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Osteoarthritis: The Major Contributor of Total Knee Replacement

[1]Maria George, [2]Akshaya Shaji, [3]Chitra Jacob, [4]Indhu Jayadas, [5]Kalana Kabeer

[1]Asst.prof.Dept of pharmacy practice,St.James College of pharmaceutical sciences (NAAC Accredited),Chalakudy,KUHS University,Kerala ,India
[2], [3] , [4]PharmD student,St.James College of pharmaceutical sciences (NAAC Accredited),Chalakudy,KUHS University,Kerala ,India
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ABSTRACT
Osteoarthritis is the most common form of arthritis and a leading cause of chronic disability largely due to knee or hip involvement .The social burden of osteoarthritis(OA) relates to its pervasive presence. The review also illustrate that the incidence elevates globally and prevalence increases progressively that OA is an global burden to economic and social life. The risk factors which mainly contributes its progression includes age and obesity being the major ones ,the Knee osteoarthritis is the most common Osteoarthritis affecting people worldwide and total knee arthroplasty (TKR) being the most effective and safe surgical intervention for the endstage Knee Osteoarthritis.
KEYWORDS: Osteoarthritis, total knee replacement, Quality of life

I. INTRODUCTION:

Osteoarthritis being an increased burden for the public health as progression of the OA largely affects the quality of life of the patients as it progresses to the end stage. The increase in the prevalence of the symptomatic OA with age coupled with inability of symptom relieving or disease modifying disease contributes to its impact.

A better understanding of the factors that contributes to the disease and disability in OA is a high Priority among the surging population being affected worldwide and Knee osteoarthritis more than 400million people worldwide.

Epidemiological studies in addition to the incidence and prevalance studies has provided information to aid the performance and interpretation of several clinical trials in which a heterogeneous disease like OA is a disease which are results of both mechanical and biological events that destabilizes the normal coupling of degradation and synthesis of articular chondrocytes. OA is manifested by all morphological biomechanical, and biochemical pathology leading to softening ,fibrillation,ulceration, loss of articular cartilage,sclerosis,and osteophytes formation.

Clinical evident signs of OA include joint pain, tenderness, limitation of movement, which mainly aggrevates the poor quality of life of the patients presenting with OA and which have poor response to the medication indicative of the endstage osteoarthritis a leading causative agent of total knee arthroplasty. The advanced and disabling stages are the main indication for the total knee arthroplasty (TKA); a clinically safe and effective surgical interpretation for correcting severe knee osteoarthritis ; the common type of osteoarthritis.

The postsurgical recovery and enhanced activity depend on the pain ,stiffness and functional status of patients measured with a disease specific questionnaire tool like the WOMAC (Western Ontario and Mcmaster universities osteoarthritis Index) which leads to a positive outcome compared to that of preoperative record with emphasis on maintaining the BMI which is mainly indicating the obesity indicating that the sociodemographic and clinical factors influence the outcome.

II. EPIDEMIOLOGY OF OA:

The incidence of OA progresses overtime and The incidence of the disease progression was calculated using the equation:

Incidence = Annual number of new OA cases÷ Mid-period population

The incidence rates increased 2.2 – 4% annually globally due population growth and ageing .

OA prevalence increased monotonically 91.6 per 1000 persons to 111.6 per 1000 persons but unanimously genderwise with greater prevelance in women .While the age 60 -79 showed peak number of persons affected and comorbidity wise hypertension recordically higher than chronic kidney disease(CKD) and Diabetes followed with osteoporosis, rheumatoid arthritis ,psoriatic arthritis and ankylosing spondylitis consecutively among the bone disorders.

The geographic variation also contributed the results that rural area have more prevelance compared to the urban and is influenced by socioeconomic considerations ,physical overload, lifestyle.

Correlation data for epidemiological finding interpret that women are more affected and burdened by OA than men after menopause specifically.

