ABSTRACT

Background and Aim: Osteoarthritis is now firmly establish as public health problem. It is the most disabling diseases in many countries. Knee osteoarthritis is regarded as the most common form of the disease in adults. Elderly women are more affect by this disorder. From the available evidences, it is now reasonable to consider this disease as one of the most important among the chronic diseases and investigation for the risk factors that are associated with this disorder is very important. Aim of study to assess risk factors of osteoarthritis of the knee joint among women.

Material and method: Case control study, where 200 women with symptomatic knee osteoarthritis proved by physical examinations and radiological evidences were allocate as cases. In addition, 200 women proved to be without clinical or radiological evidence of knee osteoarthritis were allocate as controls. The study was applied from 15th November 2013 to 7th April 2014. Questionnaire which focus on the distribution of the study population according to personal characteristics such as (Family history, smoking, sedentary lifestyle, walk long, employment and urban), life events as (previous trauma, stress previous surgery), other variables such as (BMI, DM, HT, genitourinary, calcium intake).

Results: Smoking appeared in this study to be highly associated with knee osteoarthritis at (p-value =0.007), Sedentary lifestyle associated with development of knee Osteoarthritis (P-value =0.000), Unhealthy calcium intake was highly associated with development of knee osteoarthritis (P-value=0.000), Walking for long distances appeared unexpected negatively associated with occurrence of knee Osteoarthritis (P-value=0.84). Employment appears unexpected negative associated with occurrence of knee Osteoarthritis (p-value= 0.129).

Conclusion: Obese Women, diabetes mellitus, genitourinary infection, stress and previous surgery are the high risk for developing knee osteoarthritis, while hypertensive women or women with previous trauma has low risks for developing knee osteoarthritis.

Recommendation: the study recommended avoiding sitting for long times, apply exercise regularly and encourage calcium intake for women to decrease the incidence of knee osteoarthritis.

Keyword: Risk factor, Knee, Osteoarthritis, Women.

INTRODUCTION

Background: Osteoarthritis: a major contributor to functional impairment is becoming increasingly prevalent worldwide due to its association with an aging population and due to a growing prevalence of obesity (Berenbaum 2008). Knee osteoarthritis is a common cause of pain and disability, The scientific literature on the association between physical workload (e.g., kneeling/squatting, lifting/carrying of loads) introduced knee osteoarthritis into their national lists of occupational diseases (Andre et al, 2010).

While age is strongly associated with the risk of knee osteoarthritis, overweight is arguably the most important modifiable risk factor (Dunlop, et al 2010). Obesity is consistently found to be a risk factor for knee osteoarthritis. Body mass index (BMI) has been associated with the incidence and progression of knee osteoarthritis, independently of age and sex. The mechanisms by which obesity is linked to the pathogenesis of knee osteoarthritis are not completely understood.

Biomechanical factors (e.g., reduced physical activity and immobility abnormal knee adductor moment, high pressure on the articular cartilage) and metabolic mechanisms (e.g., hormonal dysregulation, adipokines) have been suggested as possible mediating factors for this joint disorder (Coggon et al, 2001). Lifestyle factors, such as tobacco smoking, performing sports, and exercising, are inconsistently associated with a higher risk of knee osteoarthritis (Ding C, et al, 2007). The chance of suffering from knee Osteoarthritis increases with advancing age. The prevalence is set to increase further. Conservative management for Osteoarthritis of the knee is often successful and should always be considered initially. However, it is not uncommon for the situation to arise where conservative management has failed or indeed is futile. Categorize and detail the surgical
options available for knee Osteoarthritis. Key results from the literature will be used to demonstrate the current reasoning behind evidence-based practice in surgery for knee Osteoarthritis. In particular, we shall focus on evidence comparing surgical for knee Osteoarthritis. (Lewis et al, 2009).

