A STUDY TO ASSESS THE RELATIONSHIP BETWEEN DEPRESSION AND OSTEOARTHRITIS ACCORDING TO THE SEVERITY OF PAIN AND LOSS OF FUNCTION

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Abstract

Background & Objective: As there is increase in the obesity and elderly population worldwide, Osteoarthritis(OA) disease is unfortunately on the rise. When the duration of disease increases, there is a chance that the psychological morbidity evolves into depression .The objective of this study is to assess a relationship between depression and osteoarthritis according to the severity of pain and loss of function.

Methods: This cross-sectional study was conducted at Orthopedic and Rheumatology department of Combined Military Hospital, Lahore from October 2022 to March 2023. All the patients reporting to the outpatient department of either gender aged more than 45 years with a diagnosis of OA based on X-ray findings and a consultant review were included in our study. Severity of OA was studied using the WOMAC (Western Ontario and McMaster Universities) Osteoarthritis Index. Depression was measured using the Personal Health Questionnaire (PHQ-9) scale in these patients simultaneously. (12) It was translated in Urdu for the ease of our participants.

Results: Out of the 196 participants of our study, 71 (36.2%) were males while 125 (63.8%) were females. Mean age of the participants of our study was 55.49 Years $\pm$ 8.98. Mean WOMAC index score was 61.02 $\pm$ 19.11. 3 (1.5%) patients of OA had mild disease in our study and no depression was found in them. In the moderate disease group, 34 (17.3%) had no symptoms of depression, 62 (31.6%) had minimal depression, none had mild, moderate or severe depression while only 1 (0.5%) had moderately severe depression. Out of 96 (48.9%) of the OA patients with severe disease as per the WOMAC index, 3 (1.5%) had minimal depression, 47 (23.9%) had mild depression, 15 (7.6%) had moderate depression, 27 (13.8%) had moderately severe depression and 4 (2.0%) had severe depression.

Conclusion: OA is a debilitating disease. Quality of life of patients is severely affected as the duration increases due to pain, stiffness and loss of function of joints. Long term disease leads to depression of variable degrees. . Thus early diagnosis and timely intervention in such patients with an individualized management plan can improve the outcome and quality of life of patients.

Keywords: Osteoarthritis, Depression, Morbidity

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Osteoarthritis is a progressive degenerative joint disease that is widely prevalent and very debilitating.[1] It is estimated to be affecting more than 240 million people all around the world and over 32 million in the United States only.[2] With the increase in the obese and elderly population worldwide, this disease is unfortunately on the rise.[3] Previously considered a simple disease due to age related wear and tear of weight bearing joints of the human body, osteoarthritis through various studies is now found to be a complex interplay of genetic, inflammatory and immune processes working in the body alongside various risk factors like age, female gender and obesity contributing and overall increasing the degeneration of joints.[4] Just like the rest of the world, Pakistan also has high rates of OA. Just in Northern Pakistan alone, 3.6% rural and 3.1–4.6%

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urban population was diagnosed with OA of knee joint.[5]

While sadness and blues are simple human emotions felt every now and then, depression is a more serious condition in which the affected person feels hopeless, worthless, has low self-esteem and self-confidence. Often there is self-neglect and social with drawl.[6] It is now becoming a well-known fact backed up by various studies that chronic illnesses not only disturb the lifestyle of patients significantly but also cause symptoms of anxiety in them. As the duration of diseases increases, there is a chance that the psychological morbidity evolves into depression.[7] The symptoms of depression in patients with chronic illnesses are often masked due to other co-morbidities but if left untreated it can lead to self-harming behaviors and suicidal ideation, along with worsening symptoms of the underlying chronic illness.

There is a clear association between symptomatic OA and depression as studied in various parts of the world.[8] With patients of OA suffering from depression in the longer run, the overall burden of this disease on healthcare systems also increases drastically.[9] Also, OA with depression is often poorly managed and overlooked.[10] Despite of the possible overwhelming effects of physical and psycho-social morbidity of OA on our population, there has not been much literature found. This aspect of OA has rather been neglected and the data found from our part of the world is scarce. Therefore, we designed this study to find out the relationship between OA and depression on our subset of population.

