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Original Research

Bone and joint manifestations in 25 hypothyroidism patients: A case series

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ABSTRACT:
Background: Hypothyroidism is frequently accompanied by musculoskeletal manifestations. Musculoskeletal symptoms associated with thyroid dysfunction include muscle weakness and pain, TM joint swelling and arthralgia, carpal tunnel syndrome and other neuropathic pains, and fibromyalgia-like complaints. Hence; in the present research, we aim to summarize the bone and joint manifestations in 25 hypothyroidism patients. **Materials & methods:** A Performa was made and complete medical history of all the patients was recorded. Blood samples were obtained and serum analysis was done. Radiographic investigations were carried out. On a separate Performa, bone and joint manifestations were recorded. All the results were summarized in Microsoft excel sheet and were analysed by SPSS software. **Results:** Mean age of the patients was 34.5 years. 60 percent of the patients were males while the remaining were females. Positive family history of thyroid dysfunction was seen in 16 percent of the patients. Epiphyseal dysgenesis, Slipped capital femoral epiphysis, Aseptic necrosis, Pseudogout/Gout, Erosive osteoarthritis, Epiphyseal dysgenesis and slipped capital femoral epiphysis were seen in 60 percent, 52 percent, 40 percent, 32 percent, 24 percent, 16 percent, 20 percent and 12 percent of the patients respectively. **Conclusion:** Thyroid hormones are essential for skeletal development and are important regulators of bone maintenance in adults. Hypothyroidism is frequently associated with bone and joint manifestation.
Key words: Hypothyroidism, Bone, Joint

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INTRODUCTION

Hypothyroidism is frequently accompanied by musculoskeletal manifestations ranging from myalgias and arthralgias to true myopathy and arthritis. Most cases of arthropathic changes in adult-recognized hypothyroidism involved the knees and hands, while the hip and the epiphysis of the femoral head appear more commonly involved in children. Thyroid hormones have known effects at the cellular level on proliferation and differentiation of bone and cartilage.[1- 3]

The hypothyroid state appears to induce abnormalities in these tissues, which result in such clinical manifestations as epiphyseal dysgenesis, aseptic necrosis, possibly crystal-induced arthritis, and an arthropathy characterized by highly viscous noninflammatory joint effusions primarily affecting the knees, wrists, and hands. Neuropathic and myopathic symptoms accompanying hypothyroidism may manifest as joint region abnormalities when in fact there is no underlying arthropathy.[4- 6] Musculoskeletal symptoms associated with thyroid dysfunction include muscle weakness and pain, TM joint swelling and arthralgia, carpal tunnel syndrome and other neuropathic pains, and fibromyalgia-like complaints. Any of these musculoskeletal symptoms may initially be manifest as an isolated joint region complaint.[6, 7] Hence; in the present research, we aim to summarize the bone and joint manifestations in 25 hypothyroidism patients.

MATERIALS & METHODS

The present study represents bone and joint manifestations in 25 hypothyroidism patients. Complete demographic and clinical details of all the patients were obtained. A Performa was made and complete medical history of all the patients was recorded. Blood samples were obtained and serum analysis was done. Radiographic investigations were carried out. On a separate Performa, bone and joint

manifestations were recorded. All the results were summarized in Microsoft excel sheet and were analysed by SPSS software. Univariate analysis was done assessment of level of significance.

RESULTS

In the present study, data of 25 hypothyroidism patients with presence of bone and joint manifestations was recorded and analysed. Mean age of the patients was 34.5 years. 60 percent of the patients were males while the remaining were females. Positive family history of thyroid dysfunction was seen in 16 percent of the patients. Epiphyseal dysgenesis, Slipped capital femoral epiphysis, Aseptic necrosis, Pseudogout/Gout, Erosive osteoarthritis, Epiphyseal dysgenesis and slipped capital femoral epiphysis were seen in 60 percent, 52 percent, 40 percent, 32 percent, 24 percent, 16 percent, 20 percent and 12 percent of the patients respectively.

