

Professional Reintegration after Pelvic and Acetabular Trauma

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ABSTRACT

Introduction: Pelvic ring and acetabulum injuries are complex injuries varying in severity and complications resulting in serious morbidity in surviving individuals which as a result can be a major contributor to reintegration of patients in professional services. Therefore its important to evaluate to what extent affected patients can return to pre injury work status and how their quality of life is affected. The objective of this study is to evaluate reintegration of affected patients in profession in a two year follow up after acetabular and pelvic ring injuries

Material and Methods: Using local Trauma Registry of Orthopedic Trauma department in Shaheed Mohtarma Benazir Bhutto Institute of Trauma (SMBBIT) a retrospective Cohort study was conducted. All patients between age 18 to 60 who had a Acetabulum or Pelvic Ring fracture presented in SMBBIT during July 2017 to July 2019 and were treated by Orthopedic Trauma department were included in study. Multivariate logistic regression analysis was used to model reintegration to profession. Affected patients were classified as "Reintegrated to profession" if they have earned a month salary after 13 to 24 months rehabilitation post treatment. For unemployed patients along with majority of women who were domestic home makers, reciprocate basic household chores to pre injury injury level were classified as " Reintegrated " Fracture classification, Age, Gender, Fracture of Spine , Nerve Injuries of Lumbo Sacral Spine and/or lower limb and work status before injury were considered prognostic covarities.

Results: Almost 70 percent of 180 researched patients were classified reintegrated. This means a reduction of 20 percent in employment for Pelvic ring injuries and 10 percent reduction in employment for acetabular fractures post treatment. Employment status before injury was the main predictor for reintegration. Older patients had a less chance to return to work in comparison to young individuals. Patients with Nerve injuries and fracture of spine had almost 80 percent higher risk for not being reintegrated.

Conclusion: Acetabular fractures and Pelvic ring injuries currently lead to greater loss of reintegration to profession or domestic work. Trauma to Pelvis and Acetabulum threatens the social security of patients. Therefor rehabilitation and follow up care should be optimized to reduce post traumatic disability and reduce the economic burden of work disability.

INTRODUCTION

Acetabulum and Pelvic Ring injuries usually occur as a high energy trauma usually as part of Road Traffic Accident (RTA) or Fall From Height (FFH). [1] People in their 2nd and 3rd decade of life are affected more. [2] In Karachi Pakistan there had been an increase in RTA as indicated by Local Trauma Registry of SMBBIT during the period of 2016 to 2021. Approximately 10 percent of these trauma cases involve Pelvic Ring and Acetabular Injuries. In these trauma cases minor Pelvic Ring injuries that is not affecting the stability of bony pelvis predominate. Unstable Pelvic Ring Injuries are usually part of Polytrauma resulting in high mortality rate of 21 percent as per SMBBIT trauma registry. Rapid stabilization of Pelvic Ring is the primary goal in treating unstable pelvic fractures in order to reduce Pelvic bleeding and subsequently save life. [1,2,3]The definitive reconstruction takes place in secondary surgical phase of treatment. [3] Multiple innovations in acute trauma phase of Pelvis Injuries had been recently incorporated in order to improve survival in these patients, however the affected surviving patients follow an extensive treatment and rehab protocols before being reintegrated to profession or pre injury social work status.[9,10,11] The dispute in science over the targeted controlling and optimizing reintegration is still underway at this stage. Important rehabilitation milestones include improving one's quality of life and returning to work. Professional reintegration is a significant goal. [14,15]This pertains to both the prolongation of employment as well as the decrease of days lost due to illness or early retirement. Not enough outcome studies had been published to emphasize professional reintegration of patients. International data shows numerous obstacles resulting in functional, morphological, psychological, social and environmental factors most of which are not comparable to a developing nation like Pakistan. The most important obstacle in evaluating reintegration to professional services is long follow up required , we tried to reduce it by ample documentation of contact information and by keeping a keen follow up by surgical team if not by the patient.

