

A Study of the Impact of Psychiatric Illness and/or Intoxication on Orthopaedic Morbidity in St. James's Hospital Dublin, July 2011

Dublin St. James Hastanesi'nde, Temmuz 2011'de Ortopedik Morbidite ve Maliyet Üzerine Psikiyatrik Hastalık veya Zehirlenmenin Etkisi Hakkında Bir Çalışma

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Abstract

Objective: To assess the impact of psychiatric illness and/or intoxication on injury severity and the duration and complexity of hospital stay in orthopaedic patients.

Material and Methods: All orthopaedic admissions for July 2011 to the Emergency Department at St. James's Hospital were reviewed. Patients were categorised into four groups. Group 1 (n=65): control group. No psychiatric illness, sober on admission. Group 2 (n=15): patients with psychiatric co-morbidity. Group 3 (n=8): patients whose psychiatric co-morbidity directly caused injury. Group 4 (n=15): patients whose intoxication (alcohol and/or drug) caused the injury which was the reason for admission.

Results: Comparison of Groups 1 and 2 revealed the following: Group 2 had x3 greater mean duration of stay (5.95, 20.1); x2 the mean number of theatre procedures (0.64, 1.27); > x2 the mean number of investigations (e.g. x-ray, CT and MRI) (1.0, 2.36). These results were overshadowed by comparison of Groups 1 and 3. Group 3 had x6 higher mean duration of hospital stay (5.95, 34.88); x3 the number of theatre procedures (0.64, 2.13); x3.5 the mean number of investigations (1.0, 3.5). Intoxication (Group 4) caused x3 increase in hospital stay (5.95, 17.43); 25% increase in average number of investigations (1.0, 1.23); x3 increase in non-psychiatric consultations (0.214, 0.875). Mean injury severity scores were highest in Group 3 (7.88); then Group 2 (6.87) and then Group 1 (5.34), revealing worse injuries associated with psychiatric illness.

Conclusion: Psychiatric illness and substance abuse were associated with substantially greater orthopaedic morbidity and duration and complexity of hospital stay. (JAEM 2013; 12: 57-60)

Key words: Orthopaedic injury, psychiatric illness, intoxication, injury severity

Özet

Amaç: Ortopedik hastalarda yaralanmanın ciddiyeti, hastanede kalış süresi ve karmaşıklığı üzerine psikiyatrik hastalık ve/veya zehirlenmenin etkisini değerlendirmek.

Gereç ve Yöntemler: Temmuz 2011 için, St. James Hastanesi acil servisinden tüm ortopedik kabuller gözden geçirildi. Hastalar 4 gruba ayrıldı. Grup 1 (n=65): Kontrol grubu. Psikiyatrik hastalığı yok, başvuruda ayık. Grup 2 (n=15): Psikiyatrik komorbiditesi olan hastalar. Grup 3 (n=8): Psikiyatrik komorbiditesinin doğrudan yaralanmaya neden olduğu hastalar. Grup 4 (n=15): Zehirlenmenin (alkol ve/veya ilaç) başvuru nedeni olan yaralanmaya yol açtığı hastalar.

Bulgular: Grup 1 ve 2 kıyaslaması şunu ortaya çıkardı: Grup 2, x3 daha fazla ortalama kalış süresine (5,95, 20,1); x2 ortalama cerrahi prosedür sayısına (0,64, 1,27); > x2 ortalama inceleme sayısına (ör. x-ray, BT ve MRG) (1,0, 2,36) sahipti. Bu sonuçlar, Grup 1 ve 3 kıyaslamasının gölgesinde kaldı. Grup 3, x6 daha fazla ortalama hastanede kalış süresine (5,95, 34,88); x3 cerrahi prosedür sayısına (0,64, 2,13); x3,5 ortalama inceleme sayısına (1,0, 3,5) sahipti. Zehirlenme (Grup 4) hastanede kalışta x3 artışa (5,95, 17,43); ortalama inceleme sayısında %25 artışa (1,0, 1,23); psikiyatri dışı konsültasyonlarda x3 artışa (0,214, 0,875) neden oldu. Ortalama Yaralanma Ciddiyet Puanları Grup 3'te en yüksekti (7,88); sonra Grup 2 (6,87) ve daha sonra Grup 1 (5,34) vardı ki kötüleşen yaralanmaların psikiyatrik hastalık ile ilişkili olduğunu ortaya koydu.

