Obesity and Severity of Osteoarthritis

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Abstract

Obesity is well documented as a prominent risk factor of osteoarthritis (OA). When osteoarthritis extensively affects the joints, it becomes a major cause of mobility impairment creating definite psychosocial impact. The effect of obesity on the severity of the disease in terms of physical and psychosocial impact is less studied. This study tried to find the association of the severity of physical symptoms of OA with obesity and its effect on psychosocial problems associated with osteoarthritis.

Patients with osteoarthritis attending the Orthopaedics outpatient department at Government Medical College, Thiruvananthapuram, Kerala, were interviewed using a structured questionnaire that included physical, emotional and social parameters. They were asked to rate the physical parameters on a scale of 1 to 5 based on severity and mention which among the psychosocial parameters were present.

Methods

A cross sectional study was carried out involving forty (n=40) patients with osteoarthritis attending the Orthopaedics outpatient department at Government Medical College, Thiruvananthapuram, Kerala, were interviewed using a structured questionnaire that included physical, emotional and social parameters. They were asked to rate the physical parameters on a scale of 1 to 5 based on severity and mention which among the psychosocial parameters were present.

Results

There was a significant correlation between obesity and the severity of physical symptoms of OA. Obese patients had a significantly higher total severity score (p=0.019) and stiffness sub score (p=0.019). The social functions affected were mainly participation in leisure activities and the emotional problems were predominantly anxiety and stress. Obese participants with osteoarthritis had 10 times more chance of restricting leisure activities when compared to non-obese participants. Anxiety was also more prevalent among the obese participants and they were 15 times more stressed than their non-obese counterparts.

Keywords: Obesity, Osteoarthritis, Stress, Joint Stiffness, Anxiety

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patients attending the orthopedics outpatient department of Medical College Hospital in Thiruvananthapuram, Kerala, India during the period 1st October to 22nd November, 2010. Informed consent was obtained from each patient. All patients in the study were diagnosed by an orthopedic surgeon to have osteoarthritis. Only those who had a history of OA for more than 1 year were included. Patients with other joint disease like rheumatoid arthritis, ankylosing spondylitis, or injury to the knee or hip within the past 12 months were excluded as these are other risk factors of OA that would affect the severity of the disease.

First their individual height and weight were recorded. Weight was measured using a calibrated, high quality weighing balance and height was measured using a stadiometer. Obesity was measured in terms of body mass index (BMI). Patients with BMI > 30 were considered obese and those with BMI < 30 as non-obese.

The participants were interviewed using a pre-tested questionnaire, structured using 24 parameters under three subscales of pain, stiffness and physical function similar to those included in WOMAC index of osteoarthritis.10 The participants were asked to rate each parameter from 1 to 5. The participants were also interviewed for the presence or absence of 7 social parameters (restriction of leisure activities, attending community events and places of worship, relations with spouse, with family, with friends and with others) and 10 emotional parameters (anxiety, irritability, frustration, depression, relaxation, insomnia, boredom, stress, loneliness and well-being).

For each participant, a total score (that indicates severity of disease and referred to as total severity score) and three different sub scores for stiffness, pain and physical function were calculated. The data was analyzed using the SPSS statistical software. The mean rank score of obese and non-obese individuals were compared using Mann-Whitney U test.

For each parameter a Chi-Square test was done to find whether there is a statistically significant difference between obese and non-obese individuals. For those categories with expected cell frequency less than 5, we did the Fischers Exact test to compute p value.

Results

The median age of the participants was 55.5 years and 65% were above 50 years. 80% of the patients had involvement of the knee only, that included 62.5% of the obese patients (Table 1).

The scores obtained for severity of OA were the pain sub-score (mean 11.2; SD-4.4), the joint stiffness sub-score (mean 3.6; SD-3.6) the physical function sub-score (mean 36.1; SD-12.5) and the total severity score (mean 50.9; SD-17.7). It was found that there was significant association between obesity and the total severity score obtained, thus the severity of the disease is significantly higher among the obese patients compared to the non-obese patients. Also there was statistical association between obesity and the stiffness sub score but not with the pain and physical function sub scores. (Table 2).

Among the obese patients the social functions like indulging in leisure activities (87.5%), attending community events (37.5%) and place of worship (37.5%) were most affected. The major emotional problems among the obese were anxiety (100%), stress (100%), insomnia (62.5%) and frustration (62.5%) (Table 3).

Leisure activities were more significantly affected among obese (87.5%) when compared to non-obese (40.6%) with a p value of 0.02. Obese patients with OA had 10 times (O.R – 10.23, 95 % C.I:1-93) more risk of restricting leisure activities when compared to non-obese. Anxiety was also more prevalent among the obese (100%) patients than the non-obese (68.75%), but this difference was not significant. However stress was significantly present among the obese patients (100%) when compared to the non-obese patients (53.1%) (p value of 0.01). Hence, obese patients with OA were 15 times (O.R – 15.05, 95% C.I: 1-283) more stressed than their non-obese counterparts.
Discussion

In previous studies, it has been shown that prevalence of knee osteoarthritis increases with age, similarly in our study 65% of the patients were above 50yrs and 73% of the patients had more involvement of the knee joint. One study indicated that obese women had nearly 4 times the risk of knee OA compared to non-obese women; for obese men, the risk was nearly 5 times greater. Obesity is one of the few risk factors that appear to be important for both initiation and progression of knee OA and metabolic as well as mechanical factors mediate the effects of obesity on joints. Also, it has been estimated that persons in the highest quintile of body weight have up to 10 times the risk of knee OA than those in the lowest quintile which reflects the significant association between obesity and the severity score found in our study. Being overweight increases the load placed on the joints such as the knees, increases stress and could possibly hasten the breakdown of cartilage. Population-based studies have consistently shown a link between overweight or obesity and knee OA. Data also suggests that obesity precedes rather than follow knee osteoarthritis and weight loss prevents development of knee osteoarthritis. Hence, obesity being a major risk factor it is possible to decrease the burden of the disease by targeted intervention that aims at decreasing the net body weight.

Pain, functional disability and joint stiffness are common characteristics of patients with osteoarthritis. A significant association was found between joint stiffness and BMI and this finding should motivate physicians to persuade their patients to adopt weight reduction measures. Among the social problems, most patients had to mainly restrict their leisure activities, which was significantly more among the obese patients. Pain, fatigue and appearance issues could diminish positive self-image leading to preference for isolation and withdrawal from friends and social activities. This also influences ability to function at work. Morning stiffness, decreased range of motion, and other physical limitations may require modification of work activities and environment. Decreased ability to work can lead to financial difficulties leading to increased dependence on the spouse, a relative or a home healthcare provider causing loss of social control and anxiousness. Prolonged stress can lead to frustration, anger, hopelessness, and, at times, depression. The person with the illness is not the only one affected. Family members are also influenced by the changes in the health of a loved one.

Conclusion

OA is more severe in terms of joint stiffness among individuals with obesity. Obesity also causes more restriction of leisure activities and anxiety in the patients. This study could provide insight on the role of body weight in the severity of the disease and improving the quality of life.

Limitations

The major limitations of the study included the small sample size that gave wide confidence intervals and the diagnosis of case being depended on the practicing orthopedic surgeon. An intervention study looking at the role of weight loss in reducing the severity of OA is recommended.

End Note

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List of Abreviations

OA - Osteoarthritis
YLD – Years lost due to disability
BMI – Body mass index
WOMAC – Western Ontario and McMaster Universities Osteoarthritis Index
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References