



MUSCULOSKELETAL MANIFESTATIONS IN PATIENTS WITH THYROID DISORDERS: A HOSPITAL-BASED CROSS-SECTIONAL STUDY FROM JAMMU, INDIA

Rheumatology

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ABSTRACT

Thyroid dysfunction affects bone, muscle and periarticular soft tissues, but data on its musculoskeletal (MSK) manifestations from Jammu and Kashmir are lacking. This hospital-based cross-sectional study, conducted at Government Medical College, Jammu, from May 2024 to April 2025, included 149 adults with thyroid disorders; patients with diabetes mellitus and other conditions causing MSK disease were excluded. Adhesive capsulitis, limited joint mobility (LJM), trigger finger, Dupuytren's contracture and carpal tunnel syndrome were assessed using standard clinical criteria, and serum fT3, fT4 and TSH were measured. The mean age was 44.2 ± 16.1 years and 79.2% were women. Overt hypothyroidism was present in 123 (82.6%), subclinical hypothyroidism in 15 (10.1%) and hyperthyroidism in 11 (7.4%) patients. LJM was seen in 6.0%, adhesive capsulitis in 4.7%, trigger finger and Dupuytren's contracture in 2.0% each, and carpal tunnel syndrome in 1.3% of patients. All cases occurred in overt hypothyroidism, although differences between groups were not statistically significant. Patients with overt hypothyroidism should be screened for periarticular MSK disorders.

KEYWORDS

Hypothyroidism; Adhesive Capsulitis; Limited Joint Mobility; Carpal Tunnel Syndrome

INTRODUCTION

Thyroid disorders are among the commonest endocrine diseases, with hypothyroidism the most prevalent form and women disproportionately affected (Taylor et al., 2018). Thyroid hormones act on bone, skeletal muscle and connective tissue, and hypothyroidism causes glycosaminoglycan deposition in periarticular tissues, tendon sheaths and perineurium. This is thought to underlie adhesive capsulitis (AC), limited joint mobility (LJM), trigger finger (TF), Dupuytren's contracture (DC) and carpal tunnel syndrome (CTS), which may mimic primary rheumatological disease (Gupta et al., 2020).

Reported frequencies vary widely. Cakir et al. (2003) found AC most often in subclinical thyrotoxicosis and DC, LJM and CTS mainly in hypothyroidism. Indian studies have reported MSK symptoms in about three-quarters of hypothyroid patients (Kole et al., 2013; Pillai et al., 2009), and thyroid disease is an established risk factor for AC (Chuang et al., 2023; Huang et al., 2014). However, no data are available from Jammu and Kashmir. We therefore studied the frequency and pattern of MSK manifestations in adults with thyroid disorders and their relation to thyroid functional status.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Medicine and Endocrinology outpatient departments of Government Medical College, Jammu, from 1 May 2024 to 30 April 2025, after approval by the Institutional Ethics Committee. Written informed consent was obtained from all participants. Assuming a prevalence of 11%, 95% confidence and a 5% margin of error, the minimum sample size (Epi Info 7.0) was 148; 149 patients were enrolled.

Consecutive adults (>18 years) with thyroid disorders and abnormal thyroid function at the initial visit were included. Patients with diabetes mellitus, alcoholism, chronic liver or kidney disease, connective tissue disorders, local trauma, myocardial infarction, hemiplegia, malignancy or epilepsy were excluded. Patients were classified by clinical diagnosis and thyroid hormone levels. Serum fT3, fT4 and TSH were measured by chemiluminescence immunoassay.

All patients completed a standardized symptom questionnaire and

underwent neurological and MSK examination. AC was defined as shoulder pain for at least one month, inability to lie on the affected shoulder, and restriction of passive abduction, internal and external rotation (Pal et al., 1986). LJM was defined as inability to approximate the palmar surfaces of the fingers in the prayer position (Rosenbloom et al., 1981). DC was diagnosed by palmar or digital nodules, skin tethering, a pretendinous band or digital contracture (Noble et al., 1984); TF by locking or catching of a digit on flexion; and CTS by median nerve symptoms with a positive Tinel's or Phalen's test.

Data were analysed using jamovi 2.6.26. Hormone levels were compared using Welch's one-way ANOVA and categorical variables using the chi-square or Fisher's exact test. A p-value <0.05 was considered significant.

