [9]. In RA patients, however, a typical thyroid function test is not indicated.

Thyroid dysfunction is a concern that has yet to be thoroughly proven in RA patients. In this study, we used a case-control design to assess the prevalence and risk of thyroid dysfunction in RA patients. To fully clarify the link between RA and thyroid dysfunction, a systematic review and meta-analysis were done.

Aim and objective

1. Study of thyroid function in rheumatoid arthritis cases.
2. Study prevalence of thyroid disorder among RA factor positive patients.

Methodology

Study design: A Cross sectional study

Study setting: Department of Physiology Grant Government medical college, Mumbai

Study duration: 1 year (5/08/19 to 4/08/20)

Study population: A total of 100 RA patients were recruited from the Outpatient and Inpatient department of Medicine at Grant Government medical college, Mumbai during study period 5/08/19 to 4/08/20

Inclusion criteria:

1. All cases confirmed diagnosis with Rheumatoid arthritis

Exclusion criteria:

1. Patients with provisional diagnosis of RA
2. Not willing to participate

Approval for the study:

Written approval from Institutional Ethics committee was obtained beforehand. Written approval of Physiology and Medicine department was obtained. After obtaining informed verbal consent from all patients with the definitive diagnosis of RA admitted in Medicine department of Grant Government medical college, Mumbai such cases were included in the study.

Sample size: 100

Sampling technique: Convenient sampling technique used for data collection. All patients admitted in Medicine department of Grant Government medical college, Mumbai such cases were included in the study.

Methods of Data Collection and Questionnaire-

Predesigned and pretested questionnaire was used to record the necessary information. Questionnaires included general information, such as age, sex, religion,

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occupation, residential address, socioeconomic status and date of admission .Medical history-chief complain, past history, general examination, systemic examination

Study procedure:

A total of 100 RA patients were recruited from the Outpatient and Inpatient department of Medicine at Grant Government medical college, Mumbai during study period 5/08/19 to 4/08/20

The American Rheumatology Association classification standards were used to examine all of the patients [10]. Individuals with a history of other rheumatic disorders were among those who were excluded.

In addition, a thorough examination was carried out, with a focus on thyroid dysfunction symptoms and test markers. Sex, age, disease duration, treatment techniques, C-reactive protein (CRP), rheumatoid factor (RF), anti-cyclic citrullinated peptide antibody (anti-CCP), and other factors were all gathered. Co-morbidities like hypertension and type 2 diabetes mellitus (T2DM) were also recorded.

In addition, the levels of free triiodothyronine (FT3), free thyroxine (FT4), and circulating thyroid stimulating hormone (TSH) were measured, as well as ultrasound examination and/or diffuse goitre. Thyroid dysfunction was defined as hyperthyroidism (clinical or subclinical) or hypothyroidism based on a combination of thyroid hormones and clinical symptoms (clinical or subclinical).

Subclinical hyperthyroidism was described as a lowered TSH level with a normal FT4 level, whereas overt hyperthyroidism was classified as a decreased TSH level with an elevated FT4 level. Overt hypothyroidism was described as having a high TSH level and a low FT4 level, whereas subclinical hypothyroidism (SCH) was defined as having a high TSH level but a normal FT4 level. TSH, FT, and FT4 had reference values of 0.27–4.2 mIU/L, 3.1–6.8 pmol/L, and 12.0–22.0 pmol/L, respectively.

Data Analysis

The data were entered in Microsoft Excel and data analysis was done by using SPSS demo version no 21 for windows. The analysis was performed by using percentages in frequency tables. $p<0.05$ was considered as level of significance using the Chi-square test.

Results And Observations

Table No. 1: Distribution of cases according to age (N=100)

Age in years	Frequency	Percentage
18-30	08	8%
31-45	24	24%
46- 60	38	38%
>60	70	70%
Total	100	100 (100%)

The above table shows most of cases found in above 60 years age group 70 cases followed by 38 cases in 46 to 60 years age group, 24 cases in 31 to 45 years age group and 8 cases in 18 to 30 age group

ISSN: 0975-3583,0976-2833 VOL12, ISSUE 09, 2023

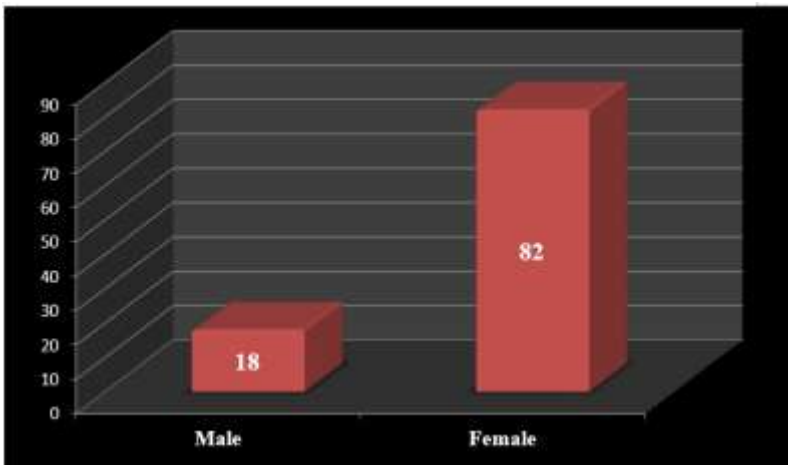

Figure no: 1 Distribution of cases as per sex (N-100)

The above figure shows most of cases were females 82 and 18 males

Table No. 2: Prevalence of thyroid dysfunction among RA

Thyroid dysfunction	Frequency	Percentage
Hyperthyroidism	08	8%
Hypothyroidism	03	3%
Subclinical hypothyroidism	12	12%
Total	23	23 (23%)

The above table shows majority cases presented with Subclinical hypothyroidism 12 cases followed by Hyperthyroidism 8 cases and Hypothyroidism 3 cases.

