VOLUME-8, ISSUE-1, JANUARY-2019 • PRINT ISSN No 2277 - 8160

Original Research Paper

Orthopaedics

STUDY OF RELATION BETWEEN OBESITY AND OSTEOARTHRITIS IN CENTRAL INDIA POPULATION.

Dr Brajesh Dadarya Associate Professor, NSCB Medical College, Jabalpur

Dr.Aditya Soni* Senior Resident, NSCB Medical College, Jabalpur *Corresponding Author

Dr. Ashish Sirsikar Assistant Professor, NSCB Medical College, Jabalpur

ABSTRACT

Background: Obesity is one of the most important risk factors for osteoarthritis (OA) in knee.

Objectives: To assess the risk of knee osteoarthritis (OA) attributable to obesity.

Methods: We evaluated total of 2526 patients aged between 42–85 years attending a hospital OPD. OA knee was confirmed in the suspected cases and their BMI measured. Obesity was defined by a body mass index (BMI) of 30 and above.

Results: Obesity was also significantly associated with knee OA . There was no statistically significant interaction effect between BMI and gender, age or any of the other confounding variables.

KEYWORDS :

BACKGROUND

Obesity is considered to be one of the most important risk factors for osteoarthritis (OA) in knee. Numerous longitudinal studies show a strong association between obesity, defined as a body mass index (BMI) above 30, and radiographic knee OA1,2,3,4,5,6. Case–control studies7 have consistently demonstrated a strong association between knee osteoarthritis and obesity.

However, the relationship between obesity and OA in hand(s) and hip(s) remains controversial.8 A significant relationship between obesity and radiographic hip OA has been found in some cross-sectional studies9,10,11,12,13 as well as in longitudinal studies14,15,16. But, some large cross-sectional studies have failed to show a significant association between obesity and hand OA in either males or females.[17,18,19]

Other established causes of knee osteoarthritis include constitutional predisposition to osteoarthritis in multiple joints (generalized osteoarthritis) and injury or surgery to the knee.1 It is possible that when obesity is present in combination with one or more of these risk factors, risk is increased to the extent that targeted advice on weight control would be appropriate The aim of this study was to investigate the long term impact of obesity for OA knee in a general population. The main hypothesis was that high BMI is a significant risk factor for OA in the weight bearing joints specially knee.

MATERIALS AND METHODS

All OPD patients with insidious and chronic knee pain were evaluated for their BMI. 2788 patients fell under this criterion of knee pain, of which 2526 consented for the study.

Each patient's case–notes and radiographs were reviewed to confirm the diagnosis of osteoarthritis, and to exclude those with underlying rheumatoid arthritis, ankylosing spondylitis, or injury or surgery to the knee within the past 12 months. The radiographic severity of osteoarthritis in the knee requiring surgery was graded according to the Kellgren and Lawrence classification.

All patients had their height measured (using a portable stadiometer) and weight (using electronic scales). A Heberden's node was defined as a palpable, tender or non-tender, bony swelling adjacent to the distal interphalangeal joint of a finger and was assessed using a three-point scale (none, possible or definite). If a clear swelling was palpable and felt to be bony, the node was assigned as definite predictor of OA.

For each case who was interviewed we sought a control of the same sex and matched as closely as possible for age, who had apparently normal knee. Association of knee osteoarthritis with obesity was evaluated.

The ethical committee approved the study.

RESULTS

Total of 2562 consenting patients were included. Of the 2562 cases who were included in the analysis, 1002 were men and 1560 were women. Their ages ranged from 42 to 85 y with a median of 72 y, and the ages of all controls were matched to within 2.5 years. In all, 78% of cases had a Kellgren and Lawrence grade of 3 or 4 in the knee. Of the remainder, 17% had Kellgren and Lawrence grade 2 osteoarthritis, 4% grade 1, and 1% grade 0.

The median BMI in the affected cases was 27.4 kg/m2 as compared with 25.1 kg/m2 in the controls.

Table 1 shows the distribution of cases and controls according to whether they were underweight (BMI<20.0 kg/m2), normal weight (BMI 20.0–24.9 kg/m2), overweight (BMI 25.0–29.9 kg/m2) or obese (BMI≥30.0 kg/m2), and the associated risks of knee osteoarthritis. Odds ratios increased progressively across these categories, more than a third of cases being classified as obese.

Table 1

BMI(kg/m2)	CASES		CONTROLS	
	n	%	n	%
<20	26	1	202	8
20-24.9	480	19	960	38
25-29.9	1182	46.8	1076	42.6
> 29.9	839	33.2	288	11.4

DISCUSSION

Our findings suggest that a large proportion of severe knee osteoarthritis is attributable to obesity. Various other studies done on similar lines too suggest the same.5,17 .The first National Health and Nutrition Examination survey conducted throughout the United States showed that women with a BMI between 30 and 35 kg/m2 had almost four times the risk of knee osteoarthritis of women with a BMI under [25.]

We studied cases from central India and recruited as many patients as possible. The response rate from potential controls was lower than for cases, but this is not surprising in an average patient base of elderly people. A potential source of bias was differences in recall between cases and controls. Another point to consider is that the association of obesity with knee osteoarthritis could have been exaggerated if some patients had put on weight as a consequence

of immobility caused by their disease.

CONCLUSION

Ultimately, confirmation of the benefits of weight control in reducing the occurrence and severity of knee osteoarthritis would best come from prospective intervention studies. Meanwhile, our findings give encouragement to public health initiatives aimed at reducing obesity, and identify certain groups of people who might be a focus for targeted advice. They also highlight a further adverse effect that can be expected if the prevalence of obesity in the general population continues to rise.