Osteoarthritis: is chronic disorder of synovial joints in which there is progressive softenning and disintegration of articular cartilage accompanied by new growth of cartilage and bone at the joint margins (osteophytes) cyst formation and sclerosis in the subchondral bone mild synovitis and capsular fibrosis. It differs from simple wear and tear in that it is asymmetrically distribution often associated with abnormal loading rather than frictional wear. (Solomon and et al, 2010)

Rationale of study:-
1- Osteoarthritis is major cause of impaired mobility. 1990, Osteoarthritis was estimated to be the eighth leading non -fatal burden of disease ,accounting for 2.8 % of total years of living with disability ,and the highest ranking disease among the musculoskeletal disease and contributes to approximately 50% of the disease burden in this disease group (Woolf and et al, 2003)
2- The risks of osteoarthritis were increase in Iraq after last war, because of decreasing in exercise and prolonged sitting related to security situation limited.

Aim of the study:- To identify risk factors of osteoarthritis of the knee joint among women

Objectives of the study:-
1- To identify risk factors of osteoarthritis of the knee joint related to personal characteristic of women.
2- To assess risk factors of osteoarthritis of the knee joint related to life event.
3- To assess risk factors of osteoarthritis of the knee joint related to some diseases.

Terms definitions
a. Theoretical definition of osteoarthritis
It common chronic, progressive musculoskeletal disorder characterized by gradual loss of articular cartilage. The disease most commonly affects the middle -aged and elderly, although it may begin earlier as result such as the knee hip and spine.(Blagojevic, et al 2010).

b. Operational definition of osteoarthritis
The patients with osteoarthritis who is living in Mosul city, who visit the hospital and diagnosed with osteoarthritis by orthopedic surgeons and rehabilitation physicians depending on clinical manifestation of the disease and approved by X-ray examination.

MATERIALS AND METHOD

Ethical Issues
Administrative arrangement
Before collection of data, official permission was obtained from the University of Mosul/ Nursing College/ Research committee. (Appendix A)

Consent form to the sample:
Ethical issue was obtain from all clients and only who are agree to participate in the study they chosen. (AppendixB)

Design of the study:
To achieve study objective case-control study design was apply.

Period of the study:
The study was conducted from 15th November 2013 to 7th April 2014.

Setting of the study:
The study was conduct in Jumhory Teaching Hospital, Al-Salaam Teaching Hospital, Al-Khansaa Teaching Hospital, Ibn-sena Teaching Hospital and Al-Batool Teaching Hospital in Mosul city.

Sample and sampling of the study:
This study adopted, 200 female with symptomatic knee osteoarthritis were enroll in this study as cases according the following inclusion criteria:
1. Positive finding for osteoarthritis in the X-ray and examination of the knee joint.
2. Suggestive history of the osteoarthritis.
3. Employment women and live in urban.

Exclusion criteria:
1- Negative finding for osteoarthritis in X-ray and examination of the knee joint.
2- No history of the osteoarthritis.
3- Women was doing house wife and live in rural.

Another 200 female were chosen as control for this study with the following inclusion:
1. Negative of the history to any previous episode for knee joint pain and swelling.
2. Negative X-ray finding for Osteoarthritis
3. Employment women and who live in urban.

Tool of the study:
In order to collect study information, a questionnaire was built by researchers and send to expert for their opinions after that all modification by expert was done. It is composed of three parts:

**Part one:** which focus on the distribution of the study population according to personal characteristics such as (Family history, smoking, sedentary lifestyle, walk long, employment and urban). (Appendix C).

**Part Two:** Is distribution of the study population according to life events as (previous trauma, stress, previous surgery).

**Part Three:** Is distribution of the study population according to other variables such as (BMI, DM, HT, genitourinary, calcium intake).

Yes or No was the options for answering about study questionnaire.

**Validity**
To ensure validity, questionnaire was send to ten experts to evaluate the proposed plan of the study tool, their opinions, suggestions and recommendations were depended to adapt and direct the study tool. (Appendix D).

**Reliability**
Reliability of the study tools was examine by using split half = 0.81 approach of the computation of Cronbach Alpha Correlation coefficients.

**Data analysis:** -special statistical analysis (SPSS 21) was use to examine the effect for results in this study, data were analyze through statistical procedure by used the odd ratio was then calculated for every risk factors of the concern in this study with its P-value frequency and percentage.