Table no.3: Mean and SD value of Thyroid dysfunction

Thyroid dysfunction	N=23	T3	T4	TSH
Hyperthyroidism	08	5.22±2.10	15.24±2.11	0.021±0.01
Hypothyroidism	03	0.45±0.00	0.96±000	17.24±0.00
Subclinical hypothyroidism	12	3.45±0.56	1.22±0.23	6.45±1.32

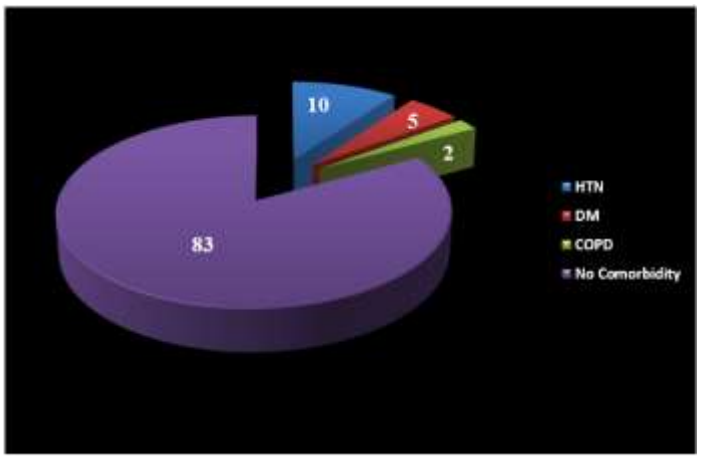

Figure no: 2 Distribution of cases as per comorbidity

The above figure shows majority of cases with no comorbidity 83 cases followed by HTN 10 cases, DM 5 cases, 2 cases presented with COPD.

ISSN: 0975-3583,0976-2833 VOL12, ISSUE 09, 2023

Discussion

The current cross sectional study conducted in Physiology department of Grant Government medical college, Mumbai during study period 5/08/19 to 4/08/20.Rheumatoid arthritis (RA) is a chronic and systemic autoimmune disease that causes persistent inflammatory polyarthritis and joint degradation, limiting mobility and increasing disability [1].The frequency of RA in the general population is about 1%, and it has been linked to a number of comorbidities [2]

The aetiology of RA is still unknown, and both genetic and environmental variables have a role in the disease's development [3] Despite the clinical implications of RA, patients with the condition are more likely to develop co-morbidities, such as cardiovascular disease (CVD)[4].

RA patients have a higher prevalence of thyroid dysfunction, and RA is a significant risk factor for thyroid dysfunction. Thyroid dysfunction, particularly overt hypothyroidism, is more common in RA patients

In current study Most of cases found in above 60 years age group 70 cases followed by 38 cases in 46 to 60 years age group, 24 cases in 31 to 45 years age group and 8 cases in 18 to 30 age group similar result found in the study conducted by Li et al [1] he reported that the majority of cases found above 50 years age group.

In present study most of cases were females 82 and 18 males similar result observed in the study conducted by Elattar et al [11] he reported that the majority cases were females 78%.

In current study majority cases presented with Subclinical hypothyroidism 12 cases followed by Hyperthyroidism 8 cases and Hypothyroidism 3 cases. Primary hypothyroidism was shown to be the most frequent thyroid malfunction in RA patients, followed by subclinical hypothyroidism, according to Elattar et al [11]

Other research has also found a link between RA and thyroid antibodies. When RA patients were compared to the control group, Andonopoulos et al. found a difference in the amount of thyroid autoantibodies [12] Thyroid autoantibodies are substantially more prevalent in RA patients than in the general population, according to Acay et al[13] Thyroid disease and rheumatoid arthritis are both autoimmune diseases, thus their origins could be comparable.

The actual mechanism, however, is still unknown. The link between RA and thyroid dysfunction is thought to be mediated by hereditary and environmental factors [14] Thyroid function should be assessed in people with RA since RA medication can aggravate thyroid abnormalities.

High dosages of glucocorticoids, which are commonly used to treat inflammation in RA patients, can cause direct inhibition of TSH secretion without raising FT3 or FT4 [15] Thyroid function may also be affected by another medication, leflunomide[14] As a result, several studies have proposed that thyroid screening should be done routinely in RA patients [16]

Conclusions

Most of cases found in above 60 years age group, most of cases were females, majority cases presented with Subclinical hypothyroidism

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ISSN: 0975-3583,0976-2833 VOL12, ISSUE 09, 2023

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