Sonuç: Psikiyatrik hastalık ve madde kötüye kullanımı önemli ölçüde yüksek ortopedik morbidite, hastanede kalış süresi ve karmaşıklığı ile ilişkili idi. (JAEM 2013; 12: 57-60)

Anahtar kelimeler: Ortopedik yaralanma, psikiyatrik hastalık, zehirlenme, yaralanma ciddiyeti

Introduction

It is widely acknowledged that co-morbid psychiatric illness can adversely affect outcomes in many clinical settings (1). In the case of orthopaedic patients, this is very obvious.

Studies by Stanford et al. (2) and Anderson et al. (3) investigated vertebral fractures and spinal cord injuries following deliberate self-harm and attempted suicide. They showed a significant rise in acute spinal cord injury following attempted suicide and a significantly longer duration of stay from certain spinal injuries when precipitated by

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Table 1. Shows the groups into which patients were categorised based on the presence of psychiatric co-morbidity, psychiatric illness or intoxication at presentation. The numbers in each group are also shown

Group 1	(n=65)	Control group - Patients with no psychiatric co-morbidities (and not intoxicated on admission)
Group 2	(n=15)	Patients with psychiatric co-morbidity
Group 3	(n=8)	Patients in which their psychiatric co-morbidity directly caused injury
Group 4	(n=15)	Patients in which intoxication (alcohol and/or drug) led to the injury which was the reason for admission

deliberate self-harm. Fann et al. (4) demonstrated that patients with any indicator of psychiatric illness had an increased risk of traumatic brain injury (TBI) (relative risk 1.6) compared with those who had no indicator of psychiatric illness. Additionally, the presence or absence of alcohol or drug related conditions did not modify the associations between the other psychiatric conditions and subsequent risk for TBI.

Holmes et al. (5) showed that patients with co-morbid depression or dementia remained significantly longer in hospital following hip fracture than those without. Additionally, they showed that patients with dementia had a higher six-month mortality rate. Following on from this study, Nightingale (6) used a larger patient cohort and showed significantly higher two-year mortality in hip fracture patients if they had co-morbid dementia, depression or delirium.

The medication used to treat psychiatric illness can also be a causative factor of orthopaedic injury. Howard et al. (7) showed an association between prolactin-raising antipsychotic medication and hip fracture. This was presumed to be owed to the reducing effect of the medication on bone mineral density.

These studies reveal worsening morbidity and mortality for orthopaedic patients with co-morbid psychiatric illness. Despite the content of these studies, there is little evidence linking a greater injury severity with active or co-morbid psychiatric illness. Also, complexity and expense of hospital stays have not been fully addressed. Thus, we intend to investigate the impact of psychiatric illness on orthopaedic injury and complexity of hospital stay.

The catchment area of St James's Hospital (SJH) encompasses a high number of the homeless population of Dublin (8). Homelessness is associated with a high rate of mental health problems both as a contributory factor and as a consequence of the homeless state (9).

Material and Methods

Aim: To assess the impact of psychiatric illness and intoxication on injury severity and the duration and complexity of hospital stay in orthopaedic patients.

Hypothesis: Psychiatric illness and/or intoxication worsen injury severity and increase duration and complexity of hospital stay in orthopaedic patients.

All orthopaedic admissions in July 2011 by the Emergency Department (ED) at SJH in Dublin had an electronic patient record (EPR), medical chart and Psychiatry Department database (PDDb) retrospective review. The EPR yielded information regarding radiological investigations (number, type and reports), the PDDb had information on all previous inpatients and consults seen and all other information could be obtained from patient charts (including multi-disciplinary team (MDT) components, non-psychiatric consults, admission and discharge information). Eighty patients were admitted during this period.

Patients were categorised on the basis of their review into four groups, as shown in Table 1. Those with no psychiatric illness and not intoxicated on admission (Group 1), those with psychiatric illness as a co-morbidity defined by DSM-IV criteria and assigned by a consultant

psychiatrist (Group 2), those with a defined psychiatric illness directly causing their injury (Group 3) and those in a state of intoxication (alcohol and/or drug) (Group 4). Abbreviated injury scores were assigned in accordance with the AIS 2005 Manual by the orthopaedic consultant and from this injury severity scores (ISS) were calculated (10).

