Prevalence of Osteoarthritis of Weight Bearing Joints in Relation to Body Weight in Both Genders

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Dr. Dr. Niaz J. AL-Barzinjy *

ABSTRACT

Background and Objectives: Obesity is an important and increasing public health problem, being a risk factor for overall mortality and major chronic disease.To determine relationship between different measures of body mass index and incidence of hip and knee osteoarthritis in male and female.

Methods: Comparison of prevalence of primary osteoarthritis of knee and hip. Between age and sex matched control from out patient clinic of Erbil and Rizgary teaching hospital over period of eleven months starting on Jan 2007.this constituted one hundred and eighty five subjects of normal body `mass index. And one hundred and sixty subjects with high body mass index. Subjects fulfilling our inclusion criteria under went clinical evaluation and radiology of their knee and hip joints, we assessed by chi-squared test, differences in frequency of osteoarthritis between those with normal body mass index and those with high body mass index and between male and female

Results: Obesity was a stronger predictor of osteoarthritis of knee joint with no sex and age difference. In the prevalence of osteoarthritis of hip joint. No link between obesity and hip osteoarthritis was found in this study.

Conclusions: Obesity in 35-45 year old men and female will predispose to primary osteoarthritis of the knee.

INTRODUCTION:

Obesity is an important and increasing public health problem, being a risk factor for overall mortality and major chronic disease, including cardiovascular disease, diabetes mellitus, cancer and musculoskeletal disorder.[1-3] Many studies have focused on the effect of obesity on mortality. However, consideration of only fatal events may underestimate the consequences of obesity.[4-5] For example, several studies have found an effect of obesity on disability in the elderly, and the association appears to be comparable to or even greater than the association between obesity and mortality.[6-7] According to the latest W.H.O projections, more than 1.6 billion adults age 15 years are overweight; and at least 400 million are obese world wide.[8] UK data from the 2003 health survey for England reported that 33%. of women and 43% of men over the age of 16 were over weight, whereas 23% and 22% , respectively, were obese. Disease burden from excess weight is significant; including cardiovascular disease, diabetes, dyslipidaemia, sleep apnea and certain cancer.[9] Increased weight leads to a number of musculoskeletal problems. Osteoarthritis is the most common disorder of joint.[10] Commonly, it results from one or the inter play of several predisposing factors; such OA is designated as secondary OA. The predisposing factors include joint injury, developmental abnormalities, affection of a joint by another disease, or one of several metabolic disorders. [11-14] There are also risk factors, which increase the vulnerability to develop O.A. These include older age, excessive or strenuous physical

* MBChB, DRMR.Assistant lecturer of Rheumatology, Department of Medicine, College of Medicine, Hawler Medical University, Erbil - Iraq

activity, female sex, race, and poor muscle strength[11-17]. This study aims mainly at looking for any favorable or unfavorable association between hip and or knee OA and increase body weight. In Kurdish male and female.

MATERIAL AND METHOD:

Co-operative 345 Kurdish subjects 159 males and 186 females, ages between 35-45 years old, mean age= 40.5, SD± 3.2 year, from out-patient clinics of Erbil and Rizgary teaching Hospital from Erbil city, constituted the source of the sample of subjects included in this study. Ages below 45 included in the study because of the expected very low prevalence of primary OA in such age. Each subject was weighted while wearing light clothes and height was measured with out shoes. Those with normal and high body mass index included in this study, we also by clinical evaluation and some blood tests excluded subjects with:

1- Ages above 45.
2- Having sustained previous major trauma to the bone or joints of the lower limbs.
3- With known previous or ongoing infective, inflammatory, or metabolic joint disease.
4- Having developmental deformities like acetabular dysplasia, perthes disease, congenital displaced hip, leg length discrepancy, varus or valgus deformity.
5- With particularly harmful occupation to weight bearing joints notably farmer.
6- With E.S.R more than 40 mm/hr or abnormally raised serum uric acid.

The study extended over a period of eleven months, starting on January 2007. Each subject included was interviewed as whether he is of normal BMI or high BMI. Radiology, Anteroposterior and Lateral view for both hip and knee joints was done. Diagnosis of osteoarthritis was according to American Collage of Rheumatology classification criteria of osteoarthritis, clinically and radiologically of both hip and knee joints.[11]

A- Criteria for hip OA:

Hip pain and at least two of the following three features:

1- E.S.R less than 20 mm/hr.
2- Radiographic femoral or acetabular osteophytes.
3- Radiographic joint space narrowing (superior, axial, and/or medial).

B- Criteria for knee OA:

clinical and radiographic

1- Age more than 50 years
2- Stiffness less than 30 minutes.
3- Crepitus + Osteophytes.

Subjects were divided into two main groups: those with normal body mass index and those with high body mass index. Those with high body mass index was further subdivided into male and female. And also subdivided into two sub-groups those with body mass index 25-29.9 kg/m^2 and those with body mass index above 30 kg/m^2.

Statistical analysis:

The data were put into the Microsoft excels and then analyzed by using statistical pack-age for social sciences (SPSS) version 15. To accept or reject hypotheses by Chi -square test, for all these a p value less than 0.05 considered as significant while p value more than 0.05 regarded as non sig-nificant.

