Original Article

Frequency of joint hypermobility using Beighton's score in patients of fibromyalgia at a tertiary care hospital

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Objective: To determine frequency of joint hypermobility in patients of fibromyalgia presenting to our institution.

Methodology: This observational cross-sectional analytical study was conducted from June 2021 to May 2022 at Department of Medicine & Allied, Azra Naheed Medical College, Superior University, Lahore, Pakistan**.** Fibromyalgia was defined according to the 1990 ACR diagnostic Criteria of Fibromyalgia. Localized Joint Hypermobility was defined as ≤3 score and generalized Joint Hypermobility was defined as ≥4 score on the Beighton Score Scale. The study included 266 patients with fibromyalgia of both sexes aged between 16 years to 35 years. Joint hypermobility was assessed by using Beighton score.

Results: Mean age was 26.5±4.6 years with 178 (66.9%) females. Mean BMI was 23.9±3.9 kg/m^2. Mean Beighton score was 1.1±2.4. Generalized Joint Hypermobility was seen in 34 (12.8%) patients, 23 (8.6%) had localized hypermobility whereas 209 (78.6%) had no hypermobile joints. Stratification of outcome was done with regards to age (p=0.683), sex (p=0.238) and BMI (p=0.482).

Conclusion: This study showed that generalized joint hypermobility was present approximately in one out of every 10 patients and a quarter of patients had at least one clinically documented hypermobile joint.

Keywords: Beighton's score, fibromyalgia, generalized joint hypermobility, localized joint hypermobility.

INTRODUCTION

Joint hypermobility, a common physical sign, is generally ignored. It has been acknowledged as a condition often seen in healthy people, gymnasts, ballerinas and acrobats[1] and may also be present in some hereditary diseases, including Marfan syndrome, Ehlers-Danlos Syndrome, Down syndrome and Osteogenesis imperfect.[2] Generally, patients complaining of musculoskeletal symptoms first consult general physicians who ought to recognize joint hypermobility.

Using the Beighton score helps in diagnosis.[3] Management options include lifestyle modification and activity education, strengthening and stretching exercises and in certain cases manipulative osteopathic treatment.[3] Antonio et al,[4] found Generalized joint hypermobility (GJH) in 26.8% and localized hypermobility in 34.79% individuals. Hudson et al,[5] reported that the most common clinical diagnosis in hypermobile patients was soft tissue rheumatism, observed in 67%.

Fibromyalgia is a condition with chronic widespread pain seen in up to 8% population.[6] It has similarities with neuropathic pain clinically, pathophysiological and neuropharmacological. The predominant symptom is pain followed by allodynia and hyperalgesia.[6] The etiology and pathogenic mechanisms are unknown. Ofluoglu et al,[7] reported joint hypermobility in 64.2% fibromyalgia patients as compared to 22% in controls. Karaaslan et al,[8] reported joint hypermobility in 8% fibromyalgia patients and 6% controls (p>0.05). Using joint hypermobility 5 criteria (The Non-Dominant Spanish modification), Acasuso-Díaz et al,[9] found joint hypermobility in 27.3% patients of fibromyalgia and 11.4% patients with other rheumatologic diseases.

Sendur et al,[10] used Beighton scoring system and joint hypermobility was found more prevalent in fibromyalgia patients as compared to controls (46.6 vs 28.8%, p<0.05). No recent studies (less than 10 years) can be found regarding joint hypermobility in fibromyalgia in the international literature. Moreover, there is a lack of data regarding joint hypermobility and fibromyalgia in ethnic Pakistani population. A recent study from Lahore demonstrated GJH in 20.4% and localized hypermobility in 12.4% of healthy participants.[11] Furthermore, 23.5% participants with GJH reported having a history of musculoskeletal pain.[11] The present study was aimed to determine frequency of joint hypermobility in patients of fibromyalgia at our center.

METHODOLOGY

This observational cross-sectional study was conducted

from June 2021 to May 2022 at Department of Medicine & Allied, Azra Naheed Medical College, Superior University, Lahore, Pakistan. The study was approved by IRB of Azra Naheed Medical College. Keeping margin of error of 6% and confidence interval of 95%, a sample size of 266 was calculated.[10]

Fibromyalgia was defined according to the 1990 ACR diagnostic Criteria of Fibromyalgia as history of widespread pain in all 4 body quadrants for at least 3 months and a score of 11 or more on 18 Tender Points (Fig. 1).[12] Patients with previously diagnosed rheumatologic disorders (e.g., RA, SPA, SLE), degenerative joint disease (e.g., Osteoarthritis, DJD Spine), current or past bone fractures, and with history of joint replacement surgery were excluded.