III. RISK FACTORS INVOLVED:

AGE:

Age is an non modifiable risk factor for OA where muscle weakness including weak quadriceps,oxidative damage, cartilage thinning are the major reasons for OA along with the increased physical labour.

Sarcopenia (age related reduced muscle mass and strength) may coexist with endstage OA result in significant reduction in function or causes inactivity which may lead to a sedentary lifestyle and may cause the patient to gain weight along with enhanced adipose tissue gain during age.

GENDER:

The women is more affected than men by osteoarthritis and incidence which support this in menopause .However underlying reasons can quote difference in the muscle strength, body mass and hormonal changes.

OBESITY:

Measured in terms of BMI ;an direct proportionate association is obtained with increased risk of knee OA –for every 5% increase in BMI the risk increases 35%.A strong association existed for women than men. Hence an overweight or obesity is leading cause for elevated pain and thus reduction of the same and maintenance of ideal bodyweight is important even after the TKA.

KOA is more significantly and strongly associated with obesity rather than hip osteoarthritis.

GENETICS:

Genetic factors may account for 40% KOA and 60% of hip or hand osteoarthritis .Major pulling factor being any defective coding of gene viz. type 2 collagen or vitamin receptor coding gene.

TRAUMATIC INJURY:

ACL (Anterior cruciate ligament) tear leads to early onset knee osteoarthritis eventhough the ligament reconstruction improves the function if presented particularly along with meniscal repair.

MALALIGNMENT:

Anormal varus alignment corresponds to increased progression for OA along with valgus alignment.Both alignment corresponds to increased risk.

CONSEQUENCES OF OA

OA is the 11th most burden according to 2010 WHO global burden studies as it is responsible for major limitation of activities like walking ,difficulty in day to day life functioning.

Greater risk of mortality and affecting the persons psychological level along with economic burden irrespective of their improvement after TKR .

END STAGE OA AND TKR

TKR (Total knee replacement) is the surgical intervention to be considered after significant pain ,deformity ,functional loss with restricted range of motion or joint instability occurs significantly at the endstage of the knee osteoarthritis.

TKR involves fixating an interface between metallic or plastic implants trough surgery. Arthroplasties are considered maybe of excisional, partial or total arthroplasty of which total joint replacement is the most economic , moreover a consistent and dependable operation after careful evaluation of all possible interventions that can be made. The longterm outcomes and benefits of the surgery is widely contributed by the physiotherapy, rehabilitation and education given to patient regarding the risks and the benefit of the procedure which showed incredible increase in the health related quality of outcome of patient assessed through WOMAC Scale and SF-36(short form -36) questionnaires which showed an 39..9 to 77.1 % increase for WOMAC score assessed through a 3 year gap and the SF36 physical Score of 32.5 in non TKR patients and 30.1 in TKR patients implied that TKR had a positive effect on quality of life of patients it has performed.

IV. CONCLUSION:

The comprehensive review records that the Major contributor of TKR was found to be osteoarthritis particularly knee osteoarthritis affecting 40Million people worldwide. The primary risk factors which results in the osteoarthritis and leading to the endstages in majority population was found to be ageing which was an nonmodifiable risk factor along with obesity calculated by the BMI which adversely worsens the knee conditions and affect the physical and social functioning followed by less severe but contributors like malalignment and gender with a female predominance over male population. The main comorbidity that was found to be tagging along with OA as found to be Hypertension and of musculoskeletal disease was osteoporosis.The TKR procedure undergone by patients whom showed an increased quality of life with overall improvement in physical and psychological functions assessed via the WOMAC and SF-36 score interpretation.

In Conclusion, Understanding the main risk factor contributing to osteoarthritis and evaluating the possibilities to enhance the patient Quality Of Life after considering all surgical and nonsurgical possibilities followed by correct selection of the resolution in the severe conditions showed majority people choosing TKR and that OA is the predominant reason for the end stage limitations in the activity and clinically presented pain existed in the patients.

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