The Association of Disease Duration & Patient Activity Loss with Incident Depressive Symptoms in Adult Orthopedic Trauma Patients.

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ABSTRACT

Objective: The objective of this study was to find the association of disease duration & patient activity loss with the incident depressive symptoms in adult orthopedic trauma patients in population of DIKhan division, Pakistan.

Methods: This observational study was conducted in the department of Orthopedics Gomal Medical College DIKhan from January 01, 2020 to December 31, 2021. Patients were free of depression symptoms at the baseline & were assessed prospectively over a period of 2 years, first at 12 months of orthopedics trauma & then at 2 years for depression symptoms. Patients for depressive symptoms were assessed by Public Health Questionnaire (PHQ)-2 & PHQ-9 screening. The intensity of physical activity was assessed using METs (metabolic equivalent of task) scale. Pearson's Chi-square test was used to find the association of dependent variable i.e. depression with independent variables i.e. Disease duration & Patient's activity loss. The study's end point was new-onset depression symptoms.

Results: Total 630 patients were included in our study, in whom depression was found in 51 (8.0%), male 34(5.39%) and female 17(2.61%). The mean age was 42.37+/- 5.4. Among 51 patients, 38(6.03%) had duration of illness more than one year and 29(4.6%) patients with loss of activity & the results were statistically significant (p-value<0.05).

Conclusion: This prospective observational study demonstrates that the patients presenting to orthopedics trauma should be screened for depressive symptoms & necessary referrals to behavioral health & psychiatric units should be made.

Keywords: Depression; Physical activity; Orthopedics; Trauma; Wounds; Psychiatry.

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INTRODUCTION

Depression is characterized by loss of interest in activities and the presence of mood disturbances that are once enjoyed by someone. It is a common but a serious medical condition that affects the body, mood & thoughts.[1-2] According to WHO by 2030, unipolar depressive disorders will become the leading cause of global burden.[3] In the recent years it has been found that psychological factors affect recovery status from musculoskeletal trauma.[4-5] Orthopedic trauma can have a significant psychological, physical, social impact on patients health.[6] The prevalence of Depression was found 32.6% in twenty seven studies on Orthopedic trauma patients.[7] Many studies have found the negative impact on the outcomes after orthopedic injury e.g. depression is associated with increased pain & can cause delay in return to work.[8-9]

In one study, 250 Orthopedic surgeons found that 90% of their trauma patients had some psychological symptoms & among these surgeons only 60% referred their patients for proper psychological treatment.[10] Weinberg et al. [11]2013 from Cleveland, Ohio, USA for the period of 3 years

found that the prevalence of depression in orthopedic trauma patients was 22.3% (74)(74*100/332=22.3). Secrist et al.[12]2022 from Charlotte, North Carolina in a Case Series found that 10.5% (60) (60*100/573) patients in musculoskeletal trauma suffered from moderate depression (PHQ-9 Score ≥10). Kim et al.[13]2015 from republic of Korea in a cohort study of 119,069 cohorts, found that as compared to the sedentary group (0–600 METs-min/week), a significantly lower risk of incident depressive symptoms was found in males who performed 1800–3000 METs-min/week and female who performed 1200–1800 METs-min/week. Muscatelli et al.[14] in a Meta-Analysis from Hamilton, Canada in 2018 found that 32% males & 42% females in orthopedic trauma suffer from depression.

The objective of this study was to find the association of disease duration & patient activity loss with the incident depressive symptoms in adult orthopedic trauma patients in population of DIKhan division, Pakistan. The significance of this study for orthopaedic surgeons would be determination of prevalence of depression in trauma patients and association with chronicity of disease and loss of physical activity.

METHODS

This observational study was conducted in the department of Orthopedics DHQ Teaching Hospital, DIKhan, Pakistan from January 01, 2020 to December 31, 2021. The data for this study was assembled from patients coming to opd during follow up or admitted patients in Orthopedic Unit DHQ Teaching Hospital, DIKhan. Approval for this research was taken from Hospital ethical committee while informed consent was taken from patients or attendants. The study included 630 patients who sustained an orthopedic injury after acute trauma and were between the ages of 16–65 & having more than two months of musculoskeletal disease. The exclusion criteria were patients with head injury or massive polytrauma, known patients with psychiatric illness or taking anti-psychiatric medications, low IQ/ Mentally retarded patients & patients not willing to participate in this study. Patients having METs score[15] less than 600 METs-min/week were included in Sedentary i.e. Loss of physical activity group while patients with METs score more than 600 METs-min/week were classified as physically active group. All patients were free of depressive symptoms at baseline when included in our study. Patient's physical activity was measured using METs (Metabolic equivalent of Task) scale, which measures the intensity of physical activity. Depression was measured using Patient Health Questionnaire 2 & 9 (PHQ-2 & PHQ-9), which was developed in 2001 to diagnose the presence & severity of depression.

Patients were assessed initially for depression by PHQ-2 by resident surgeon & a trained nurse. A score of ≥3 was considered a positive result & patient was further assessed for depression by PHQ-9. PHQ-9[16] is a 9-item Questionnaire used to screen for depression. Patients indicate depression frequency in the past 2 weeks on a four points scale, ranging from zero (never) to 3 (nearly every day) for a total score ranging from zero to 27. Patients having PHQ-9 score >9 were considered as depression patients & were referred to psychiatry department for proper management. All patients were assessed prospectively over a period of 2 years, first at 12 months of orthopedics trauma & then at 2 years for depression symptoms.