MATERIAL AND METHODS

Using local Trauma Registry of Orthopedic Trauma department in Shaheed Mohtarma Benazir Bhutto Institute of Trauma (SMBBIT) a retrospective Cohort study was conducted. All patients between age 18 to 60 who had an Acetabulum or Pelvic Ring fracture presented in SMBBIT during July 2017 to July 2019 and were treated by Orthopedic Trauma department were included in study. Multivariate logistic regression analysis was used to model reintegration to profession. Hospital based ICD coding was used to stratify patients with Pelvic and Acetabular fractures. The included ICD coding is listed in Table 1. The study population was based on the coded main discharge diagnosis on ICD coding.

Table 1: Included ICD Coding

ICD Code	Diagnosis
ICD- 51	Fracture of sacrum
ICD-51.1	Fracture of Coccyx
ICD-52	Fracture of ilium
ICD-53	Fracture of acetabulum
ICD-54	Fracture of pubic bone
ICD-55	Fracture: pelvis, part unspecified
ICD-56	Fracture of Ischium
ICD-57	Fracture: other and multiple parts of pelvis
ICD-58	Traumatic rupture of the pubic symphysis

The main target variable was Reintegration to Profession 1 year post treatment and discharge from hospital. Affected patients were classified as "Reintegrated to profession" if they have earned a month salary after 13 to 24 months rehabilitation post treatment. For unemployed patients along with majority of women who were domestic home makers, reciprocate basic household chores to pre injury level were classified as " Reintegrated " Fracture classification, Age, Gender, Fracture of Spine , Nerve Injuries of Lumbo Sacral Spine and/or lower limb and work status before injury were considered prognostic covarities. Pediatric population and Mortalities resulting from Pelvic Injury during hospital stay were excluded from study. Mortalities in the 13 to 24 month follow

up period were excluded from study. Reintegration to profession or pre injury functional abilities were evaluated via questionnaire either on follow up visit in outpatient department or via phone call to affected patient on the provided contact information at time of

Initial documentation of demographics in Hospital based health system software.

All analysis was done using SPSS 19 software.

Table 2: Age, Gender, Diagnosis as per ICD Coding, Fracture in Spine (FS), Nerve Injury in LumboSacral region and/or Lower limbs (NI) During Initial treatment.

ICD Coding	Frequency	Age (SD)	Gender Male/Female	Fracture Spine (FS) Yes/ No	Nerve Injury (NI) Yes/No
Pelvic Fractures					
ICD 51	12	45 (9)	8/4	1/9	0/12
ICD 51.1	7	41 (10)	5/2	1/6	0/7
ICD 52	9	47 (8)	8/1	1/8	1/8
ICD 54	3	40 (9)	2/1	0/3	0/3
ICD 55	12	43(7)	6/6	0/12	1/11
ICD 56	12	41 (11)	9/1	2/10	1/11
ICD 57	40	48 (10)	25/15	8/32	1/30
ICD 58	5	40 (7)	3/2	1/4	0/5
Acetabular Fractures					
ICD 53	82	42 (11)	60/22	6/76	6/76
Total	180	40 (13)	126/54	20/160	10/170

RESULTS

During the research period between July 2017 to July 2019 a total of 270 patients were identified as per the ICD coding on discharge who were labelled to have either Pelvic Ring or Acetabular fracture. Among those 270 patients only 180 were included in the study as per the inclusion criteria. The average age after the collection of data was 40 years +/- 13 Standard Deviation (SD). Out of 180 patients 126 (70 percent) were male and 54 (30 percent) were female. Among 180 patients 20 patients had a concurrent spinal fracture and 10 patients had an associated LumboSacral and/or lower limb nerve Injury (NI). Patients with spinal fracture and nerve injury were all female. All the 30 patients with spinal fracture and nerve injury were not able to reintegrate back to profession after a period of 24 months post hospital definitive treatment that makes up to almost 17 percent of the total patients lost to reintegration. Only 4 female patients in the whole study group had a professional job prior to injury, rest of the female group was evaluated based on the ability to perform household chores to the pre injury level. Total of 126 patients (70 percent) out of 180 patients were classified reintegrated to profession of which 122 (81 percent) patients were male and 24 (19 percent) patients were female. A total of 54 (30 percent) patients were not reintegrated to profession among which Pelvic ring fractures were 36 patient (20 percent) and acetabular fractures were 18 (10 percent). The regression model suggested that pre employment status prior to injury along with Spinal fractures and nerve injury were significant predictors of reintegration to work with a 95 percent confidence interval. Young patients from 18 to 30 years were more likely to reintegrate back to work than old patients 40 to 60 years. Patients who had Spinal fractures and Nerve Injuries in addition to Pelvic Ring and Acetabular fracture had a 100 percent reduced chance of professional reintegration compared to patients without Spine Injury and/or Nerve Injuries.

