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Comparative study of psychiatric disorders in general traumatism and brain injuried patients

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Introduction. This study evaluates the presentation of different psychiatric pathologies secondary to traumatic injuries; assessing the presentation frequency and how it correlates with whether it is a brain injury (TBI) or one in a different corporal area.

Methods. The study group consisted of 249 patients, 122 with TBI and 127 with injuries from different body areas. The patients conditions were evaluated at baseline and at 6 and 12 months after the traumatic episode. Psychiatric diagnosis was made using a structured clinical interview and DSM-IV criteria.

Results. Depressive and anxiety disorders were observed in frequencies similar to prevoius reports; without significant differences between TBI and non-TBI groups. The organic change of personality was significantly more frequent among patients with TBI than among the non-TBI with apathy features. There was a significant decrease in quality of life one year after the traumatism in both groups.

Conclusions. Psychiatric disease is a frequent complication of injured patients; and it is associated with deterioration of general health and quality of life. TBI patients have more probability of developing an organic change of personality.

Key words:
Trauma. Brain injury. Psychiatric disorders.

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Estudio comparativo de patología psiquiátrica en pacientes con traumatismos generales y traumatismos craneoencefálico

Introducción. El presente estudio evalúa diferentes patologías psiquiátricas asociadas a lesiones de origen traumático; su frecuencia de presentación, y la forma como se correlacionan según se trate de un traumatismo craneoencefálico o de zonas diferentes al cráneo.

Métodos. Se trata de un estudio de cohorte prospectiva con una muestra de 249 pacientes: 122 con traumatismo craneoencefálico y 127 con lesiones de otras zonas corporales. Se entrevistaron al ingreso en el centro, con seguimiento a los 6 y los 12 meses de la lesión.

Resultados. La incidencia de depresión y trastornos de ansiedad fue similar a la obtenida en estudios previos, sin diferencia significativa entre los pacientes con traumatismos craneoencefálicos comparados con los traumatismos generales. En ambos grupo hubo un descenso significativo de la calidad de vida, así como un incremento en los problemas con el alcohol al año del traumatismo. Entre los lesionados cerebrales se detectó con mayor frecuencia el cambio orgánico de la personalidad con síntomas de apatía.

Conclusiones. La incidencia de trastornos psiquiátricos en el paciente con lesiones traumáticas es alta y contribuye de forma importante a un deterioro en el estado de salud y la calidad de vida del enfermo. Los pacientes con lesiones cerebrales tienen mayor probabilidad de desarrollar un cambio orgánico de la personalidad.

Palabras clave:
Traumatismo. Lesión cerebral. Patología psiquiátrica.

INTRODUCTION

The increase in survival of the injured patient makes us to deal more frequently with physical as well as mental sequels[1,2].

For the patient, the traumatic injury does not end with the intervention of the acute event, since different needs arise after this time, needs which in many cases, if not treated, worsen and may give rise to new disorders[3]. That is why the therapeutic team must detect and approach the emotional and psychiatric disorders that occur from the initial phase in order to make easy the patient's reinsertion in his/her social, family and occupational setting[4,5].

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METHODS

Study population

The present study was performed with patients who came to the University Hospital San Vicente de Paul; tertiary center in the city of Medellín, Colombia. The sample size was calculated using the EPIINFO 6.0 program. For their inclusion, we consecutively included 249 patients diagnosed of traumatic injury in the Emergency Service.

Of this initial group, 122 had suffered traumatic brain injury (TBI) and 127 general traumatisms in different body areas (non TBI).

Exclusion criteria were considered to be refusal to participate after having been informed, distant place of residence or difficulty for access, traumatism occurring due to suicide attempt and speech or communication disorder that makes it impossible to carry out the interview.

All the patients were assessed by personal interview during the acute phase of hospital admission, at six and twelve months of the event. The participants did not receive any economic compensation.

The interviews were performed by psychiatry residents and last year medical students, who performed a pilot test and received training in the instrument application.

At six months of follow-up, 88 patients with brain injury (52.3%) and 80 patients with general traumatism (47.7%) and at one year 65 (50.4%) and 64 (49.6%) respectively, were evaluated. The final group was made up of 51.8% of the initial sample with an equal rate of individual loss for both cohorts. The most frequent causes of patient loss were change of home without reporting it (n = 52; 43%), voluntary withdrawal (n = 31; 26%), death (n = 25; 21%) and imprisonment (n = 12; 10%).