Complexity of hospital stay was based upon a number of factors including duration of stay, number of radiological investigations and number of theatre procedures.

Statistical analysis

Statistical analysis was carried out with 95% confidence intervals.

Results

A total of 80 patients were reviewed. Sixty-five patients had no psychiatric illness and were not intoxicated on admission (Group 1) and their statistics were used as a baseline for comparison with the other three groups. Fifteen had a psychiatric co-morbidity (Group 2), eight patients had a psychiatric illness which had directly caused their injury and hence the reason for admission and fifteen patients were in a state of intoxication on admission. Some patients fell into more than one group and so were included in both.

First, we looked at psychiatric illness and its effect by comparing it with our baseline for Group 1. Psychiatric co-morbidity (Group 2) accounted for three times longer average duration of hospital stay (5.95, 20.1) and double the number of theatre procedures (0.64, 1.27). Also, over twice the number of radiological investigations (XR, Ct and MRI) was carried out on average per patient in Group 2 compared with Group 1 (1.0, 2.36).

These results, however, are over shadowed by the patients whose injury was directly caused by their psychiatric illness (Group 3). Group 3 had a six times greater average duration of stay when compared with Group 1 (5.95, 34.88) and also had three times the number of theatre procedures (0.64, 2.13), twice the number of MDT components involved in patient care (1.14, 2.63) and three and a half times the number of radiological investigations per patient (1.0, 3.5).

When we reviewed Group 4 it was evident that if a patient was injured while intoxicated (alcohol and/or drug) it caused a threefold increase in duration of hospital stay (5.95, 17.43), a 25% increase in average number of radiological investigations per patient (1.0, 1.23) and a threefold increase in non-psychiatric in-hospital consultations (0.214, 0.875) (cardiology, nephrology, etc.).

Mean injury severity scores were highest in Group 3 (7.88); then Group 2 (6.87) and then Group 1 (5.34), revealing worsening injuries associated with psychiatric illness. As shown in Figure 1 below, overlapping 95% confidence limits (CL) show that no significant difference exists in ISS between Groups 1,2 and 3. Intoxication had no impact on injury severity.

Figures 1 and 2 show an obvious trend in that duration and complexity of hospital stay increase with co-morbid and injury-causative psychiatric illness. Figure 2 also clearly shows how complexity of hospital stay was much higher in Group 3 compared with Groups 1 and 2;

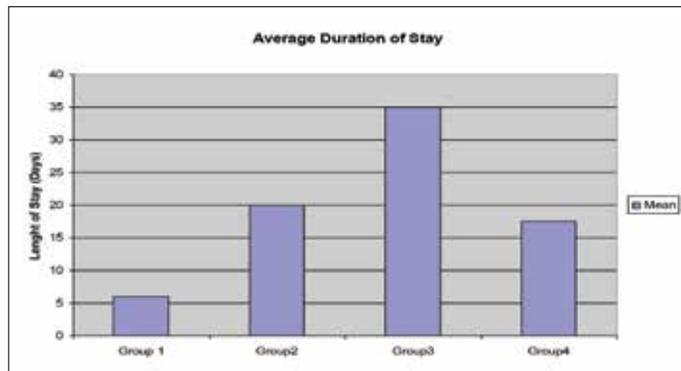


Figure 1. Average length of stay per patient in each of the four groups

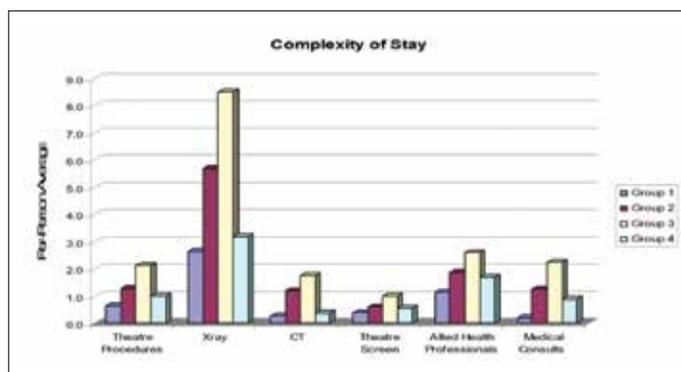


Figure 2. Complexity of hospital stay for patients in each of the four groups. It is based on parameters such as theatre procedures, radiological investigations and input from other in-hospital services (per patient average)

there was an overall increase in radiological investigations, theatre procedures and involvement of other hospital staff in the care of patients in Group 3.

