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Risk factors, burdens and management of osteoarthritis: A review

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Abstract
Osteoarthritis is chronic degenerative disease of the joints with major clinical features as joint pains and stiffness, leading to decline in physical activities. It is most common musculoskeletal disorder affecting millions of people. Age, sex, genetics factor, obesity, nutritional factor, bone mass, joint associated risk etc. are the major risk factors of osteoarthritis. Disabilities, mortalities and economic burdens are the impact of osteoarthritis. This article explains various risk factors, socio-economic burdens and prevention and management methods of osteoarthritis

Keywords: Osteoarthritis OA, Body mass index BMI, Cardiovascular disease CVD, Non-steroidal anti-inflammatory drug NSAID

1. Introduction
Osteoarthritis is chronic degenerative disease of the joints with major clinical features as joint pains and stiffness, leading to decline in physical activities [1]. Osteoarthritis is most common musculoskeletal disorder and it became the fourth leading cause of year lived with disability in world wide. It mainly affects the hand and large weight bearing joints, such as the knee and the hip. Its prevalence's increases with progression of age, frequency of occurrence is more in women than men. Aetiology of osteoarthritis is multifactorial; age, sex, genetics factor, obesity, nutritional factor, bone mass, joint associated risk etc. Early detection and education of patient helps to prevent progression of damage at same time improve lifestyle of society also reduce financial and social burdens [2].

Risk Factors of Osteoarthritis
Personal Level Risk Factors
1. Age: It is important risk factor for OA. Ageing mainly affects the ability of joint to protect itself from biochemical stress, sometime it may be due to changes in articularcartilage. As progression of age chance for getting OA is very high [3].

2. Genders: Women's are more chance for getting osteoarthritis as compared to men. Risk will be high at stage of menopause. Estrogenic supplementation was found to be significant role to decrease rate of osteoarthritis (hip, knee) [3].

3. Obesity: Obesity is modifiable risk factor for osteoarthritis. Obesity increases the progression of disease especially in the case of knee and hip. Weight reduction can improve the pain and functioning of joints. Therefore, weight reduction can lower the disease burden and morbidity associated with osteoarthritis [3].

4. Genetics: Heredity character has got very strong association for the development of osteoarthritis. From studies, it is shown that expression of micro RNAmiR-127-5p was observed in knee osteoarthritis [4].

5. Diets: Low level of vitamin D, C& k are the common risk factor for the development of knee OA.
Because of antioxidant effect of micronutrients provide protection against tissue injury [4].

Joint Associated Risk
1. Anatomical Abnormality: Hip osteoarthritis is more linked with local anatomical abnormalities than knee osteoarthritis [4].

2. Injuries: It is one of the commonly seen risk factor OA especially for knees, mainly due to meniscal damage, direct injury of articular cartilage. Occupational knee OA and previous history of knee injury are the serious risk factors [4].

3. Jointloads And Alignment: Misalignment of metatarsophalangeal joint is associated with osteoarthritis of metatarsal, knee and hip joints [4].

4. Occupation and Activites
Physical activity and OA is highly linked to each other. Person with repetitive and high impact of physical activities has high risk of getting hip and knee OA. Person with higher level of participation in sports also reason for OA [4].

The Burdens of Oa
Disability: Limitation in various activity particularly in walking, carrying object, difficulty in dressing are serious burden of OA, because of that human assistance is essential for arthritic patient. Therefore, to reduce the burden, promote the use of assistance device such as walking aids [5].

Mortality: Patients with OA have higher risk of mortality than normal population. The major cause of mortality is due to CVD including respiratory disease, hypertension, high cholesterol levels, low high-density lipoprotein levels, renal impairment and diabetes, dementia. CVD IS usually seen in patient with severe walking disability and women with hip OA due to less physical function. Therefore, health care professional should give more attention to decrease walking disability by promoting use of walking devices, rehabilitation programs also through joint replacements [5].