RESULTS

Of 149 patients, 118 (79.2%) were women. The mean age was 44.2 ± 16.1 years; men were older than women (51.0 ± 15.4 vs 42.4 ± 15.9 years; $p = 0.008$). No patient had subclinical hyperthyroidism. Sex distribution did not differ across diagnoses, whereas thyroid hormone levels differed significantly (Table 1).

Table 1: Characteristics of patients by thyroid diagnosis

Parameter	Overt hypothyroid (n = 123)	Subclinical hypothyroid (n = 15)	Hyperthyroid (n = 11)	p-value
Female, n (%)	95 (77.2)	14 (93.3)	9 (81.8)	0.341
TSH (μ IU/mL)	9.30 ± 9.54	7.11 ± 1.41	0.61 ± 0.53	<0.001
fT3 (pg/mL)	2.36 ± 0.67	2.61 ± 0.47	3.98 ± 0.64	<0.001
fT4 (ng/dL)	1.05 ± 0.31	1.16 ± 0.23	1.61 ± 0.45	0.002

Values are mean $\pm$ SD unless stated.

LJM was the commonest manifestation, followed by AC. All MSK manifestations occurred in patients with overt hypothyroidism, with none in the subclinical hypothyroid or hyperthyroid groups (Table 2). Shoulder pain for at least one month was reported in 16 (10.7%) right and 12 (8.1%) left shoulders. AC affected 3 of 31 men (9.7%) and 4 of 118 women (3.4%) ($p = 0.157$).

Table 2: Musculoskeletal manifestations by thyroid diagnosis, n (%)

Manifestation	Overt hypothyroid (n = 123)	Subclinical hypothyroid (n = 15)	Hyperthyroid (n = 11)	Total (n = 149)	p-value
Limited joint mobility	9 (7.3)	0	0	9 (6.0)	0.802
Adhesive capsulitis	7 (5.7)	0	0	7 (4.7)	1.000
Trigger finger	3 (2.4)	0	0	3 (2.0)	1.000
Dupuytren's contracture	3 (2.4)	0	0	3 (2.0)	1.000
Carpal tunnel syndrome	2 (1.6)	0	0	2 (1.3)	1.000

p-values by Fisher's exact test.

DISCUSSION

In this study, periarticular MSK manifestations, chiefly LJM and AC, were confined to patients with overt hypothyroidism. The female predominance and mean age of our cohort resemble earlier studies (Cakir et al., 2003; Pillai et al., 2009; Sayadi et al., 2024), as does the predominance of hypothyroidism (83% in Sayadi et al., 2024).

AC was present in 5.7% of hypothyroid patients, lower than the 10.9% reported by Cakir et al. (2003) and 12.5% by Sayadi et al. (2024), but close to the 6.8% of Pillai et al. (2009). The association appears bidirectional, as hypothyroidism is more prevalent in patients with frozen shoulder (Schiefer et al., 2017). LJM was seen in 7.3% of hypothyroid patients, compared with 4.4% (Cakir et al., 2003) and 33.5% (Pillai et al., 2009) in earlier series. Because LJM and AC are strongly associated with diabetes (Pal et al., 1986; Rosenbloom et al., 1981), excluding diabetic patients probably lowered our frequencies but strengthens their attribution to thyroid dysfunction.

CTS was uncommon (1.6% of hypothyroid patients) compared with 9.5% (Cakir et al., 2003) and 16.7% (Karne & Bhalerao, 2016), probably because diagnosis relied on clinical tests without nerve conduction studies. The absence of cases in subclinical hypothyroidism and hyperthyroidism should be interpreted cautiously, as these groups were small and hyperthyroidism is a recognised risk factor for AC (Huang et al., 2014).

This study was single-centre and cross-sectional, without a euthyroid control group, and disease duration, treatment status and thyroid autoantibodies were not analysed. Nevertheless, it used standardized criteria, excluded major confounders and provides the first data on this subject from Jammu and Kashmir.

CONCLUSION

MSK manifestations, predominantly LJM and AC, occurred only in patients with overt hypothyroidism. Hypothyroid patients should be screened for these disorders, and thyroid function should be checked in patients presenting with them. Larger multicentre studies with euthyroid controls are needed.

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