REFERENCES

1. Felson DT, Zhang Y, Hannan MT, Naimark A, Weissman B, Aliabadi P, Levy D: Risk factors for incident radiographic knee osteoarthritis in the elderly: the Framingham Study. Arthritis Rheum. 1997, 40: 728-733. 10.1002/art.1780400420
2. Spector TD, Hart DJ, Doyle DV: Incidence and progression of osteoarthritis in women with unilateral knee disease in the general population: the effect of obesity. Ann Rheum Dis. 1994, 53: 565-568. 10.1136/ard.53.9.565.
3. Hochberg MC, Lethbridge-Cejku M, Scott WW, Reichle R, Plato CC, Tobin JD: The association of body weight, body fatness and body fat distribution with osteoarthritis of the knee: data from the Baltimore Longitudinal Study of Aging. J Rheumatol. 1995, 22: 488-493.
4. Gelber AC, Hochberg MC, Mead LA, Wang NY, Wigley FM, Klag MJ: Body mass index in young men and the risk of subsequent knee and hip osteoarthritis. Am J Med. 1999, 107: 542-548. 10.1016/S0002-9343(99)00292-2.
5. Cooper C, Snow S, McAlindon TE, Kellingray S, Stuart B, Coggon D, Dieppe PA: Risk factors for the incidence and progression of radiographic knee osteoarthritis. Arthritis Rheum. 2000, 43: 995-1000. 10.1002/1529-0131(200005)43:5<995::AID-ANR6>3.0.CO;2-1.
6. Reijman M, Pols HA, Bergink AP, Hazes JM, Belo JN, Lievense AM, Bierma-Zeinstra SM: Body mass index associated with onset and progression of osteoarthritis of the knee but not of the hip. The Rotterdam Study. Ann Rheum Dis. 2007, 66: 158-62. 10.1136/ard.2006.053538.
7. Spector TD. The fat on the joint: osteoarthritis and obesity J Rheumatol 1990 17: 283–284.
8. Hochberg M: Osteoarthritis. Epidemiology of the Rheumatic Diseases. Edited by: Silman A, Hochberg M. 2001, Oxford: Oxford University Press, 205-229.
9. Cooper C, Inskip H, Croft P, Campbell L, Smith G, McLaren M, Coggon D: Individual risk factors for hip osteoarthritis: obesity, hip injury, and physical activity. Am J Epidemiol. 1998, 147: 516-522.
10. Hartz AJ, Fischer ME, Bril G, Kelber S, Rupley D, Oken B, Rimm AA: The association of obesity with joint pain and osteoarthritis in the HANES data. J Chronic Dis. 1986, 39: 311-319. 10.1016/0021-9681(86)90053-6.
11. Heliovaara M, Makela M, Impivaara O, Knekt P, Aromaa A, Sievers K: Association of overweight, trauma and workload with coxarthrosis. A health survey of 7,217 persons. Acta Orthop Scand. 1993, 64: 513-518.
12. Tepper S, Hochberg MC: Factors associated with hip osteoarthritis: data from the First National Health and Nutrition Examination Survey (NHANES-I). Am J Epidemiol. 1993, 137: 1081-1088.
13. Vingard E, Alfredsson L, Malchau H: Lifestyle factors and hip arthrosis. A case referent study of body mass index, smoking and hormone therapy in 503 Swedish women. Acta Orthop Scand. 1997, 68: 216-220.
14. Oliveria SA, Felson DT, Cirillo PA, Reed JI, Walker AM: Body weight, body mass index, and incident symptomatic osteoarthritis of the hand, hip, and knee. Epidemiology. 1999, 10: 161-166. 10.1097/00001648-199903000-00013.
15. Vingard E: Overweight predisposes to coxarthrosis. Body-mass index studied in 239 males with hip arthroplasty. Acta Orthop Scand. 1991, 62: 106-109.
16. Jarvholm B, Lewold S, Malchau H, Vingard E: Age, bodyweight, smoking habits and the risk of severe osteoarthritis in the hip and knee in men. Eur J Epidemiol. 2005, 20: 537-542. 10.1007/s10654-005-4263-x.
17. Davis MA, Neuhaus JM, Ettinger WH, Mueller WH: Body fat distribution and osteoarthritis. Am J Epidemiol. 1990, 132: 701-707.
18. Hochberg MC, Lethbridge-Cejku M, Plato CC, Wigley FM, Tobin JD: Factors associated with osteoarthritis of the hand in males: data from the Baltimore Longitudinal Study of Aging. Am J Epidemiol. 1991, 134: 1121-1127.
19. Hochberg MC, Lethbridge-Cejku M, Scott WW, Plato CC, Tobin JD: Obesity and osteoarthritis of the hands in women. Osteoarthritis Cartilage. 1993, 1: 129-135. 10.1016/S1063-4584(05)80028-7.
20. Carman WJ, Sowers M, Hawthorne VM, Weissfeld LA: Obesity as a risk factor for osteoarthritis of the hand and wrist: a prospective study. Am J Epidemiol. 1994, 139: 119-129.
21. Natvig B, Nessiøy I, Brusgaard D, Rutle O: Musculoskeletal symptoms in a local community. Eur J Gen Pract. 1995, 1: 25-28.
22. Natvig B, Bruusgaard D, Eriksen W: Localized low back pain and low back pain as part of widespread musculoskeletal pain: two different disorders? A cross-sectional population study. J Rehabil Med. 2001, 33: 21-25. 10.1080/165019701300006498.
23. Grotle M, Hagen KB, Natvig B, Dahl FA, Kvien TK: Prevalence and Burden of Osteoarthritis: Results from a Population Survey in Norway. J Rheumatol. 2008, 35: 677-684.