Economic Burden: OA becomes major public burden in our society. The economic impact of OA mainly includes direct and indirect cost. Direct costs include cost of drugs, medical care, hospitals and research, and indirect costs include lost work productivity due to chronic or short-term disability [6].

Prevention and Management
OA patients have to suffer pain and loss of function. The main aim of OA management is that to reduce the level of pain, inflammation, disability and slow down degradation, also improve the function. Among these prevention is better than management [7].

Primary Prevention
1. Weight control: BMI>30kg/m2 can be considered as obesity, it becomes one of the major risk factor. Reduction of weight through diet and physical exercise can lower the risk of developing OA.
2. Occupational injury prevention: Avoid repetitive joint injury
3. Sports injury prevention: By taking necessary prevention such as warming ups, use of proper equipment's to reduce injury.
4. misalignments: Improper alignment lead to OA, through proper treatment like orthotic or bracing decrease risk [7].

Secondary Prevention
Secondary prevention helps to early diagnosis and to minimize disease progression at early stage by the use of biochemical markers [7].

Tertiary Prevention
The main objective is that
1. minimizes the complication of disease.
2. Improve the quality of life.
3. lower the level of pain and disability [7].

Management
Non-Pharmacological Therapy
- **Education**

Patient education is important part of management. Health care professional should give idea about different aspects of disease process, benefits and risk of treatment [8].

- **Reduction Of Adverse Mechanical Factors**

Obesity is one of the modifiable risk factor for the development and progression of knee and hip OA, because of that weight reduction is effective in the prevention of primary and secondary OA. Weight reduction improves pain and functioning of joints, it mainly achieved by diet control and regular exercise. Patient with lower limb osteoarthritis should use footwear, raised heels are completely avoided [8].

- **Assistive Device**

Assistance device such as cane, wheeled walkers help to reduce the mechanical loading and pain in patient with knee, hip OA. They should be educated about proper use of cane. Knee brace can be recommended to patient with OA and also in the case of mild to moderate valgus misalignment [8].

Ice and heat treatment
Periodic application of heat and cold treatment is commonly recommended in combination with other treatment especially for the patient with knee OA, and is found to be safer and more economical. Cold treatment is useful after exercise and in acute phase of pain, which reduce the inflammatory oedema and further damage. Heat treatment mainly recommended after the stabilization of initial swelling and oedema phase [8].

Therapeutic Exercise
Therapeutic exercise is the form of physical activity which mainly done under the presence of appropriative health care professionals for obtaining specific treatment goals.
Benefits of physical activity and exercise
1. It slows down disease progression, which increases the rate of remodelling, muscle strength.
2. It helps in reducing pain
3. It improves the functional limitation by improving walking speed.[8]

Non-Steroidal Anti- Inflammatory Drugs
Pharmacological approach of symptomatic treatment helps to control joint pain and improve joint function. It mainly includes oral administration of paracetamol, NSAID, opioid intra- articular corticosteroid injection [8].

Surgery
Patient who suffer persistent pain and reduced function of joints are more preferred for joint replacement surgery. Most of patients undergo total knee arthroplasty to improve the function and reduce the symptoms [8].

Conclusion
Osteoarthritis is chronic degenerative disease of the joints. It

mainly affects the hand and large weight bearing joints, such as the knee and the hip. It prevalence's increases with progression of age. Its frequency of occurrence is more in women than men. Obesity is also a reason for the progression of disease. Person with repetitive and high impact of physical activities has a high risk of getting disease. Pain, limitation in functioning of joints, higher risk of cardio vascular diseases, and increased economic costs are the major burdens of osteoarthritis. so prevention methods such as weight control, prevention from occupational and sports injuries are primary steps to avoid disease. For the managements, non-pharmacological methods such as patient education, use of assistance device, Cold and heat treatment, therapeutic exercise under the guidance of health care professional, pharmacological treatments, some severe cases surgeries also useful

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