IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 8 Ser. 7 (August. 2019), PP 16-19
www.iosrjournals.org

Association of Musculoskeletal Pain with Body Composition Parameters

LokeshAgarwal[1], Mili Sengar[2*], Kuldeep Srivastava[3], Sumit Saxena[3], Abhishek Gupta[3]

[1]Professor and Head of Department, [2]Assistant Professor,[3]Associate Professor, Department of Community Medicine, T S Misra Medical College, Lucknow
**Corresponding author: Dr Mili Sengar,*

Abstract: *Musculoskeletal pain (MSP) is the most common chronic impairment in developed and developing countries as nearly 25% of adult subjects suffer from chronic MS pain. Obesity leads to increased loading of the weight-bearing joint, which may be the most important mechanical contribution.*

Objective: *To study the magnitude of musculoskeletal pain among women and to assess relation between musculoskeletal pain and body composition parameters.*

Material and method*: a cross-sectional study, conducted in the population around Rural Health Training Centre (RHTC) and Urban Health Centre (UHC), Barabanki district in 2015 among women in the age group 25-65 years. 301 women from rural area and 52 from urban area were selected as study participants. Body composition parameters included -weight, height (using a stadiometer), BMI, waist circumference, hip circumference. Information regarding location(in the neck, shoulders, upper back, upper arms, lower back, forearms, wrists, hip/buttocks, thighs, knees, lower legs and ankles) was recorded in separate datasheets for each individual.*

Result:*The overall prevalence of musculoskeletal pain in Barabanki district was 45.33% (88.46% pain was absent in 64.67% of study subjects. There was significant association between high BMI with musculoskeletal pain.*

Conclusion: *The study highlights the need to formulate a policy and device specific intervention to alleviate suffering and reduce health care costs and lost productivity due to MS problems.*

Keywords: *MSP, BMI, body composition parameters*

Date of Submission: 29-07-2019 Date of Acceptance: 14-08-2019

Musculoskeletal conditions affect more than 1.7 billion people worldwide and have the 4th greatest impact on the overall health of the world population, considering both death and disability. This burden has increased by 45% during the past 20 years and will continue to escalate unless action is taken.[1] These cause considerable functional limitations in the adult population of most welfare states as compared to any other group of disorders. They are also a major cause of years lived with disability (YLDs) in all continents and economies.[2] Current estimates of people affected worldwide include: back pain 632 million, neck pain 332 million, osteoarthritis of the knee 251 million, and other musculoskeletal (MS) conditions 561 million. As a group MS disorders cause 21.3% of all YLDs, and is second only to mental/ behavioural disorders that account for 22.7% of YLDs. Worldwide low back pain is leading cause of disability and contributes 10.7% of total YLDs. Low back pain (83.1 million YLDs), neck pain (33.6 million YLDs), and osteoarthritis (17.1 million YLDs) are chief causes of MS problems.[1]

Human body composition changes with age, but the causes and consequences of these changes are unsatisfactorily understood. Studies have reported that fat mass increases with age, whereas lean mass, especially bone mass and muscle mass decline.Changes in body composition with aging have been associated with increased morbidity and mortality which predisposes tofalls and osteoporotic fractures.[3]

The concept that body size, shape and composition influence susceptibility and resistance to disease is truly ancient.[4]Generally, women have more complex and stressful aging process as compared to men,due to hormonal changes that occurduring menopausal transition.[5] The onset of this physiological development not only marks the end of femalereproductive function and makes them more vulnerable to a new set of health problems like cardiovascular diseases, osteoporosis and so on.[6]BMI is a commonly used indicator for screening of body composition. It is widely used to predict ideal weight in relation to height and identify malnourished individuals and groups.[1]

I. Objectives

1. To studythe magnitude of musculoskeletal painamong women.
2. To assess relation betweenmusculoskeletal painand body composition parameters.

II. Material And Method

A cross-sectional study**,** conducted in the population around Rural Health Training Centre (RHTC) and Urban Health Centre (UHC), Barabanki district between July to December 2015 among women in the age group 25-65 years. The sample size was calculated to be 330 considering an expected prevalence rate of 31.3% (musculoskeletal pain among women), [7] with absolute precision of 5%. Since ninety percent of population of Barabanki is rural, [8] by Population Proportion Sampling, 297 (~301) women from rural area and 33(~52) from urban area were selected as study participants.Multistage sampling was done to select participants – 301 in rural and 52 participants in urban areas.

Methodology: Body composition parameters included -weight, height (using a stadiometer), BMI, waist circumference, hip circumference. Personal, social and occupational details of each subject were collected through a pretested questionnaire. Information regarding location (inthe neck, shoulders, upper back, upper arms, lower back,forearms, wrists, hip/buttocks, thighs, knees, lower legs and ankles) was recorded in separate datasheets for eachindividual.[9]The BMI of the subjects was classified into normal, overweight and obese based on WHO classification.**Statistical methods:** All data was compiled on MS Excel with subsequent clean up and proper checks. Chi-square tests was used to test the associations between the different variables. A p value <0.05 was considered significant.The results were interpreted on the basis of significance and association found among all the variables.