**Limitations of the study**
1. Difficulty in collecting information.
2. Time consuming relating to large sample (400) clients a case control.

**RESULTS**

Table (1) Distribution of the study population according to personal characteristics.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Cases</th>
<th>Control</th>
<th>OR</th>
<th>P-value</th>
<th>95% C.I.</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family History</td>
<td>65</td>
<td>32.5</td>
<td>23</td>
<td>11.5</td>
<td>0.538492</td>
<td>0.028687</td>
</tr>
<tr>
<td>Smoking</td>
<td>43</td>
<td>21.5</td>
<td>23</td>
<td>11.5</td>
<td>2.107726</td>
<td>0.007058</td>
</tr>
<tr>
<td>sedentary lifestyle</td>
<td>68</td>
<td>34</td>
<td>17</td>
<td>8.5</td>
<td>0.180328</td>
<td>0.000000</td>
</tr>
<tr>
<td>Walk long</td>
<td>103</td>
<td>51.5</td>
<td>105</td>
<td>52.5</td>
<td>1.040879</td>
<td>0.841355</td>
</tr>
</tbody>
</table>

Table (2) Distribution of the study population according to life events.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Cases</th>
<th>Control</th>
<th>OR</th>
<th>P-value</th>
<th>95% C.I.</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous trauma</td>
<td>47</td>
<td>23.5</td>
<td>41</td>
<td>20.5</td>
<td>1.191296</td>
<td>0.468939</td>
</tr>
<tr>
<td>Stress</td>
<td>83</td>
<td>41.5</td>
<td>52</td>
<td>26</td>
<td>2.019066</td>
<td>0.001046</td>
</tr>
<tr>
<td>Previous surgery</td>
<td>45</td>
<td>22.5</td>
<td>14</td>
<td>7</td>
<td>3.857143</td>
<td>0.000012</td>
</tr>
</tbody>
</table>

Table (3) Distribution of the study population according to social context.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Cases</th>
<th>Control</th>
<th>OR</th>
<th>P-value</th>
<th>95% C.I.</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>176</td>
<td>88</td>
<td>185</td>
<td>92.5</td>
<td>0.594595</td>
<td>0.129266</td>
</tr>
<tr>
<td>Urban</td>
<td>138</td>
<td>69</td>
<td>111</td>
<td>55.5</td>
<td>1.784656</td>
<td>0.005355</td>
</tr>
</tbody>
</table>

Table (4) Distribution of the study population according to other variables.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Cases</th>
<th>Control</th>
<th>OR</th>
<th>P-value</th>
<th>95% C.I.</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI less than 30</td>
<td>178</td>
<td>89</td>
<td>169</td>
<td>84.5</td>
<td>2.484131</td>
<td>0.044099</td>
</tr>
<tr>
<td>D.M</td>
<td>55</td>
<td>27.5</td>
<td>47</td>
<td>23.5</td>
<td>2.809863</td>
<td>0.038764</td>
</tr>
<tr>
<td>H.T</td>
<td>109</td>
<td>54.5</td>
<td>108</td>
<td>54</td>
<td>0.980056</td>
<td>0.920056</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>79</td>
<td>39.5</td>
<td>66</td>
<td>33</td>
<td>2.754393</td>
<td>0.016333</td>
</tr>
<tr>
<td>Calcium intake</td>
<td>156</td>
<td>78</td>
<td>183</td>
<td>91.5</td>
<td>3.036199</td>
<td>0.000173</td>
</tr>
</tbody>
</table>

**DISCUSSION**

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The analysis of the results with regard to distribution of the study population according to personal characteristics indicates that family history significantly associated with knee osteoarthritis at (p-value 0.28).

In this study smoking has significantly associated with knee osteoarthritis at (p-value 0.007). This result dis agreement with Ilias and al (2009) who indicates that heavy tobacco smoking was associated with a decreased knee osteoarthritis risk in comparison with never-smoking (OR 0.2; 95% CI 0.1–0.5). While study with Blagojevich et al (2010) in who indicates that smoking appeared to have a moderate protective effect from knee osteoarthritis.