Gender (men/women) & age groups (≤40 years & ≥40 years) were our matching variables while the presence of depression & its association with patient's activity loss & disease duration (<1 year or >1 year) were our research variables. The data for the sample were described by counts & percentages and for the population as confidence interval with 95% confidence level. The Pearson's chi-square test was used to evaluate the association of dependent variable i.e. depression with independent variables i.e. patient's activity loss & disease duration. Observed, expected counts & chi-square values were used to check for the association of variables.

RESULTS

Sample Description: Total 630 patients were included in our study, in whom depression was found in 5 (8.0%) patients with 34 (5.39%) men and 17 (2.61%) women. The mean age was 42.37 & depression was found in 30 (59%) patients in age group <40 years as compared 21 (41%) patients in >40years age group.

Among 51 patients, 75% (38) patients had duration of illness more than 1 year, while 25% (13) patients had duration of illness less than 1 year and 57% (29) patients had loss of activity i.e. Sedentary group as compared to 43% (22) patients with no loss of activity.

Hypotheses Testing:

H_{01}: H_{01} was rejected showing that there is statistically significant (p-value<0.05) association between patient's activity loss & incidence of depression. (Table)

Table 1: Pearson's Chi-square test of independence to compare association between patient's activity loss & incidence of depression.

Variables			LOSS OF ACTIVITY		Chi-square value	d.f	p-value
			Yes	No			
Depression	Yes	Count	47	14	226.934 543	1	<0.00
		Expected count	8.4	52.6			
	No	Count	40	529			
		Expected count	78.6	490.4			
Total		Count	87	543			
		Expected count	87.0	543.0	H_{01} rejected at alpha 0.05		

H_{02}: H_{02} was also rejected showing statistically significant association (p-value<0.00) between duration of illness & patient's activity loss with 75% (38) depression at >1 year period of orthopedic trauma. (Table: 2)

Table 3.2.2 Pearson's Chi-square test of independence to compare association between disease duration & incidence of depression.

Variables			DURATION OF DISEASE		Chi-square value	d.f	p-value
			Less than 1 year	More than 1 year			
Depression	Yes	Count	19	42	174.601	1	<0.00
		Expected count	52.7	8.3			
	No	Count	525	44			
		Expected count	491.3	77.7			
Total		Count	544	86			
		Expected count	544.0	86.0	H_{02} rejected at alpha 0.05		

DISCUSSION

Psychiatric disorders are one of the foremost cause of disability among nonfatal illness and also the leading cause of global health burden.[17] There is an association of emotional distress with physical injury & disability, that can affect the patient outcomes, physical activity & productivity.[18-20] There is high data regarding the increased incidence of depression and anxiety in orthopedic trauma patients & their effects on the postoperative outcomes.[21-23] Therefore patient's outcome after orthopedic surgery doesn't depend mainly on the successful surgical procedure but also on the mental status of the patient as well.[24] High rates of depression are found in patients sustain severe lower extremity injuries.[25] So it is natural to expect increased depression rates in patients with severe trauma due to different reasons. Crichlow et al.[26] had different findings in his survey and found no correlation between injury or fracture severity with depression. However, it was found that patients with compound fracture have 4.58 times increased chances of moderate to severe depression than in simple fracture patients.

Many studies in the literature showed increased incidence of depression in orthopedics trauma patients but none of them revealed the association of depression with duration of illness. So, in our study we have found the association of depression with duration of orthopedic trauma & activity status of the patient. American heart association (AHA) highly recommends minimum 150 minutes of moderate intensity aerobic activity in a week or 75 minutes per week of vigorous aerobic activity for optimal cardiovascular health, which is approximately equal to 500 Mets-min/week. Analysis of depression in patients with temporary disability is a difficult task. So, patient's health questionnaire (PHQ-2 & PHQ-9) was used as a screening tool for depression.

In our study it was found that among 51 patients, 75% (38) patients had duration of illness more than 1 year, while 25% (13) patients had duration of illness less than 1 year and 57% (29) patients had loss of activity i.e. sedentary group as compared to 43% (22) patients with no loss of activity. No study from literature was retrieved regarding duration of illness from orthopedic trauma & incidence of depression. However, many study revealed increased incidence of depression in orthopedic trauma patients.

Muscatelli et al.[14]2018 in a Meta-Analysis from Hamilton, Canada found that 32% males & 42% females in orthopedic trauma suffer from depression. Secrist et al.[12]2022 from Charlotte, North Carolina in a Case Series observed that 10.5% patients in musculoskeletal trauma suffered from moderate depression (PHQ-9 Score ≥10). Weinberg et al. [11]2013 from Cleveland, Ohio, USA for the time period of 3 years observed that the prevalence of depression in orthopedic trauma patients was 22.3%. similar to our study Kim et al.[13] from republic of Korea found increased incidence of depression in sedentary group (0–600 METs-min/week) as compared to ones with increased physical activity (>600 METs-min/week). No study from the research was retrieved with different results.

CONCLUSION

This prospective observational study demonstrates that the patients presenting to orthopedics trauma should be screened for depressive symptoms & necessary referrals to behavioral health & psychiatric units should be made.

Conflict of Interest: None

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