DISCUSSION

After sustaining a major trauma to body as in Pelvic Ring and Acetabular fractures restoring body functions is important, along with this the ability of an individual to return back to earning status is essential. [10] The goal of professional reintegration is not only important for financial stability of the individual but also for a better re incorporation in social life along with psychological well being of the affected patient. [11] The Pelvic and Acetabular fractures are singled out because these are the most severely disabling injuries as a result of trauma and usually affecting a young population which is in career building and advancing phases. [12]

Currently there are no local population based studies present to compare the rate of reintegration to profession after a major Pelvic and Acetabular trauma. Internationally a few studies are present showing professional reintegration percentages

ranging from 60 to 75 percent.[3] These study and their data is not comparable to a developing nation like Pakistan due to multiple confounding variables involved in the treatment and rehabilitation protocols. More over labour laws and financial support provided either by Government or insurance also varies. Lastly there are multiple local social and economical factors at play differentiating the reintegration of our population back to work in comparison to western population.

In our study pre employment status before the Pelvic and Acetabulum fracture was identified being the most important predictor for reintegration to profession. The second most important predictor in our study is age, with younger patients being more likely to return to work. Spinal fractures and nerve injuries were identified as a major risk for not being able to work again, this is simply because patients with these injuries along with Pelvic and acetabular injuries , take more time to ambulate and achieve acceptable mobilization status. This is because the physiological inability to walk due to lower limb muscle weakness as in nerve injuries and inability to bear weight as in spinal fractures. One of the reasons for failure of reintegration may be a high job specific requirement as in a laborer or a weakened performance of patient post trauma. This assumption can be justified on the basis that almost 50 percent of the patients who went back to work changed their jobs as identified on data collection based on questionnaire. Gender played a major role in evaluating re integration , but its not plausible as more than 90 percent of females included in the study pool were un employed before trauma and their reintegration was judged solely on the basis of ability to perform the same level of house hold chores as pre injury. This also illustrates that majority of women in the study pool are not part of the economic work force which in turn depicts the social inequality faced by females in terms of employment.

The reintegration rate after a major traumatic injury can also be influenced by another associated clinically relevant secondary diagnosis as revealed by Cancelliere et al [6] Our study is also influenced as such, which indicates that it can have an effect in future comparative studies and results of reintegration may vary. Although nature of fracture is statistically not detectable, patients with Pelvic Ring Injuries had a higher chance at reduced integration to work as compared to acetabular fractures which is in contrast to the findings published by Weber et al which stated that isolated Acetabular fracture patients have a decreased reintegration rate. As per Weber et al the decreased reintegration is due to post traumatic Coxarthrosis which is more common in patients with acetabular fractures. Giannoudis et al. 2009 [16] were able in their study find that specifically in patients with isolated acetabular fracture the outcome in terms of activity and participation, e.g. depends on the degree of destruction of the femoral head. [9] For pelvic fractures without acetabular

involvement, the risk is one Damage to the femur rather minor. Why pelvic and acetabular fractures with regard to the reintegration rate not distinguish in this study, cannot conclusively be clarified.

Our Study concludes that a majority of patients were reintegrated to profession and were able to go back to financial independence post pelvic and acetabular injury, however a significant 30 percent of the patients were unable to regain employment which adds to the social, psychological and economical burden of the trauma. The realization of the fact that spinal fractures and nerve injuries played a major role in reducing reintegration leads to emphasis on more aggressive and extensive rehabilitation for these patients and timely recognition of these injuries for definitive treatment utilizing all available resources to hope for a better clinical outcome in these patients.

Strengths And Limitations Of the Study: The strength of the study is high number of cases from a Level 1 trauma center extracted from hospital trauma registry covering 2 years. Findings in the study of predictors for reintegration to work are from sufficiently high number of cases. The limitation of the study lie in the lack of secondary data and a single population pool. The partial information as per the ICD coding allows on limited conclusion on the extent of clinical symptoms and classification of fractures. Another limitation is the definition of employment which was carefully chosen to assess employment in the follow up period.

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