In this study show, that sitting for long time was sedentary life significantly associated with knee osteoarthritis at (p-value 0.000)

Same situation in French by Kristina et al, (2007) who found that female with sedentary life are about four folds increase risk of knee Osteoarthritis than those with active movement.

No significantly, relationship between walking for long time associated with knee osteoarthritis at (p-value 0.841)

The study conducted that there were no relationship between knee and previous trauma not significantly at (P-value 0.4)

Different study in Germany by Andre et al. (2010) who indicates that genetic predisposition (women, OR 2.17; men, OR 2.37); and sports with a risk of unapparent trauma.

The result of the present study indicates that Stress in respect of distribution of the study population according to life events is significantly associated at (P-value 0.001). Actually stress is very difficult to be assessed, since it is more subjective symptoms and the reaction to it differ considerably in different humans. As (Okma and Hopman, 2001) found in their study that the onset and symptoms of the knee Osteoarthritis will be more Sever if they are associated with stressful life events. Also Gretchen et al, 2005 found that reaction to stress would differ considerably in different population with knee and other forms of Osteoarthritis.

The result of the present study indicates that previous surgery in respect of distribution of the study population is significantly associated at (P-value 0.0000)

A key finding of study found a history of previous knee surgery (essentially arthroscopic surgery) strongly associated with a higher prevalence of NP-like symptoms. Trescot AM, Brown MN, Karl HW (2013).

The result of the present study indicates that Employment has no associated with Osteoarthritis at (P-vale 0.12) no significant relationship among osteoarthritis patients and occupation who was found by Frnklin et al (2010)

The result of the present study indicates that Urban has significantly associated with knee osteoarthritis at (P-value 0.005), Same study by Friedrich M, Cermak T, Heiller I (2000) who revealed that the role of occupation, for Osteoarthritis Trauma, lack of education, and primitive work environment are the other risk factors.

The result of the present study indicates that body mass index significantly associated with Osteoarthritis at (P-value 0.04) similar studies by domains Mark (2007), Losina et al., (2011) who revealed that there is significant relationship among osteoarthritis patient and weight status of these patient

In this study, there were relationship between Diabetes Mellitus and Genitourinary with knee Osteoarthritis at (P-value 0.038), same result in Germany by Miksch et al. (2009) who represent that significant relationship among Osteoarthritis with Diabetes Mellitus and Genitourinary.

The result of the present study found that there no relationship between Osteoarthritis and Hypertension at (p-value 0.92) as study of the Thommansen and Zhangs (2006) who found that hypertension does not increase incidence of Osteoarthritis, while in the result of Zahariea et al (2009) who revealed that 84.8% of Osteoarthritis patient having hypertension

The result of the present study indicates that calcium intake is significantly associated in case group at (P-value 0.000) the study of Jenny H Ledikwe (2003) mentioned that unhealthy dietary behaviors such as high calcium intake appeared in man studies to be associated with many health problems and it is found to be as a main contributor to the development of Osteoarthritis in different types of body.

CONCLUSION

Women with unhealthy calcium intake urbanization, general obesity, diabetes mellitus, genitourinary, stress, smoking, family history,
sedentary life style, previous surgery, rural are of high risk of development of knee osteoarthritis, walk long employment hypertension, previous trauma, and unexpected change in economic, status appeared to be negatively associated with the occurrence of knee osteoarthritis in women post-menopausal.

RECOMMENDATIONS
The study recommended avoiding sitting for long times, apply exercise regularly and encourage calcium intake for menopausal women to decrease the incidence of knee osteoarthritis. Avoids or stop smoking and complications of genitourinary infection, both of them put people at risk of osteoarthritis. Maintain ideal weight according to BMI measurement to avoid over weight and obesity.

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Losina, E.; Walensky, R.; Reichmann, W.; holt, H.; and Katz, J. Impact of Obesity and Knee Osteoarthritis on Morbidity and

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