After taking informed consent, 266 patients with fibromyalgia of both sexes aged between 16 years to 35 years were enrolled using consecutive non-probability sampling technique. Demographic information e.g., age, sex, weight, height, BMI etc. was obtained from each participant. Joint hypermobility was assessed by using Beighton score (Table 1). Localized joint hypermobility was defined as a score of 3 or less on the 9-point Beighton Score Scale and GJH was defined as a score of 4 or more on the 9-point Beighton Score Scale (Table 1).

Statistical Analysis: The data analysis was performed by SPSS version 21. Effect modifiers and confounders were controlled through stratification. Chi Square test was applied by taking $p \leq 0.05$ as significant.

RESULTS

Out of 266 patients, 178 (66.9%) were females. Mean age was 26.5±4.6 years. Mean BMI was 23.9±3.9 kg/m^2. Based on BMI, 29 (10.9%) patients were underweight, 73 (27.4%) overweight and 24 (9.0%) obese while 140 (52.6%) patients had normal BMI. Mean Beighton score was 1.1±2.4. GJH was seen in 34 (12.8%) patients; 23 (8.6%) had localized hypermobility whereas 209 (78.6%) had no hypermobile joints (Table 2).

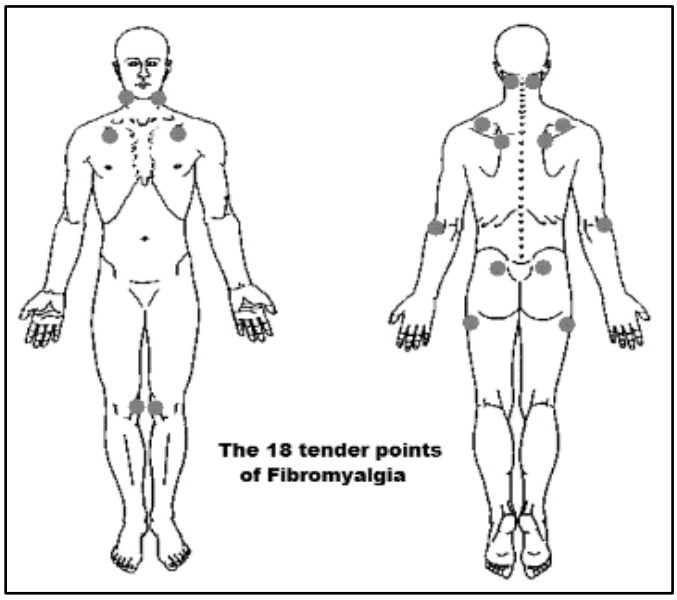

Fig. 1: The 18 tender points of Fibromyalgia.[12]

A comparison of demographic characteristics and GJH is shown in Table 3. Stratification of outcome was done with regards to age (p-0.638, non-significant), sex (p=0.283, non-significant) and BMI (p=0.482, non-significant). Localized joint hypermobility was defined as a score of 3 or less on the 9-point Beighton Score Scale and GJH was defined as a score of 4 or more on the 9-point Beighton Score Scale (Table 1).

DISCUSSION

In the 1970s the notion of joint hypermobility arose as a rheumatic phenomenon resulting in chronic

Table 1: Frequency of specific joint hypermobility.

Joints assessed	Joint Hypermobility		
	Present		Absent
Passive dorsiflexion & hyperextension of 5th MCP beyond 90°	Right	Left	Absent
Passive apposition of thumb to the flexor aspect of the forearm	Right	Left	Absent
Passive hyperextension of elbow beyond 10°	Right	Left	Absent
Passive hyperextension of knee beyond 10°	Right	Left	Absent
Active forward flexion of the trunk with the knees fully extended so that the palms of the hands rest flat on the floor	Present		Absent
Interpretation: Localized Joint Hypermobility: A score of 3 or less on the 9-point Beighton Score Scale Generalized Joint Hypermobility: A score of 4 or more on the 9-point Beighton Score Scale			

Table 2: Frequency of specific joint hypermobility.