III. Results

The mean age of rural women was 41.69 ± 11.86 and urban women were 35.10 ± 7.66. Majority of women were of Hindu religion (96.67% in rural and 92.6% in urban) and OBC caste (85.22% in rural and 79.17% in urban). More than half individuals (61.8%) in rural area lived in joint families whereas 82.69% in urban area belonged to nuclear families. Most of the females were married (94% in rural and 84.62% in urban) and only 2.7% in rural area and 3.84% urban area were widows. Over 40% females belonged to lower and lower middle class. 51.3% of the females in rural areas were illiterate and 55.77% in urban area had education upto intermediate. Eighty nine percent of females in rural area were housewives, 5% were farmers and 2% were government employee. Most common occupation in urban area was private service (34.62%) followed by government employee (28.85%) and 21.15% were housewives.

Table 1 show the prevalence of high waist-hip ratio was (43.34%). High BMI (overweight & obese) was found in 28.33%. More than 50% study subjects had normal BMI, waist circumference and waist-hip ratio.

Table 1: Classification of Body composition parameters among study subjects

Body composition parameters	Low	Normal	High
Waist circumference	-	243 (68.8%)	110 (31.2%)
Waist-Hip ratio	-	200 (56.66%)	153 (43.34%)
BMI	69 (19.55%)	184 (52.12%)	100 (28.33%)

Table 2 shows that the overall prevalence of musculoskeletal pain in Barabanki district was 45.33% (88.46% in urban and 37.87% in rural). Musculoskeletal pain was absent in 64.67% of study subjects.

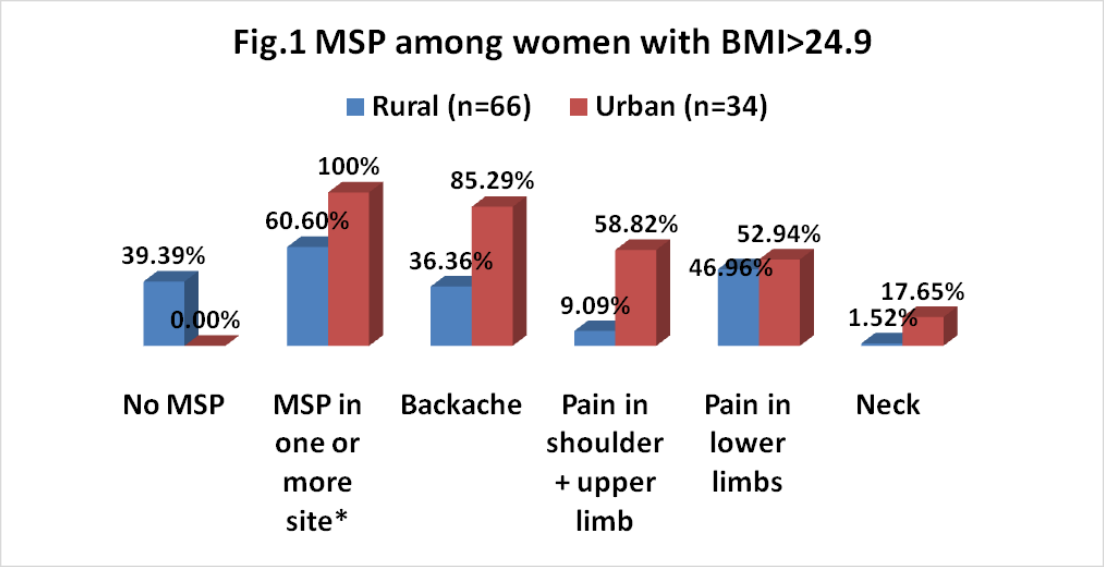
Table 2: Prevalence of MSP

MSP	Rural (n=301)	Urban (n=52)	Total (n=353)
MSP present	114 (37.87%)	46 (88.46%)	160 (45.33%)
MSP absent	187 (62.13%)	6 (11.54%)	194 (64.67%)

Table 3 shows that there was significant association between high BMI with musculoskeletal pain. The risk of MSP is 5 times higher in BMI ≥25 than in women with BMI< 25. Figure 1 shows the prevalence of MSP in women with BMI>24.9.

Table 3: Association between MSP and Body composition parameters

MSP	**BMI**		O.R. 5.53
+/-	**<25**	**≥25**	C.I. 3.304-9.242
MSP	86	74	p value <0.05
No MSP	167	26	
Total	253	100	



***Either the neck, hand, shoulder, upper back, lower back, thigh, knee or ankle.**

IV. Discussion

Similar to the present study a significantly higher BMIwas found in subjects with MSP as compared to those who had no MSP. A positive correlation between age and this body factor.[7]MSP was more common among females. Significant association of pain was found with obesity.[10]Being overweight or obese puts extra weight on human muscles and thus increases the risk of MSP.[11, 7]A recent study showed that overweight and obesity increased the risk of widespread chronic musculoskeletal pain during 11-year follow-up.[12]

Whether excess body mass has a similar effect on risk of localized chronic pain in the low back or neck/shoulders is unknown as per another study.[13] Several studies have reported that the higher prevalence of low back pain in menopausal middle aged women.[14-16] Increase in BMI, was observed among housewives with MSP as compared to no MSP group. This is similar to a study done in National Capital Region in India.[17] Musculoskeletal pain is also one of the most common reasons for seeking medical advice in Western societies.[18, 19]

V. Conclusion

A weight-for-height measure such as Body Mass Index (BMI) is a simple inexpensive method of determining overall fatness. Awareness based on the present findings and combined with suitable fitness regimes can form the basis of a strategy for reducing the burden of MSP globally.