Table 1: Demographic data

Variable	Number
Mean age (years)	34.5
Males (%)	60
Females (%)	40
Family history of thyroid dysfunction (%)	16

Table 2: Bone and joint manifestations

Variable	Number	%
Epiphyseal dysgenesis	15	60
Slipped capital femoral epiphysis	13	52
Aseptic necrosis	10	40
Pseudogout/Gout	8	32
Erosive osteoarthritis	6	24
Epiphyseal dysgenesis	4	16
Slipped capital femoral epiphysis	5	20
Others	3	12

DISCUSSION

Hypothyroidism refers to the common pathological condition of thyroid hormone deficiency. If untreated, it can lead to serious adverse health effects and ultimately death. Because of the large variation in clinical presentation and general absence of symptom specificity, the definition of hypothyroidism is predominantly biochemical. Overt or clinical primary hypothyroidism is defined as thyroid-stimulating hormone (TSH) concentrations above the reference range and free thyroxine concentrations below the reference range.[6-9]

A study showing higher mean serum uric acid levels in a group of hypothyroid patients compared with controls raised questions regarding the possible role of uric acid or gout in articular complaints in these patients. The prevalence of hypothyroidism in patients with gout was studied using retrospectively gathered data on hospital discharge diagnoses. Durward found that 837 men with gout included 8 with hypothyroidism. These results were compared with only 1 hypothyroid individual found among 837 randomly selected age-matched controls among medical admissions to a hospital. While this difference was found to be significant, the numbers remain small, and no other studies have described similar patterns regarding higher than expected incidences of hypothyroidism among patients with gout.[10, 11]

In the present study, data of 25 hypothyroidism patients with presence of bone and joint manifestations was recorded and analysed. Mean age of the patients was 34.5 years. 60 percent of the patients were males while the remaining were females. Positive family history of thyroid dysfunction was seen in 16 percent of the patients. Epiphyseal dysgenesis, Slipped capital femoral epiphysis, Aseptic necrosis, Pseudogout/Gout, Erosive osteoarthritis, Epiphyseal dysgenesis and slipped capital femoral epiphysis were seen in 60 percent, 52 percent, 40 percent, 32 percent, 24 percent, 16 percent, 20 percent and 12 percent of the patients respectively. A study was undertaken in 29 juvenile autoimmune hypothyroid patients to study the skeletal manifestations of juvenile hypothyroidism and the impact of treatment of hypothyroidism on the skeletal system of juvenile patients. Hypothyroidism has a profound impact on the skeletal system and delayed bone age, dwarfism, and thickened bands at the metaphyseal ends being the most common findings. Post treatment, skeletal findings like delayed bone age and dwarfism improved significantly, but there were no significant changes in enlargement of sella, presence of wormian bones, epihyseal dysgenesis, vertebral changes and thickened band at the metaphyseal ends. With the treatment of hypothyroidism, there is an exuberant advancement of bone age, the catch up of bone age being approximately double of the chronological age advancement.[12] Li Q et al performed a case-control study of 65 RA patients and 550 matched non-RA subjects to assess the risk of thyroid dysfunction among rheumatoid patients (RA). The case-control study indicated that the prevalence of thyroid dysfunction was significantly higher in RA patients than controls (OR = 2.89, P < 0.001). Further subgroup analyses revealed positive correlations of RA with hypothyroidism (OR = 2.28, P = 0.006) and hyperthyroidism. Multivariate logistic regression analysis revealed an independent association between RA and thyroid dysfunction. Meta-analysis of 15 independent studies also showed an obviously increased risk of thyroid dysfunction among RA patients. Further subgroup analysis showed RA could obviously increase risk of hyperthyroidism and hypothyroidism. Their study provides strong evidence for the increased risk of thyroid dysfunction among RA patients.[13]

A randomized controlled trial in a heterogeneous group of 61 patients with subclinical hypothyroidism demonstrated that treatment with T4 to restore euthyroidism resulted in increased bone turnover at 24 and 48 weeks and reduced BMD after 48 weeks. A study of subclinical hypothyroidism in 4936 US men and women aged 65 years and older followed up for 12 years showed no association with BMD or incident hip fracture. A prospective study in men aged 65 and older who were followed for 4.6 years also revealed no association between subclinical hypothyroidism and bone loss. A prospective cohort study of 3567 community-dwelling men more than 65 years of age revealed a 2.3-fold increased risk of hip fracture over 13 years of follow-up in men with subclinical hypothyroidism after adjustment for covariates, including the use of thyroid hormones.[14- 17]

CONCLUSION

Thyroid hormones are essential for skeletal development and are important regulators of bone maintenance in adults. Epiphyseal dysgenesis, Slipped capital femoral epiphysis, Aseptic necrosis, Pseudogout/Gout and Erosive osteoarthritis were the most common bone and joint manifestation recorded among hypothyroidism patients.

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