

Case Report

Management of Knee Osteoarthritis (OA) in an Elderly Obese Women with Zero Cost: A case report

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Abstract

Osteoarthritis (OA), sometimes called degenerative joint disease or 'wear & tear' arthritis, is the most common chronic condition of the joints. Evidence of strong association of OA with increasing age, obesity and female sex is proved in various studies. Knee OA can be diagnosed clinically by using ACR (American College of Rheumatology) criteria for knee OA without any investigation cost. Weight reduction is the principal modality in prevention and treatment of knee OA particularly in obese women which usually needs no cost at all.

Keywords: Knee OA (Osteoarthritis), Elderly obese, Women, ACR criteria, Zero cost, OARSI

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Introduction

Osteoarthritis (OA), the most common form of arthritis, is a slowly evolving, degenerative disease affecting cartilage and bone. Cartilage provides a smooth gliding surface for joint motion and acts as a cushion between the bones. In OA, the cartilage breakdowns, causing pain, swelling and problem moving the joint. As OA worsens overtime, bones may break down (microfracture) and develops growths called spurs. In the final stage, the cartilage wears away and bone rubs

against bone leading to joint damage and more pain. It may affect large joints like hip, knee and small joints like CMC (Carpometacarpal), MCP (Metacarpophalangeal), PIP (Proximal interphalangeal), DIP (Distal interphalangeal) joints. Regarding etiology, it appears multifactorial. Nonmodifiable factors include increasing age, female sex, genetic predisposition, previous joint injury etc. One of the best studied potentially modifiable risk factors is obesity. Obesity may play a role of double edged sword. Mechanical stress in one edge and metabolic effect in another edge.

A population study in postmenopausal women showed the risk of knee OA increased by 35% for every 5 kg of weight gain¹. There is lack of data examining the effect of weight loss in subjects who have established disease, although one population based study suggests that the risk could be halved by losing weight². OARSI (Osteoarthritis Research Society International) recommended weight reduction and maintenance of weight at lower level for hip and knee OA in obese patients³. Degeneration of joint cartilage is a natural phenomenon of aging process in both sexes but surprisingly more in women. Knee OA is very common in clinical practice and often bilateral. One in two adults will develop symptoms of knee OA during their lives⁴. We report a case of knee OA in an obese postmenopausal women who belongs to low socio-economic status and financially insolvent to bear any cost of treatment.

Case report

We present the case of a poor women of 55 years old, obese, housemaid having bilateral knee pain and swelling for 5 years with waxing and waning course. She is nondiabetic, hypertensive and having no other co-morbidities except GU (gastric ulcer). She visited to several physician including physiotherapist in last 5 years where she treated conservatively in the form of various NSAID, tramadol, steroid, calcium, glucoseamine-diacerine combination but all in vain. Rather she developed NSAID gastric ulcer (GU). She also took antihypertensive irregularly. She lost the job 2 years back as she could not work properly due to her knee pain. She had no history of trauma to her knee joint and no positive family history. Finally she came to orthopedic out -patient department in January 2015 with no money in hand. She maintained the treatment cost by borrowing money from others in last two years.

On examination, there was mild to moderate joint effusion and joint line tenderness in both knee, crepitus on knee motion, no involvement of any other joints, absence of Heberden's node (in DIP joint) and Bouchard's node (in PIP joint), ROM (Range of motion) of both knee joints slightly restricted due to pain and effusion. Her body weight was 80 kg, height 1.6m, BMI 31.25 kgm-2(normal range 18.5-24.9 kgm-2), BP150/90 mm Hg and other vital parameters were within normal limit. Her previous investigation reports that she had done 2 years ago revealed RA test and anti CCP negative, S. Uric acid normal, x-ray of both knee joints showed joint space diminished, bone spur, marginal sclerosis and subchondral cyst.



Figure: X-ray right knee joint A/P view showing radiological evidences of osteoarthritis i.e joint space narrowing, bone spur, marginal sclerosis

She was unable to do new X-ray or any further test because of financial crisis. According to ACR (American College of Rheumatology) criteria for OA knee we diagnosed her as a case of bilateral OA knee with HTN with NSAID induced GU. We were in great trouble during prescribing drug for her treatment. NSAID could not be prescribed due to GU and she could not tolerate tramadol due to severe vomiting. Moreover, she had no money to buy any drug. She refused to do joint aspiration and intra articular steroid injection either due to needle phobia or due to having no money. And we could not consider any surgical approach for such a poor woman. When all hopes regarding medical and surgical treatment options were losing and we were getting frustrated, then we thought about risk factor modification. Her risk factors were increased age, female sex, obesity and occupation. Among these potentially modifiable risk factors were obesity and occupation. So she was advised to reduce her body weight 15-20 kg by controlling diet. In this regard she was referred to diet and nutrition department for a weight reducing diet chart. She was also advised to avoid kneeling, squatting, climbing upstairs, weight lifting/ carrying and to do quadriceps exercise regularly. She was not prescribed any medicine. After 6 months, the patient came for follow up. By this time, her body weight was reduced by 5 kg and her symptoms were gradually diminishing.