The study included 345 subjects 185 subjects with normal body mass index and 160 subjects with high body mass index.

RESULT:

Table(1) compares the frequency osteoarthritis of hip joint no significant difference found in between those with high and normal body mass index. So our results, of necessity, shall be confined to OA of the knees.

Table 2 compares the frequency of OA of knee among those with normal and high body mass index, highly significant difference found in frequency of OA among those with high body mass index.

Those with high body mass index further sub divided in to those with body mass index range from 25-29.9 kg/m^2 and those body mass index more than 30 kg/m^2 as shown in table 3 we compare the frequency of OA in between two group we find significant higher prevalence of OA of the knees was encountered among those with B.M.I above 30 kg/m^2. Among those with high B.M.I 86 was female and 74 was male as shown in table 4 we compare the frequency of O.A among male and female, but no significant difference found.

Table 5 compares the frequency of O.A among 2 age sub group of those with high body mass index, 78 subject ages was from 35-40 and 82 subject ages was from 41-45, no significant difference found in between the two sub group.

Table 1: Frequency of Hip osteoarthritis (OA) among those with normal and high body mass index

Age (years)	Normal body mass index		High body mass index	
	Total No. (%)	Affected by OA No. (%)	Total No. (%)	Affected by OA No. (%)
35-45	185 (100%)	3 (1.62%)	160 (100%)	8 (5%)*

* p> 0.05 (Not significant)

Table 2: Frequency of Knee osteoarthritis (OA) among those with normal and high body mass index.

Age (years)	Normal body mass index		High body mass index	
	Total No. (%)	Affected by OA No. (%)	Total No. (%)	Affected by OA No. (%)
35-45	185 (100%)	11(5.94%)	160 (100%)	64 (40%)**

** p< 0.01 (highly significant difference)

Table 3: Comparison of the frequency of Knee osteoarthritis (OA) among those with BMI (25-29.9 Kg/m2) and those with BMI more than 30 Kg/m2.

Age (years)	Subjects with BMI (25-29.9 Kg/m^2)		Subjects with BMI above 30Kg/m^2	
	Total No.	Affected by OA No. (%)	Total No.	Affected by OA No. (%)
35-45	64	13 (20.31)	96	51(53.125) **

** p< 0.01 (highly significant difference)

Table 4: Comparison of the frequency of Knee osteoarthritis (OA) among female and male sex with high body mass index

Age (years)	Male		Female	
	Total No.	Affected by OA No. (%)	Total No.	Affected by OA No. (%)
35-45	74	28(37.82)	86	36(41.86) *

* p> 0.05 (Not significant)

Table 5: Comparison of the frequency of Knee osteoarthritis (OA) among those ages from 35-40 years and those ages from 41-45

High BMI	Age (35-40)		Age (41-45)	
	Total No.	Affected by OA No. (%)	Total No.	Affected by OA No. (%)
25- ↑	78	29(37.17)	82	35(42.68) *

* p> 0.05 (Not significant)

DISCUSSION:

Our selection of subjects aimed, not only at excluding secondary OA but also at obtaining as similar samples as permissible for allowing conduction of the comparisons of the study. Clinically evident predisposing causes were excluded and risk factors were either avoided or allowed as equal a role as possible on comparing groups. Thus all subjects were derived from a Kurdish male and female, exclusion of subjects above age 45 because of high prevalence of primary O.A in ages above 45.[18-21] Ages below 45 included in the study because of the expected very low prevalence of primary OA in such age[14]. Moreover, the included subjects were also statistically re-evaluated as two sub groups of narrower age ranges, to minimize, if not nullify, the effect of this strongest risk factor[12,14,18,22].

The hip joint: We find small no. of subjects affected by OA of hip joints. This confirms the recognized low prevalence of OA. Of the hip among Middle Eastern population as found in another study from Saudi Arabia[23] . However, this contrast with the status in developed countries where hip OA is said to prevail in some 50% of patients having OA of the knees[24]. Evidence supporting a role of overweight as risk factors for OA of the knee joints. Finding from this study strongly favor that overweight is strong risk factor for OA of knee by highly significant $p<0.01$,high prevalence of OA among subjects who have body mass index more than 25 kg/m^2. This result was similar to some world wide studies[25,26]. On subdividing the subjects to two narrower BMI, a significant difference $p<0.01$ was maintained in between those BMI. less than 30 kg/m^2 and those BMI. more than 30 kg/m^2. Weight could act through two different intermediaries to cause OA of knee joint. First , and most logically , being over weight, because it increase the load across a joint, could increase stress on cartilage and induce breakdown that then leads to OA[27]. Second persons who are over weight may have a circulating factor, possibly a cartilage growth factor or bone

factor that may act to accelerate cartilage breakdown or affect the bone underneath cartilage and lead to OA[28].

CONCLUSIONS :

As shown from this study that people of high body mass index tend to develop osteoarthritis of the knee joint at an earlier age and to a greater severity than their slim counterparts. So professionals who treating knee osteoarthritis should bear a possible Weight reduction in mind when ever a patient is significantly over weight.

DISCUSSION:

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