An important proportion of the traumatisms occurred as a consequence of violent criminal type acts, which determined the impossibility of following-up many subjects who had to move to another home as a way of protection or who were taken to prison due to their involvement in the events.

Information sources and instruments used

Table 1 summarizes the questionnaires and interviews used as well as the phase in which they were administered and the information source.

Statistical analysis

Initially, the univariate analysis was performed. To do so, the sample was separated into exposed and non-exposed subjects. Cohorts were compared with the chi squared or F test. Then an analysis was performed with the variables that were associated, so a multiple regression model was used in order to determine the respective associations.

RESULTS

General characteristics of the sample and psychopathological background

We found no differences between the two patient groups in regards to gender, civil status or schooling. Those suffering

Table1 **Instruments used in the three study phases**

Admission	Six and twelve months of the traumatism	Information source
Sociodemographic data and background, psychoactive consumption, traumatism data, Injury Severity Score (ISS), Trauma Score (TS), Glasgow scale		Clinical history Patient Informer
Problems with alcohol (CAGE)	Problems with alcohol (CAGE)	Patient Informer
Previous personality traits	Personality traits after traumatism	Informer
	Cognitive impairment (Mini-Mental Test)	Patient
Health state (SF-36)	Health state (SF-36)	Patient Informer
Functioning (GAF)	Functioning (GAF)	Patient Informer
	Psychopathological interview DSM-IV (CIDI: sections D and E)	Patient Informer

traumatic brain injury (TBI) tended to be older (mean age TBI: 32.5 years [95% CI: 29.5, 35.4] and non TBI: 28.1 years [95% CI: 25.9, 30.2]). Schooling in most of the subjects was less than incomplete secondary education.

In addition, the previous psychopathological characteristics of both cohorts showed no significant differences (table 2).

Characteristics of the traumatic injuries

Severity of the injury measured with the Injury Severity Score (ISS), Trauma Score (TS) and Glasgow scale was greater among patients with brain injury than in those with different traumatisms, there being a greater rate of closed injuries due to traffic accidents and falls. In this group, there were more cases of post-traumatic amnesia and delirium in the acute phase.

Patients with general traumatisms mainly suffered penetrating wounds as they were victims of firearm or knife aggressions (table 3).

Problems with alcohol consumption

This aspect was evaluated with the CAGE questionnaire, the Brief Michigan Alcoholism Screening Test[6], a screening test for alcohol problems.

When we analysed the evolution in each group separately, we found that the drinking problems did not decrease after the traumatism, but rather tended to increase significantly, especially at six months (binomial test CET: p = 0.041; non CET: p = 0.021)

Personality traits

We determined a personality profile by recording the patient's traits prior to and after the traumatism. To do so, we considered the eight groups described by the DSM-IV[7] in the diagnosis of «personality change due to...»: disinhibited, labile, apathetic, paranoid, aggressive and other forms. In the latter group, traits such as not being aware of the disease, not having adequate judgment of reality, fatigability, and impatience were included. Figures 1, 2 to 3 show how the personality traits evolved after the injury in regards to the previous personality.

Among patients with brain injury, there was a significant increase at six months in aggressiveness, apathy and «other forms» group traits (binomial test: p = 0.017, p = 0.000 and

Table 3 Injury characteristics

Variable	TBI (n = 122)	Non-TBI (n = 127)	Significance
Severity			
ISS	15,34 (de 10,01)	8,99 (SD: 7,13)	F = 28,37; p = 0,00
RTS	7,04 (de 1,10)	7,57 (SD: 0,58)	F = 18,09; p = 0,00
Glasgow	11,58 (de 4,05)	14,33 (SD: 1,99)	F = 47,73; p = 0,00
Penetrating injury	41 (36,6 %)	88 (75,2 %)	F = 0,00; p = 0,00
Cause of injury			
Cause of injury	22 (18,5 %)	82 (66,7 %)	X^{2}_{gl3} 65,54; p = 0,000
Aggression			
traffic accident	74 (62,2 %)	31 (25,2 %)	
Fall	22 (18,5 %)	5 (4,1 %)	
Others	1 (0,8 %)	5 (4,1 %)	
Amnesia			
Less than 24 h	45 (42,9 %)	37 (30,3 %)	X^{2}_{gl2} 72,83; p = 0,00
From 24 h to 7 days	40 (38,1 %)	2 (1,6 %)	
Delirium	9 (8,0 %)	0	F = 0,001; p = 0,01

SD: standard deviation.

