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OSTEOARTHRITIS OF THE KNEE JOINT IN ALNAJAF

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Abstract

A prospective study on a sample of patients living in Alnajaf,related to osteoarthritis of the knee and some factors affecting it. The objectives of this study is to find the relation between age, sex and overweight to osteoarthritis of the knee joint. Between Nov. 2000 and Nov. 2002, all the patients attended the teaching hospital in AlNajaf, complaining of knee pain were clinicaly examined. Those who proved clincaly to have primary (idiopathic) osteoarthritis of the knee joint were included in this study. From those patients a sample of 126 patient were further investigated; The body mass index of each was calculated from their weights and hights. Bilateral weightbearing x-ray of the keens were taken to see the radiological features of osteoarthritis in details. Total number of patients was 730, 606 females and 124 males .The ratio of females to males was 4.8:1.The mean age of the females was 54.7 years and of the males was 60.6 years. For the sample of 126 patients the mean body mass index of the females was 30.5Kg/m^2, and of the males was 27.5 Kg/m^2. They were 61 obese, 55 overweight and 8 patient with accepted weight. Decrease joint space especially on the medial compartment was the most common radiological feature, followed by the sub-chondral sclerosis which occurred mainly on the medial compartment, and osteophytes occurred mainly on the lateral compartment. In conclusion: Idiopathic osteoarthritis of the knee occur more in women.Age and overweight has a direct effect on the development of primary osteoarthritis of the knee joint.

Introduction

The first decade of the new millennium has been designated "Decade of the Bone and joint " by the World Health Organization, United Nations and other organizations involved with musculoskeletal disorders[1]. From this statement one can conclude that musculoskeletal disorders will occupy a wide range of importance so that a new understanding of their pathogenesis and management is important.

Osteoarthritis (OA) in general is the most prevalent rheumatic disorder affecting the musculoskeletal system[1-3].

In the United States, OA runs a close second to ischaemic heart disease as a cause for disability[2]. The knee joint is the main joint that is affected by this disorder and osteoarthritis of the knee is a common disease[1,4-6].

Epidemiological studies revealed a relationship to aging, obesity and to overuse of the joints, especially in certain occupations[1-3].

Degenerative changes of the joints may begin as early as in the second decade of life. Radiologicaly the disease is present in almost all persons aged 65 years and older[2].

There are two types of osteoarthritis; primary and secondary. In the primary (idiopathic) OA the cartilage fails with no recognizable hereditary defect, no metabolic or endocrine abnormality and no history of injury but there are strong argument for primary OA being age related. On the other hand secondary OA is mostly due to mechanical disorders of the joint, injuries, infection, metabolic disorders, or other dysfunctions[2,6].

The pathogenesis of OA starts by increase in the synthesizing activity of chondrocytes. Simultaneously an intense catabolic state forces the degradation of proteoglycans and collagen by an excessive release of lysosomal and non-lysosomal enzymes. The elastic properties of the hyaline cartilage are lost with the initial structural change, nutrient diffusion deteriorates, and the load bearing capacity of the cartilage decreases[2].

Clinically, the main presenting features are pain, swelling, limitation of motion and stiffness of the joint[2,5].

Radiologicaly the following features occur: Joint space narrowing which is the result of cartilage destruction, New bone and cartilage formation in non-stressed area and at joint margins, which is, called osteophytosis, Sub-chondral sclerosis, which is due to stress induced new bone formation and trabecular collapse, Cyst in the subarticular regions found in the weight bearing areas[1,5-7].

Treatment of osteoarthritis depends on the stage of the disease. Experimental trial of cartilage grafts applied to the articuler defects gave good results in the early stages of degenerative arthritis[3].

For the established cases of osteoarthritis the main treatment consist of using analgesics for pain, modification of the activity and exercises, the last of which are very important and excellent treatment alternative[1,3,4,8-10]. If the previous measures became not effective one can shift to use the non-steroidal anti-inflammatory drugs "NSAIDs", the main side effects of which are stomach pain and G.I. bleeding[1,3-5,11-14].