References

[1]. Leavitt SB (2012) Soaring Burden of Musculoskeletal Pain. Available:http://updates.pain-topics.org/2012/12/a-soaring-burden-ofmusculoskeletal- pain.html. Accessed 1 May 2014.
[2]. Woolf AD, Akesson K (2001) Understanding the burden of musculoskeletal conditions. The burden is huge and not reflected in national health priorities. BMJ 322: 1079-1080.10.1136/bmj.322.7294.1079 PubMed: 11337425 [PMC free article] [PubMed]
[3]. GunsahSahin, HayalGuler, MelekSezgin, Ismet As. The Effect of Body Composition and Hand Grip Strength on Axial Bone Mineral Density in Turkish Postmenopausal Women Aged 50-65 Years: Is Lean Mass a Predictor?Turk J Phys Med Rehab 2006;52(1):28-30
[4]. Baumgarther RN, Heymsfield SB, Roche AF. Human body composition and the epidemiology of chronic disease. Obes Res 1995;3:73-95.
[5]. Morrison, J.H., Brinton, R.D., Schmidt, P.J. and Gore, A.C. (2006) Estrogen, menopause, and the aging brain: How neuroscience can inform hormone therapy in women. The Journal of Neuroscience, 26, 10332-10348. doi:10.1523/JNEUROSCI.3369-06.2006
[6]. Shakhatreh, F.M. and Mas'ad, D. (2006) Menopausal symptoms and health problems of women aged 50-65 years in Southern Jordan. Climacteric, 9, 305-311. doi:10.1080/13697130600861542

[7]. V. Bihari,C. Kesavachandran, B. S. Pangtey, A. K. Srivastava, N. Mathur. Musculoskeletal pain and its associated risk factors in residents of National Capital Region. Indian Journal of Occupational and Environmental Medicine - August 2011 - Volume 15 - Issue 2; 59-64
[8]. Available: http://www.icssr.org/district%20barabanki%20-%20ssa%20jafri.pdf. Accessed 1 May 2014.
[9]. Kuorinka, B. Jonsson t, A. Kilbom, H. Vinterbergtt, F. Biering-S6rensen ,G. Andersson, K. J6rgensen. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. Applied Ergonomics 1987, 18.3,233-237.
[10]. C. Kesavachandran et al. Musculoskeletal pain and its associated risk factors in residents of National Capital Region. Ind J of Occupational and Environmental Medicine. 2011; 15(2): 59-63.
[11]. Peltonen M, Lindroos AK, Torgerson JS. Musculoskeletal pain in the obese: A comparison with a general population and long-term changes after conventional and surgical obesity treatment. Pain. 2003; 104:549–557.
[12]. Mork PJ, Vasseljen O, Nilsen TI. Association between physical exercise, body mass index, and risk of fibromyalgia: longitudinal data from the Norwegian Nord-Trøndelag Health Study. Arthritis Care Res (Hoboken).2010 62: 611–617.
[13]. Nilsen TIL, Andreas H, Mork PJ. Physical Exercise, Body Mass Index, and Risk of Chronic Pain in the Low Back and Neck/Shoulders: Longitudinal Data From the Nord- Trøndelag Health Study. Am J Epidemiol. 2011.doi: 10.1093/aje/kwr087
[14]. Adera T, Deyo RA, Donatelle RJ. Premature menopause and low back pain: A population based study. Ann Epidemiol.1994 4: 416-422.
[15]. Lau EMC, Egger P, Coggon D, Cooper C, Valenti L et al. Low back pain in Hong Kong: Prevalence and characteristics compared with Britain. J Epidemiol Community Health.1995;49: 492-494.
[16]. Yip YB, Ho SC, Chan SG. Tall stature, overweight and the prevalence of low back pain in Chinese middle aged women. Int J Obes.2001;25: 887-892.
[17]. Bihari V, Kesavachandran CN, Mathur N, Pangtey BS, Kamal R, Pathak MK, Srivastava AK. Mathematically Derived Body Volume and Risk of Musculoskeletal Pain among Housewives in North India. PLOS ONE. 2013;8: e80133.
[18]. Moore R, Brodsgaard I (1999) Cross-cultural investigations of pain, In: IK CrombiePR CroftSJ Linton. Epidemiology of Pain. Seattle, WA: IASP Press, pp. 53-80.
[19]. Weevers HJ, van der Beek AJ, Anema JR, van der Wal G, van Mechelen W. Work-related disease in general practice: a systematic review. Fam Pract.2005;22: 197–204.

Dr Mili Sengar. "Association of Musculoskeletal Pain with Body Composition Parameters." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 8, 2019, pp 16-19.