Table 2 Psychopathological background

Variable	TBI (n = 122)	Non-TBI (n = 127)	Significance
Psychopathological background	9 %	7,1 %	F = 0.379 p = 0.6008
Psychoactive use			
None	72.4 %	65.5 %	Chi 1.30; p = 0.25
Marihuana	9.5 %	15.1 %	Chi 1.80; p = 0.17
Cocaine	4.3 %	5.9 %	Chi 0.4; p = 0,64
Risk of alcohol abuse or dependence	37 (30.3 %)	27 (21.3 %)	X^{2}_{gl3} 3.28 p = 0.349

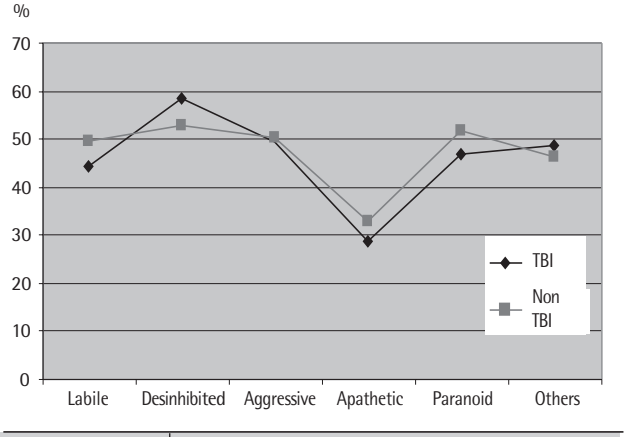

Figure 1 *Personality traits on admission to the study.*

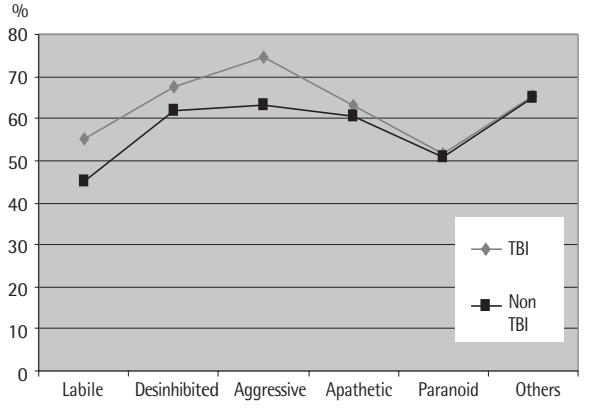

Figure 2 *Personality traits at six months of the traumatism.*

p = 0.001). At one year of the injury, the only trait that persisted significantly was apathy (binomial test: p = 0.003).

Patients with general traumatisms also had a significant increase of apathy with traits such as lack of motivation, withdrawal, lack of initiative and passiveness at one year of the injury.

Cognitive functioning

In order to control the cognitive state, we applied the Minimental State Examination (MMSE) or Folstein Scale[8] at six and twelve months of the injury. We did not find any differences between the two groups, both of whose mean functioning was within normality limits.

Psychiatric diagnoses

We evaluated the presence of depression and anxiety disorders with The Composite International Diagnostic Interview[9] (CIDI; sections D and E), instrument to make psychopathological diagnoses based on the DSM-IV criteria.