METHODS

This was a cross sectional study set up in the Orthopedic and Rheumatology department of Combined Military Hospital, Lahore from October 2022 to March 2023. After approval of the Ethical Committee of the Institute, the study commenced. Informed consent was taken from all the participants of the study.

A sample size of 196 was taken according to WHO sample size calculator keeping confidence interval as 95% and error of margin 6%. Sampling technique was non-probability convenient sampling. All the patients reporting to the outpatient department of either gender aged more than 45 years with a diagnosis of OA based on X-ray findings and a consultant review were included in our study. Demographics of the patients were recorded separately. Severity of OA was studied using the WOMAC (Western Ontario and McMaster Universities) Osteoarthritis Index.[11] This questionnaire measures the severity of OA based on pain, stiffness and difficulty in various physical functions and scores them according to the debility faced by the patients. The scores range between 0 to 96 where 0 is the best possible health status and 96 being the worst health condition possible. Depression was measured using the Personal Health Questionnaire (PHQ-9) scale in these patients simultaneously.[12] It was translated in Urdu for the ease of our participants. PHQ-9 scored the participants from 0-27 and table 01 shows the interpretation of the scores allotted. The exclusion criteria was the diagnosis of depression prior to onset of OA which increases patient susceptibility to depression.

Data confidentiality was maintained. After data collection, it was analyzed on SPSS-22 and Microsoft Excel. Descriptive stats were applied to measure mean $\pm$/- standard deviation, (SD) frequency and percentages. One way ANOVA test was applied by considering P value < 0.05.

RESULTS

Table 1: *Interpretation of PHQ-9 Score to assess depression severity in participants of the study.*

Total Score	Depression Severity
1-4	Minimal Depression
5-9	Mild Depression
10-14	Moderate Depression
15-19	Moderately Severe Depression
20-27	Severe Depression

Out of the 196 participants of our study, 71 (36.2%) were males while 125 (63.8%) were females. Mean age of the participants of our study was 55.49 Years $\pm$ 8.98. 138 (70.4%) of the patients of OA had chronic illnesses while 58 (29.6%) had no chronic illness.

Minimum WOMAC score recorded in our study was 29 while the maximum score was 92. Mean

WOMAC index score was 61.02 ± 19.11. Mean pain score out of a possible 20 was 12.69 ± 4.79. Mean score for stiffness was 5.12 ± 1.27 out of 8 while that for loss of function was 43.29 ± 15.00 out of 68. Figure 1 shows the percentages of severity of depression of the participants as calculated by the Patient Health Questionnaire (PHQ-9)

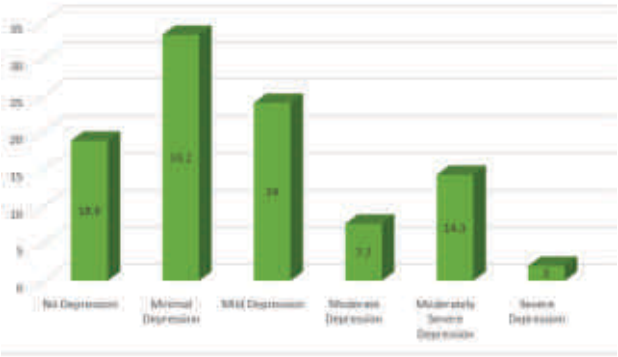

Figure # 1: *Severity of Depression in Patients of OA*

Our study found out that greater the duration of illness, more would be the severity of depression. Table 02 highlights this very finding.