The new cyclo-oxigenase (COX)–2 selective non-steroidal anti-inflammatory drug, appear to cause fewer adverse gastrointestinal events than standard, non–COX-2 selective "NSAIDs"[14-16].

Intra-articular injection of gluco-corticoids gives benefit in cases of acute exacerbation and it last for less than 3 weeks[1,17-19].

Recently, intrarticular injection of hyaluronic acid found to relieves pain and improves function of the joint in the early stages of the disease[4,10,20-22].

Operative treatments includes arthroscopic debridment , arthroscopic lavage, corrective osteotomy of the upper tibia and lastly joint replcment procedures which offer excellent long term results and makes arthrodesis less attractive and now rarely used[1-5,17,18,23,24].

In this study we try to answer many questions about OA of the knee and look for the factors that directly affect this common disease.

Material and method

Between Nov. 2000 till Nov. 2002, all the patient who they attended the orthopedic clinic in the teaching hospital in Al-Najaf, complaining of knee joint pain were clinicaly examined. Those who fit the criteria for the classification of idiopathic osteoarthrits of the knee, developed by the American college of rheumatology were included in this study depending on clinical findings[25]. The data about those patients included the age, sex, occupation, address and for the females the marital status and gravidity.

During the first six months, and after taking their permission, the patients were investigated (as random sample) by taking bilateral anteroposterior wieght bearing x-ray of the knees. The height and weight of each patient used to calculate the body mass index (BMI) which is equal to; weight in Kg divided by the sequare height in meters. Patients were divided into 3 groups according to BMI. Those with BMI less than 25 has ideal weight, those with BMI from 25-30 are

overweight, and those with BMI over 30 are obese[26].

Their radiographs were read for the presence of osteoarthritis using the Kellegran-Lawrence grading system (grade 0: normal, grade one: minute osteophytes of doubtful significance, grade 2: definte osteophytes, grade 3: moderate narrowing of joint space, grade 4: greatly reduced joint space and subchondral bone sclerosis[27]. Those with grade 0 and 1 were excluded.

Results

The total number of the patient who proved to have primary osteoarthritis was 730 patient. They were 124 men (17%) and 606 women (83%) and the male to female ratio was 1:4.8.

The mean age of all was 57.6, for men it was 60.6 years ranging from 46-87 years, and for women was 54.7 years ranging from 40-85 years.

Age groups in decads were as follow: (37%) in the fifth decad, (37%) in the sixth decad, (21%) in the seventh decade and (4.5%) in the eighth decade. 60% of the patients came from urban areas and 40% from rural areas.

Regarding occupation, housewives represent (61%) of the cases, farmer represent (22%), and the rest (17%) practice different types of jobs as teachers, drivers, employer and free jobs. The main complains of the patient was pain of the knee with activity, about (40%) of them were complaining of night pain in one or both knees. Regarding the females almost all of them were married, the mean gravidity was 9.4 ranging from (0-18).

The sample of patients investigated by X-ray in the first sixth months, and proved to have primary osteoarthritis of grade 2 and over were 126;18 grade 2 with mean age of 53.5 year and BMI of 29.2, 38 grade 3 with mean age of 54.3 year and BMI of 30.9, and 70 patient grade 4 with mean age of 55.3 year and BMI of 30.5.For the whole group the number of obese were 61 representing 48% of the cases, the overweight were 55 representing 44% of the cases, and the patients with ideal weight were 10 representing 8% of the cases.

The number of women was 106 and the number of men was 20. The mean height of the women was 154cm, the mean weight was 73.5kg and the mean BMI was 30.5.The mean height of the men was 167cm, their mean weight was 82 kg. And the mean BMI was 27.5(Table I).

In X-ray films, the osteophytes were seen in the periphery of the lateral compartment more than the medial. Subchondral sclerosis were seen in the medial compartment more than the lateral. Subchondral cyst was seen in few cases. The mean joint space on the medial compartment was 1.62 mm. and on the lateral compartment was 4.36 mm. Regarding the tibiofemorale angle we found that the angle was less than 4° (varus) in 37% of the knees, and more than 8°(valgus) in 3.5%. The rest were between 4-8 degree which is regarded normal.The mean angle for all the patients was 4.6 degree.