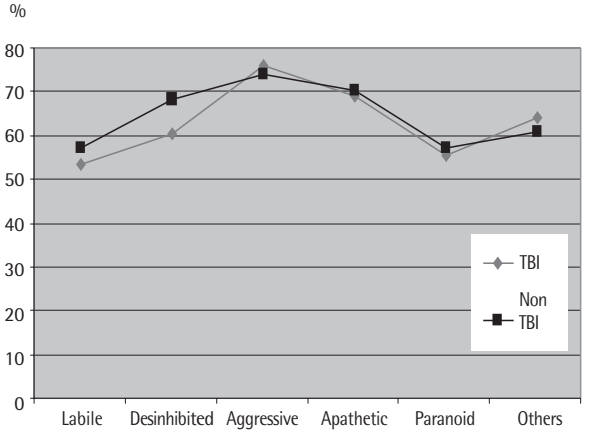

Figure 3 *Personality traits at one year of the traumatism.*

Table 4 Psychopathological diagnoses

Diagnoses	TBI	Non-TBI	Significance tests
Depression	Prevalence: 28 (32.1%) Incidence: 24 (27.6%)	Prevalence: 24 (31.6%) Incidence: 17 (22.4%)	p = 1.00
Panic disorder	Prevalence: 4 (4.5%) Incidence: 3 (3.4%)	Prevalence: 7 (8.8%) Incidence: 4 (5%)	p = 0.353
Generalized anxiety	Prevalence: 2 (2.2%) Incidence: 2 (2.2%)	Prevalence: 3 (3.9%) Incidence: 2 (2.6%)	p = 0.664

Both the prevalence as well as incidence obtained for depression and anxiety disorders are similar to the values reported in other studies[10,11]. We did not find significant differences according to whether it was a cranioencephalic or different area traumatism (table 4). Figure 4 shows the incidence of psychiatric disease in the sample studied.

Perception of health state

Using the Short Form Health Survey (SF-36)[12], we obtained a health status profile for both physical as well as emotional features. The instrument assesses the following aspects on a scale of 0-100:

- Physical function: interference of physical health with work or other daily life activities.
- Emotional role: interference of emotional problems with work or other daily life activities.
- Social function: interference of physical or emotional health with normal social activities.

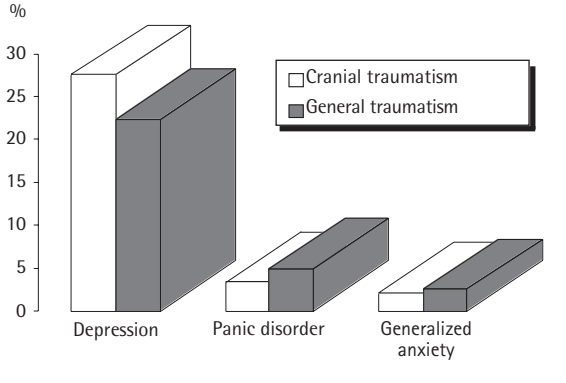

Figure 4 *Psychiatric disorders from traumatism.*

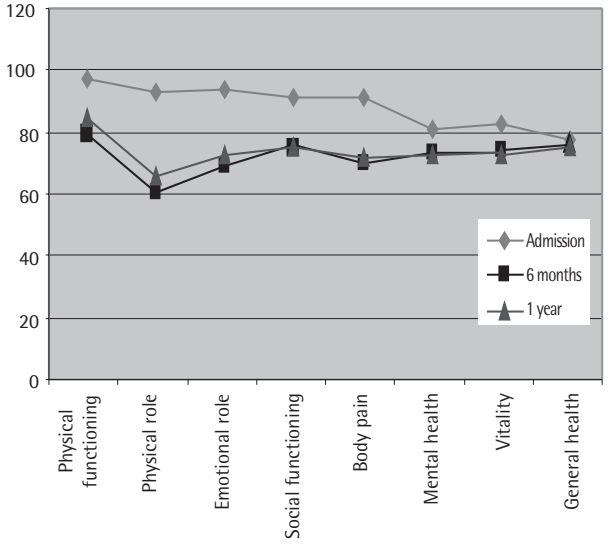

Figure 5 *Perception of health state in TBI patients.*

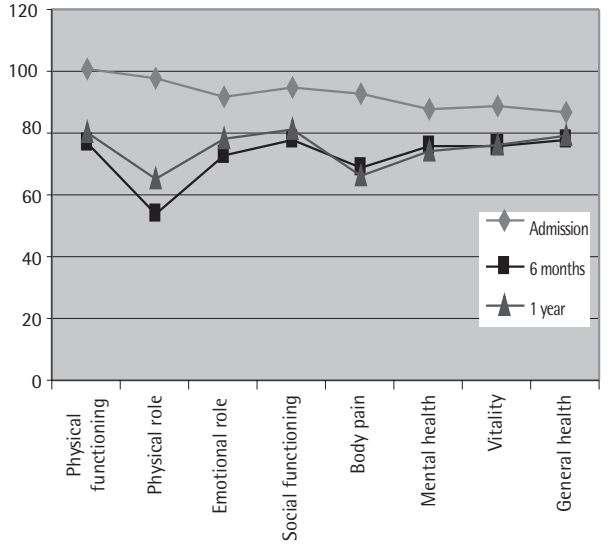

Figure 6 *Perception of health state in non TBI patients.*

- Bodily pain: intensity of pain and its effects.
- Mental health: general mental health including depression, anxiety, behavioral and emotional control.
- Vitality: sensation of energy and vitality versus tiredness and exhaustion.
- General health perception: current health state and resistance to the disease.

