ORIGINAL ARTICLE

Joint Laxity and Hypermobility in Adults at an Industrial Area of Karachi

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ABSTRACT

Objective: To determine the frequency of joint laxity and hypermobility in adults at Industrial area of Karachi.
Study Design: An observational survey.
Place and Duration of Study: The Department of Medicine, Jinnah Medical College Hospital, Karachi, from September to December 2008.
Methodology: Adults between the ages of 14-60 years presenting in the consultant OPD for different medical conditions were included and examined for joint laxity and hypermobility according to Beighton's score. A structured proforma was designed to record all information. Chi-square test was used to determine the statistical significance between two categorical variables. P-value of < 0.05 was considered as significant.
Results: Out of 1000 adults, 717 (71.7%) were males and 283 (28.3%) were females. Seventy (7%) adults had joint hypermobility including 48 (68.57%) males and 22 (31.43%) females. A total of 54 (77.1%) patients were found to have joint laxity; this included 75.9% males and 24.1% females, while 16 (22.9%) cases were having joint hypermobility including 43.7% males and 52.3% females. The Beighton score found higher in females than in males ($p < 0.04$). Family history of joint hypermobility was positive in 28 (40%) of the affected individuals. Individuals aged younger than 26 years scored higher than those aged above.
Conclusion: Joint laxity and hypermobility was not an uncommon rheumatological entity in the study group. It was significantly greater in females in terms of Beighton's score.

Key words: *Hypermobility. Joint laxity. Beighton's score.*

INTRODUCTION

From the earliest descriptions of joint laxity by Hippocrates (4th century BC) to the late 19th century, joint laxity remained unrecognized.[1] Thereafter, Sutro described the association between joint laxity and rheumatological symptoms.[2]

Hypermobility syndrome was defined by Kirk and Ansell as joint laxity producing musculoskeletal complaints.[3] Joint hypermobility is recognized by movement of a joint beyond its normal range.[4] This rheumatological condition is thought to be an inherited connective tissue disorder.[5,6] Generalized joint laxity is commonly seen in healthy individuals who do not have any complaints. Peoples of African, Asian and Middle Eastern descents have increased joint laxity.[7,8]

Joint hypermobility may provide an advantage in the performance of certain activities, but the joint lack the stability afforded by normal ligaments. Hypermobile subjects may be more susceptible to adverse effects of injury and over use.[9]

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Benign joint hypermobility shares certain characteristics with 4 less common connective tissue disorders like Marfan's syndrome, Ehler's Danlos syndrome, homocystinuria and osteogenesis imperfecta, but its manifestations are more benign. It may be found in chromosomal and genetic disorders, like Down syndrome, and metabolic disorders like homocystinuria and hyperlysinemia.[6]

Among the clinical manifestations of joint laxity and hypermobility are ligamentous injuries, dislocation, knee effusion, low back pain, spondylolisthesis, osteoarthritis and dysautonomia.[10-14] The most common of these is chronic joint pain which results from excessive joint laxity leads to wear and tear of joint surfaces and strain the soft tissue surrounding these joints. Some studies also suggest that proprioception in the joints of these persons with joint hypermobility is impaired; this impairment can also lead to excessive joint trauma due to impaired sensory feedback from the affected joints.[5,6] Recurrent joint dislocations and juvenile rheumatoid arthritis may also be associated with joint hypermobility.[7]

Since local data regarding joint hypermobility in a general population is missing, this study was conducted to find out the frequency of hypermobility.

METHODOLOGY

It was a hospital based survey conducted at the Consultant, OPD of Department of Medicine, JMCH,

Korangi, Karachi from September to December 2008. A total of 1478 patients attended consultant OPD for various medical reasons. All patients were invited to take part in this survey, irrespective of their sign and symptoms, out of whom 1000 adults were selected.