As far as the relation of depression with severity of OA is concerned, we divided the WOMAC scoring index into 3 categories i.e. from 0-30 as mild OA, 31-60 as moderate OA, 61-98 as severe OA. Only, 3 (1.5%) patients of OA had mild disease in our study and concomitantly, no depression was found in them. In the moderate disease group, 34 (17.3%) had no symptoms of depression, 62 (31.6%) had minimal depression, none had mild, moderate or severe depression while only 1 (0.5%) had moderately severe depression. Out of 96(48.9%) of the OA patients that had severe disease as per the WOMAC index, 3(1.5%) had minimal depression, 47 (23.9%) had mild depression, 15(7.6%) had moderate depression, 27(13.8%) had moderately severe depression and 4(2.0%) had severe depression. Unfortunately, all the patients having severe OA were depressed to some degree. The relation between degree of OA as per the WOMAC scoring index and severity of depression using the one way ANOVA test was found to be statistically significant, p- value = 0.012 (<0.05) which in turn reinforces the findings of our study. Another interesting finding of our study was that all the 4 (2.0%) that were severely depressed were females (p=0.000140) so it seems that gender in patients of OA is somewhat related to the severity of depression that patients might develop during the course of their disease.

Table 2: *Relationship of Degree of Depression with Duration of Osteoarthritis*

Severity of Depression	1-5 years	6-10 years	>10 years
No Depression	37	0	0
Minimal Depression	62	2	1
Mild Depression	9	19	19
Moderate Depression	0	4	11
Moderately Severe Depression	4	0	24
Severe Depression	0	2	2

DISCUSSION:

Just like in any chronic illness, the longer the duration of disease the more chances are that the patient develops its associated complications. Depression with OA is common and often overlooked. As the disease gets severe, the quality of life gets poorer and depression might get severe.[13] Our study reinforces this very thing, because we found out that considerable patients with disease duration more than 10 years had depression of some degree.

Table 3: *Degree of Depression in various severity of diseases (n= 196)*

Severity of Depression (PHQ 9)	Mild OA (0-30 WOMAC Score)	Moderate OA (31-60 WOMAC Score)	Severe OA(61-98 WOMAC Score)
No Depression	3 (1.53%)	34(17.35%)	0
Minimal	0	62(31.63%)	3 (1.53%)
Mild	0	0	47(23.98%)
Moderate	0	0	15 (7.65%)
Moderately Severe	0	1 (0.51%)	27(13.78%)
Severe	0	0	4 (2.04%)
Total (n=196)	3 (1.53%)	97(49.49%)	96(48.98%)

A meta-analysis comprising of a review of 49 studies carried out in University of Aberdeen, London UK states that although one fifth of the patients with OA have symptoms of depression and anxiety, it is unclear if OA directly contributes to its development or not.[18] This highlights a particular grey area in litera-

ture, where presence of multiple comorbidities of different severity can serve as contributing factors to development of depression in the geriatric population.

There was a significant relationship between severity of OA and degree of depression (p= 0.012) in our study and this is in line with the existing literature.[14] Having established that our subset of population with OA having severe disease especially, are depressed to some degree, there is a need to come up with measures that involve timely intervention. This is especially relevant to the clinical practice and awareness of the physicians regarding depression in patients of OA. If intervened in time, morbidity of such patients can be reduced drastically.[15,16] This also requires more of a multidisciplinary approach for ensuring continuity of care. A study carried out in Toronto, Canada concluded that OA has a definitive association with depression and the physicians must be aware of the comorbidities of their patients and formulate an individualized management plan to address patient's needs.[17]

As far as the economic burden of the disease goes, 7% of the population globally, which is about 528 Million people suffer from OA.[19] OA is a disabling disease. If we take the prevalence into account, the magnitude of morbidity can be calculated. This is alarming. If increasing number of the patients with OA become anxious or depressed, their quality of life gets worse. Seeing the bigger picture, a timely diagnosis and intervention in early depressive symptoms can make a big difference.

CONCLUSION

In conclusion, OA is a debilitating disease. Quality of life of patients is severely affected as the duration increases due to pain, stiffness and loss of function of joints. Long term disease leads to depression of variable degrees. This adds to the overall morbidity. Thus early diagnosis and timely intervention in such patients with an individualized management plan can improve the outcome and quality of life of patients.

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