In January 2016, she again came with bilateral knee pain and swelling without any H/O trauma. We found her 79 kg in weight machine which meant she gained 4 kg weight in last 6 months. On query, she confessed that she could not maintain the diet chart in last 6 months. Then she was counseled again about the necessity of diet chart and weight reduction, discipline about position and posture during daily activities and

quadriceps exercise for the treatment of knee OA. And she agreed to follow the instructions and discipline. In July 2018, she came to out-patient department with a smiling face and painless knee joint for giving thanks to the doctors. She had been following the diet chart, instructions regarding position and posture and knee exercise strictly for last 2.5 yrs. She had lost 15 kg weight by this time and her BMI became 25.39 kgm^{-2} which was 31.25 kgm^{-2} 3 yrs ago. Moreover, she became normotensive from hypertensive patient without any drug. She was astonished at the result of treatment which required no drug, no invasive procedure or surgery and almost zero cost.

Discussion

The patient's body weight has played significant role in development of OA knee. Excess body weight has double impact in causation of OA. One is mechanical and another is metabolic. Excess weight causes mechanical stress across the weight bearing joint like knee, could induce cartilage breakdown simply on the basis of excess force which then lead to OA. Overall force across the knee and hip are approximately 2 to 3 times body weight during walking. Therefore, every pound of weight can be multiplied by this factor to determine its effect on knee forces. In certain positions, such as kneeling, squatting, climbing stair, getting up out of chair, knee and hip forces are over 3 times body weight and during these activities, each pound of excess weight exerts its force according to this even higher multiplier.

Metabolic effect of adiposity in development of OA is still not clear. Obese postmenopausal women have higher circulating estrogen levels than thin women which may increase bone density and possibly increase the risk of OA.

According to Framingham OA² study for women whose baseline BMI value were at least 25 (over the median) weight loss lowered the rate of knee OA. How much disease might be prevented if obese people lost weight? The Framingham OA study had shown women, if those were in the highest weight group (BMI>29) dropped into the over wt group (BMI of 25-28.9) and those in the overweight category dropped into the reference group (BMI< 25) the total rate of knee OA would decrease by 33%.

In a recent report from the Framingham study, for every 10 lb increase in weight, the odds of developing radiographic OA increased by 40% with a commensurate decrease for 10lb weight loss. This effect of weight change was seen in women and not in men⁵.

The patient had other risk factors like increased age, female sex which are non-modifiable. Age related degeneration of joint cartilage and bone is natural occurrence. The relationship between obesity and knee OA is much stronger in women than men which has mechanical explanation. The increased joint stress in knee of obese men could be deflected by their stronger muscle than women or force could be distributed over a greater knee area, leading to less joint stress in men than women⁶.

The patient was too poor to bear the cost of any further investigation, even she had no money to buy any drug. Actually knee OA can be diagnosed clinically by ACR criteria without any cost of investigation. Presence of knee pain along with at least 3 of the following 6 items confirm the diagnosis.

- i. Age>50 yrs.
- ii. Morning stiffness <30 min.

- iii. Crepitus on knee motion.
- iv. Bony tenderness.
- v. Bony enlargement.
- vi. No palpable warmth.

For treatment she had not to spend any money in last two years. She just maintained a low caloric diet chart for weight reduction and followed the instructions about position and posture during daily activities like avoid kneeling, squatting, climbing upstairs, wt lifting/carrying. In addition to these she did regular quadriceps exercise to increase the muscle power around knee. Treatment cost was nothing rather she had less cost for food expense than earlier as she ate less rice, more vegetables and avoided sugar. Moreover her BP came to a normal range without drug which was previously uncontrolled in spite of using antihypertensive drugs^{6,7}.

Conclusion

Money expenditure is a matter of great concern for diagnosis and treatment of any disease particularly among the poor patients. Fortunately, OA knee can be diagnosed clinically by using ACR criteria without any cost of investigation. We can avoid or delay the use of drug, invasive procedure or surgery for treatment of OA knee by using some simple conservative ways in early stage without any cost. These include weight reduction, position and postural modification during daily activities and regular quadriceps exercise. A modest amount weight loss 10-15 lb is likely to alleviate symptoms and delay disease progression in patient with knee OA. Moreover, it contributes to prevention and treatment of HTN, dyslipidemia and other metabolic disorders. Further benefits of these are no drug related side effect eg. NSAID induced gastric ulcer and

nephropathy, steroid induced osteoporosis and cataract, no complication of surgery and it needs almost zero cost.

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