Inclusion criteria were age between 14-60 years, irrespective of gender and ethnicity, without any known rheumatological, orthopaedic or neurological illness, who could perform the required examination and were willing to participate in the study. Patients aged below 14 years and above 60 years, those could not perform the required examination, other illnesses like neurological diseases, painful rheumatological and orthopaedic conditions and those who were not willing to participate in the study were excluded.

The selected 1000 cases were tested for joint laxity and hypermobility by using Beighton score (Table I).[5-15] Patients scoring 0-3 were considered as normal. Joint laxity was positive when Beighton score ranged from 4-6 out of a total of 9, while hypermobility was positive when the Beighton score was greater than 6 out of 9. A structured proforma was designed to record all the information regarding age, gender, mobility of joints according to Beighton score and family history of joint hypermobility.

Table I: Beighton score.

Joint	Finding	Points
Left little (fifth) finger	Passive dorsiflexion beyond 90°	1
	Passive dorsiflexion <= 90°	0
Right little (fifth) finger	Passive dorsiflexion beyond 90°	1
	Passive dorsiflexion <= 90°	0
Left thumb	Passive dorsiflexion to the flexor aspect of the forearm	1
	Cannot passively dorsiflex thumb to flexor aspect of the forearm	0
Right thumb	Passive dorsiflexion to the flexor aspect of the forearm	1
	Cannot passively dorsiflex thumb to flexor aspect of the forearm	0
Left elbow	Hyperextend beyond 10°	1
	Extends <= 10	0
Right elbow	Hyperextend beyond 10°	1
	Extends <= 10	0
Left knee	Hyperextend beyond 10°	1
	Extends <= 10	0
Right knee	Hyperextend beyond 10°	1
	Extends <= 10	0
Forward flexion of trunk with knees full extended	Palms and hands can rest flat on the floor	1
	Palms and hands cannot rest flat on the floor	0

The aim of study was explained to the patients and an informed consent was obtained. Approval of the study was obtained from the Ethical Committee of the hospital.

Data were analyzed using the descriptive statistical module of SPSS 11.5. Mean and standard deviation were used to summarize continuous variables while percentages were used for categorical variables. Chi-square test was used to determine the statistical significance between two categorical variables.

RESULTS

Among the 1000 persons included from the various in Medical O.P.D at Jinnah Medical Hospital Karachi, 717 (71.7%) were males and 283 (28.3%) were females. Out of those 1000 patients, 70 (7%) were found to have joint laxity and hypermobility according to standard Beighton's score, with age ranges between 14-60 years with mean of 25.6 ± 11.02 years. Out of 70 cases, 48(68.5%) were males having joint laxity and hypermobility as compared to 22 (28.5%) females.

Family history of joint hypermobility was positive in 28 (40%) cases. The mean total Beighton's score was 5.49. The score of 4, out of 9 was found in 13 (18.5%) cases, of whom 11 were males and 2 were females. A score of 5, out of 9 seen in 32 (45.7%) cases, of that 24 were males and 8 females, score 6, out of 9 in 9 (12.8%) cases, of that 6 were males and 3 females, score 7, out of 9, in 13 (18.5%) cases, of that 7 were males and 6 females, score 9, out of 9 seen in 3 (4.2%) cases and all 3 were females (Table II). With the reference of age, those aged 25 years or under had a higher Beighton's score than those aged 26 years or above (Table III).

Table II: Comparison of Beighton's score among male and female and frequency of joint laxity and hypermobility.

Total Beighton score	Males		Females		Total patients		p-value
	No.	%	No.	%	No.	%	
4	11	22.9%	2	9.09%	13	18.8%	0.04
5	24	50%	8	36.4%	32	45.7%	
6	6	12.5%	3	13.6%	9	12.9%	
7	7	14.9%	6	27.3%	13	18.8%	
9	0	0%	3	13.6%	3	4.3%	

Level of significance is p-value < 0.05.

Table III: Comparison of Beighton's score regarding age.

Total Beighton score		4	5	6	7	8	9	p-value
Age	≤ 25	8	15	9	11	0	3	0.09
	≥ 26	5	17	0	2	0	0	
	Total	13	32	9	13	0	3	

Level of significance is p-value < 0.05.