Joints Assessed	Joint Hypermobility	
	Present	Absent
5th MCPs	26 (9.8%)	240 (90.2%)
Thumbs	28 (10.5%)	238 (89.5%)
Elbows	31 (11.3%)	236 (88.7%)
Knees	30 (11.7%)	237 (88.3%)
Trunk	35 (13.2%)	231 (86.8%)

Table 3. Demographic characteristics and generalized joint hypermobility.

Demographic variables	Generalized Joint Hypermobility		p-value
	Present	Absent	
Age:			
16 to 25 years	17 (11.9%)	126 (88.1%)	0.638
26 to 35 years	17 (13.8%)	106 (86.2%)	
Sex:			
Male	14 (15.9%)	74 (84.1%)	0.283
Female	20 (11.2%)	158 (88.2%)	
BMI:			
Underweight	05 (17.2%)	24 (82.8%)	
Normal	15 (10.7%)	125 (89.3%)	0.482
Overweight	09 (12.3%)	64 (87.7%)	
Obese	05 (20.8%)	19 (79.2%)	

musculoskeletal complaints, with multiple studies highlighting the link with chronic musculoskeletal pain and, more recently, with gastrointestinal dysmotility and dysautonomia.[13] Up to 50% children aged <10 years have variable degrees of hypermobility.[14] Higher prevalence is seen in Asian ethnicity, followed by African and European races.[15]

Employing Beighton scale with the same threshold of ≥4 score, Clinch et al,[16] found generalized hypermobility in 27.5% girls and 10.6% boys in the cohort aged ≤14 years healthy English adolescents. A recent study reported generalized hypermobility in 50% of Korean females[17] with frequency being inversely proportional to age (36.5% in adult women and 59.0% in girls). A recent study from Lahore reported GJH in 20.4% and localized hypermobility in 12.4% of healthy participants enrolled.[11]

In our study, GJH was seen in 34 (12.8%) patients; 23 (8.6%) had localized hypermobility whereas 209 (78.6%) had no hypermobile joints. We found that GJH was not associated with age, sex and BMI. In the study by Karaaslan et al,[8] joint hypermobility was seen in 8% of fibromyalgia patients as compared to 6% in control group ($p>0.05$). Sendur et al,[10] reported that joint hypermobility was more prevalent in fibromyalgia group as compared to controls (46.6 vs 28.8%, $p<0.05$). In the study by Hudson et al,[5] the most common clinical diagnosis in the hypermobile patients was soft tissue rheumatism, observed in 67% with fibromyalgia syndrome being the most common specific rheumatological diagnosis in 30% and inflammatory arthritis the least common diagnosis in 4%.

Musculoskeletal pain is frequently seen in hypermobile adults leading to poor quality of life along with contributions from obesity and sedentary lifestyle. The main musculoskeletal manifestation is chronic and generalized pain.[18] Failure to recognize extreme joint range of movement can lead to joint instability and traumas to repetitive stress.[19] Proprioceptive functions might be adversely affected due to trauma to mechanical connective tissue receptors leading to decreased muscle strength with limb pain.[20] Precipitated by physical activity without appropriate conditioning, extreme exercise, a traumatic incident, or without any obvious cause; the occurrence of musculoskeletal pain with hypermobility might be mere chance.

Furthermore, a vast gamut of extra-articular features in hypermobile individuals are recognized,[21] including poor wound healing, predisposition to ecchymosis, valvopathy, inguinal hernia, early onset of osteoarthritis and osteoporosis, vesico-ureteral reflux and gastrointestinal dysmotility.[22] Psychological manifestations including anxiety, fatigue and depression are also seen, which negatively affect well-being and social functioning[23] and may need intervention.

Our sample was not a true representative of the general population, as we enrolled only young participants aged 16 to 35 years old, and secondly it was done in an institutional setting. We do not have substantial knowledge about demographic attributes of hypermobile individuals in our ethnic population and therefore the implications of hypermobility are not properly understood. Our results propose a link of hypermobility with soft tissue rheumatism and can be beneficial to the clinician. The study was based in a single center and had a relatively small sample size. To establish the specific association of joint hypermobility and fibromyalgia, case control or cohort studies would have been better options but involve more resources and time.

CONCLUSION

Joint hypermobility may be associated with fibromyalgia and musculoskeletal pain. Generalized joint hypermobility was present approximately in one out of every 10 patients enrolled. Furthermore, a quarter of the patients had at least one clinically documented hypermobile joint. We suggest an association between joint hypermobility and fibromyalgia and therefore assessment for joint hypermobility should be useful to the clinical physician and rheumatologist.

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