Discussion

Osteoarthritis of the knee is a common disease[1,4-6]. From this work it was clear that the number of patient who were complaining of OA of the knee is increasing with time, but the exact incidence of OA of the knee in al Najaf is not clear because our clinic is not the only one which deal with this problem in this city. In Saudi Arabia the incidence was estimated to be 3.5% in primary health care center. In North America it was estimated to be 6% in adults over 30 years of age[1]. Whatever the incidence was, I think that we are facing one of the important and big problems, which affect adults aged above 40 years in our population.

The main factors which affect this problem include obesity, sex, grand multiparty, genetics, bone density, hormone replacement therapy and racial characteristics[1].

Obesity has been found to be a major factor in O.A. of the knee[1,5,6,28-30].

The way of sitting in eastern countries may be contributive[1]. The level of physical activity of the patient may also affect the disease[31].

In this paper we found that 48% of the patient were obese and 44% of them were overweight while only 8% of the patient had accepted weight. It is clear that the weight has direct effect on the development of OA of the knee.

Regarding gender we found that female were affected more than males and the ratio was 4.8:1 and for comparison the ratio of female to male was 4.1:1 in the Ivory Coast[32], while it was 2.6:1 in one study from Germany, and in Saudi Arabi it was 1:1[27,32,33].

In this study the mean BMI in female was 30.5Kg/m^2 while it was 27.5Kg/m^2 in males and this may explain in part why the incidence is more in women than in men. Another factor is multi gravidity were the mean was 9.4 in our sample and that may add another burden on females who they develop OA more than males.

The age is important factor in primary OA of the knee[1,3,5,31]. In his paper "pathogenesis of osteoarthritis" Fritz U Neithand said "By age 40, almost all people show some degenerative changes of the cartilage in their weight bearing joint. In radiological studies, the disease is present in almost all persons aged 65 years or older"[2].

The mean age of the patients in this study was 57.6 years; it was 54.7 years for women and 60.6 years for men.

For comparison the mean age of the patients in KSA was 57, in the Ivory Coast was 57.8 years and in Germany was 66.3 year[32,33]. This may confirm the believe that the disease is age related.

The results in this study are comparable to those from Saudi Arabi as seen in table II. The conclusion about the sample of KSA patients was that there was a strong association between radiographic OA and obesity in females.In males the association between body weight and knee OA was also present although less marked[27].

These results about OA of the knee are seen in many studies all over the world, but there are many questions which needs answers.Why obesity affect the knee while other weight bearing joints are not affected in the same way like the hip and the ankle? If it was age related why the other jionts including those of the lower limb are not affected equaly? What is the role of sex of the patient and if it was hormon related why the knee and not other joints?I think that the secret is hidden inside the knee. we conclude idiopathic OA of the knee affects woemen more than men.It appears to be age related.Obesity may be one of important factors responsible for development of OA of the knee.In future we may be able to control aging processes,but for the moment it is important to educate public about the morbidity of obesity which include a long list of dangerous diseases not least OA.

Table I: Comparison between males and females in the sample

Sex	**Males**	**Females**
Number of patients	**20**	**106**
Percentage	**15.8%**	**84.2%**
Mean age in years	**60.6**	**54.7**
Mean hight in cm.	**167**	**154**
Mean weight in kg.	**82**	**73.5**
Mean body mass index kg/m ^{2}	**27.5**	**30.5**

Table II: Comparison between results from KSA and present study

Data	Study from Ksa	Present study Iraq
Total patient	**113**	**126**
Females	**56**	**106**
Males	**57**	**20**
Mean age/all	**57**	**57.6**
Mean age /females	**53**	**54.7**
Mean age /males	**60.3**	**60.6**
No.of ideal weight	**23(20.4%)**	**10(8%)**
No. Of over weight	**3732.7%)**	**55(44%)**
No. Of obese	**53(46.9%)**	**61(48%)**
Mean bmi/females	**32.9**	**30.5**
Mean bmi/males	**28**	**27.5**

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