Out of the 70 patients with Beighton's score of greater than 4 out of 9, 54 (77.1%) patients were found to have joint laxity, out of whom 41 (75.9%) were males and 13 (24.1%) were female; while 16 cases (22.8%) had joint hypermobility including 7 (43.7%) males and 9 (52.3%) females.

The overall joint laxity and hypermobility score was higher among females as compared to males (7.8% vs. 6.7%). Beighton score of 4/9 was set for this study; with higher score i.e. 4/9, 5/9 and 6/9 then the frequency changed to 5.7% and 2.5% respectively.

DISCUSSION

Joint hypermobility and joint laxity is considered as minor rheumatological entity which occurs in 5-15% of general population.[16] The frequency of joint laxity and hypermobility varies with age, gender and ethnicity of studied population.[7,17]

Reports of the prevalence of hypermobility syndrome (HMS) must be viewed cautiously because of the variability in the diagnostic criteria used. Hypermobility syndrome has been reported in 0.6%[15] to 31.5%[8] of adults without joint pain, depending on age, ethnicity, and criteria for assessing hypermobility. Reports indicate that hypermobility syndrome (HMS) may be more prevalent among females from 1.1 times[18] to 5.5 times[10] as compared to males. Hypermobility syndrome is also more prevalent among Asians than among Africans, and it is more prevalent among Africans than Caucasians.[19,20] Children without symptoms of HMS tend to have rates of hypermobility that are higher than those of adults (between 6.7%[10] and 39.6%),[21] again depending on the population and criteria used. Hypermobility appears to decrease with age[15,22]

In this study using Beighton score criteria of 4/9 hypermobility was found in 7% of patients, while Beighton *et al.*[15] found 2.4% in African adult population with score criteria of 6/9. With criteria set at 6/9 this study showed 2.5% hypermobility in these patients. Wordsworth *et al*.[20] found hypermobility in 1.9% of Caucasians using Beighton score criteria of 5/9, with this criterion our rate of hypermobility was 5.7%. On the other hand Scott *et al*. found hypermobility in 16% of adult population using Beighton score criteria of 3/9,[23] Decoster *et al*. found hypermobility in 12.3% in US adult athletes with average age of 15.5 years by using Beighton score criteria of 5/9,[24] and Larson *et al*. found hypermobility in 19.1% of adult US music students.[22] In those studies the investigators studied a particular group of population; in this study hypermobility was examined in general population. Kumar *et al*. found hypermobility in 20% of rheumatology referrals in northern India by using Beighton score criteria of 5/9.[18] In this study the investigated population was referred to a particular specialty, but the patients had different medical conditions. The above variable results of different studies suggest that rates of hypermobility highly depend on the population and criteria used.

Whatever the criteria and population used, females were found more hypermobile than males,[10,24] and hypermobility decreased with advancing age in males.[15,22] In this study the high Beighton scores were also seen more frequently in females as compared to males with p-value of < 0.04 (Table II) and younger adults were more hypermobile than older ones. It was single centre study, which found frequency of joint laxity and hypermobility in a particular area. So it is suggested that large scale multi-centre studies have to be conducted to find the true prevalence of hypermobility in our country, in various ethnic groups.

Often joint hypermobility causes no symptom and requires no treatment. Many individuals with joint hypermobility syndrome improve in adulthood. Treatments are customized for each individual based on their particular manifestation. Joint pain can be relieved by medication for pain and inflammation while proper physical fitness exercise can strengthen muscles and stability, but the nature of exercise should be designed to avoid injury to joints.[25]

CONCLUSION

Joint laxity and hypermobility is not an uncommon clinical finding in medicine and rather common in rheumatology practice. It is necessary to identify benign joint hypermobility because it may cause chronic joint pain and resembles other rheumatological disorders. Knowledge of the diagnosis and simple intervention are likely to be highly effective in reducing the morbidity and cost to the health and social services.

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