Figure 3 shows the means and overlapping 95% confidence intervals of the injury severity scores for the four groups. Unfortunately overlapping 95% CL means that no statistically significant difference exists between the injury severity scores of the four groups.

Discussion

Our results show that there is a trend (but no significant relationship) between psychiatric illness, injury severity and increasing duration & complexity of hospital stay.

It is important to note that a wide range of results within each group has given rise to large standard deviations (SD). These large SDs have led to overlapping 95% CL and hence no 'significant' difference in duration & complexity of hospital stay or ISS between the four groups. We can therefore accept the null hypothesis on the basis of our findings:

Psychiatric illness and/or intoxication did not worsen injury severity or increase duration and complexity of hospital stay in orthopaedic patients.

The large standard deviations seen in the results highlight a wide range of values within Groups 1 to 4. Taking Group 3 as an example, ISS showed a range of 0 to 29, mean of 7.88, SD of 9.03 and median of four. This wide range reflects the fact that some psychiatric illnesses may lead to worse injuries than others and therefore greater ISS and longer and more complex hospital stays:

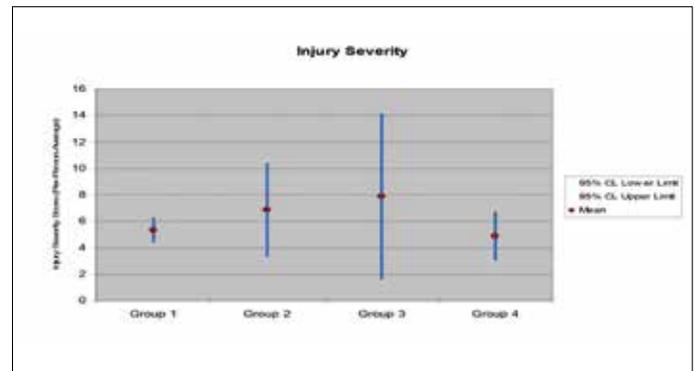


Figure 3. Means and 95% confidence intervals of the injury severity scores for the four groups

E.g.1. Patient 'X' from Group 3

- Injury owing to an acute psychotic episode
- Patient jumped 30 feet from a building.
- ISS=29
- Duration of stay=51 days
- Number theatre procedures=6
- XR 37, CT 12, MRI 2.

E.g.2. Patient 'Y' from Group 3

- Injury owing to addiction to heroin-self-injection
- Injection site cellulitis with abscess formation
- Injury severity score=1
- Duration of stay=6 days,
- Number theatre procedures=2
- XR 1, CT 0, MRI 0.

Clearly, in these examples it can be seen that an acute psychotic episode has a much greater effect on ISS and the duration and complexity of hospital stay than self-injection owing to an addiction to heroin. These differences within each group have not been accounted for in this study and so have led to difficulties in data interpretation.

Another limitation of the study was its sample size. Since we only studied 80 patients over a one-month period, significant patterns and trends within the groups may not be apparent. For example, although the results show an increase in injury severity scores and the duration and complexity of hospital stay in orthopaedic patients with co-existing psychiatric illness the level is not significant. Increased power should be possible if a larger sample size is used for a longer period and prospectively.

One way to develop this study (albeit requiring a much larger cohort of patients) would be to split Group 2 and 3 into specific psychiatric illnesses based on their DSM-IV diagnosis. By splitting the groups one could see which specific psychiatric illnesses worsened ISS and complicated hospital stay the most. By having these smaller more similar groups, ranges and standard deviations may have been reduced and thus, statistical significance may have been shown.

We would therefore suggest further study of this important relationship in the form of a prospective, (multi-centre) long-term study.

Conclusion

The results of this initial study have outlined a clear trend in how psychiatric illness can in fact worsen injury severity and thus prolong and complicate hospital stay. The results are not significant owing to flaws in the study design but pave the way for future research to es-

establish a link between psychiatric illness and worsening morbidity of orthopaedic patients.

Conflict of Interest / Çıkar Çatışması

No conflict of interest was declared by the authors.
Yazarlar herhangi bir çıkar çatışması bildirmemişlerdir.

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