All the individuals had a significant decrease in their health state at one year of the traumatism if compared with the previous state. This occurred in seven of the eight dimensions evaluated, both if dealing with cranioen-cephalic traumatism as well as another type of traumatism (figs. 5 and 6).

Functionality

The effect of the psychic symptoms in social, psychological and occupational aspects was measured with the Global Assessment of Functioning (GAF)[13]; scale from 1 to 100 points that does not include functioning deterioration given by the physical disease. There were no significant variations at six and twelve months of the injury and there were also no differences between the two cohorts (Mann Whitney test; $p = 0.099$).

DISCUSSION

Sample size, having obtained patients from the moment they came to the emergency service and having made up two groups, including patients with injuries having different severity, stand out among our study's strengths.

As has been reported in studies of patients with trauma, the persons most frequently affected are young male individuals.

On the contrary to other studies, we did not find a major frequency of psychiatric background or alcohol abuse between the patients with cranioencephalic traumatism versus those who had suffered different traumatisms. This could be due to the low sensitivity of the instruments used or to the specific characteristics of the sample studied. However, tendency to increased alcohol consumption in both patient groups at one year of the traumatism should be stressed.

The patients with general traumatisms mostly came from general surgery, orthopedics and urology, the most frequent diagnosis being penetrating chest and abdomen wound from firearm and knife. This fact indicates violence as one of the first causes of traumatic injuries in our setting.

Within the brain injury group, traffic accidents, especially motorcycle, firearm aggressions and falls in elderly subjects were the most frequent causes of the injury.

In regards to the psychiatric diagnoses, we want to stress that anxiety and depression disorder diagnoses were obtained by semistructured clinical interview based on DSM-IV and ICD-10 criteria. The former allows us to state that the data obtained have an optimum validity and can be compared with other populations.

The prevalences of depression in our study are similar to those found in patients with traumatic brain injury[14,15] and in general traumatisms[1], while anxiety disorder prevalences are lower.

Given that there is no standardized instrument that makes it possible to assess the diagnosis of personality change due to medical disease up to now, we elaborated a questionnaire based on the features described in the DSM-IV, which was revised by a group of psychiatrists.

As limitations of this research, we should mention that the sample obtained eliminar represents a certain population area, which does not make it possible to extrapolate some of the conclusions. We also had a high percentage of patient losses, the accumulated total being 48.5 % at one year of the traumatism. However, we found that follow-up studies in patients with trauma had similar drop-out percentages[15].

In regards to the instruments used, the diagnosis of alcohol problems with alcohol was made with the CAGE, a sensitive but not very specific screening test, which allowed us to know the tendency in alcohol consumption without being able to be more precise about it.

We also used the minimental test as a screening test eliminar to assess cognitive functioning. It allowed us to control severe cognitive impairment that hindered reliable response to the interview.

Among the psychopathological diagnoses, we did not consider the post-traumatic stress disorder from the onset. However, it would have been important to evaluate it not only due to the characteristics under which many of the injuries occurred but also in order to make the differential diagnosis with the panic attack that we include in the study.

CONCLUSIONS

There is a high incidence of psychiatric disorders in the patients with trauma, both regarding a brain injuries as well as general traumatism.

In this population, there is a significant decrease in the health state that limits the patient in the development of daily life activities, work and social reactions. Undoubtedly, both physical as well as emotional aspects play a role. Depression, which was the psychiatric disorder most frequently diagnosed, is included among the latter.

In the case of the patients with traumatic brain injury, the relatives frequently described the appearance of personality changes, which, according to our study, persists at one year of the injury.

Finally, with the results of this investigation, we want to denote to the specialities involved, the need to evaluate and bear in mind the emotional aspects that contribute to the worsen in the health state, functioning and life quality of the patient suffering a traumatic injury.

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