FORENSIC ISSUES OF DEATHS DUE TO CRANIOCEREBRAL TRAUMA IN SIBIU COUNTY - RETROSPECTIVE STUDY BETWEEN 2007 AND 2016

COSMIN CÂRSTOC[1], IOANA PETEANU[2], ELENA TOPÎRCEAN[3], LORANT KISS[4]

[1]PhD candidate, "Lucian Blaga" University of Sibiu, [2,3,4]"Lucian Blaga" University of Sibiu

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Abstract: *Purpose: Deaths due to craniocerebral trauma are a global problem that affects all sectors of society. Materials and methods: We conducted a longitudinal retrospective study over a 10-year period, on a total of 327 cases, from the casuistry of the Sibiu County Forensic Service. We followed the epidemiological distribution by age groups, gender, origin environment, distribution of cases according to circumstances they occurred, production mechanism and death-inducing syndromes of craniocerebral trauma. Results: The study found that nearly one-third of all deaths following mechanical traumatic lesions were due to craniocerebral trauma. Most of these deaths occur more frequently in men and in urban people. Also, an important part of these traumas occurred as a result of domestic accidents, by simple falls.*

INTRODUCTION

Deaths due to craniocerebral trauma have a large economic and social impact (1,2,3), requiring effective prevention measures.(4,5,6) In the vast majority of cases, the traumatic death-inducing injuries result from domestic, road, work accidents (6,7), but an important part is related to aggression.(8,9,10) A significant percentage of deaths due to craniocerebral trauma in noted in children.(9,11)

PURPOSE

The paper aims at performing a retrospective epidemiological study on the deaths related to craniocerebral trauma in Sibiu County for a period of 10 years, between 2007 and 2016, in order to quantify the phenomenon, production circumstances, identification of risk groups and last but not least, to develop a prevention strategy.

MATERIALS AND METHODS

The material taken into study is represented by the infobiographic and medical data available in the archives of the Sibiu County Forensic Medicine Service, as well as the Sibiu County Clinical Emergency Hospital. The method used is the retrospective longitudinal survey, with the complete study of the study material.

RESULTS AND DISCUSSIONS

Between 2007 and 2016, 327 deaths due to craniocerebral traumas were recorded in the County Clinical Emergency Hospital of Sibiu and in Mediaş Forensic Office.
Out of the total deaths from craniocerebral trauma, 82.87% were recorded in met and only 17.12% in females.

Table no. 1. Distribution of deaths due to craniocerebral traumas according to gender

Gender	No.	%
Masculine	**271**	82,87
Feminine	**56**	17,12
Total	**327**	**100**

Following the distribution of cases according to the deceased's origin environment, following a cerebral trauma, there have been obtained 56.57% for the urban environment and 43.42% for the rural area.

The highest share of deaths from craniocerebral trauma was recorded in the eighth decade of life (19.87%). Approximately equal shares were found in the age groups of 40-49 years (17.12%), 50-59 years (15.90%) and 60-69 years (17.43%), respectively. Significant percentages were recorded in the decades of 20-29 years (8.56%) and 30-39 years (7.03%), respectively. In the first and second decades, there were 2.75%, respectively 3.05% deaths.

Table no. 2. Repartition of deaths secondary to craniocerebral traumas according to the victim's age

Age (years)	No.	%
0-9	9	2,75
10-19	10	3,05
20-29	28	8,56
30-39	23	7,03
40-49	56	17,12
50-59	52	15,90
60-69	57	17,43
70-79	65	19,87
Above 80	27	8,25
Total	**327**	**100**

Mostly, 57.49% deaths from craniocerebral trauma occurred as a result of a domestic accident, followed by a death rate of 28.13% by road accidents. A share of 4.28% was secondary to aggression, and 8.86% of work-related accidents. 1.22% of the total deaths from craniocerebral trauma were found to be suicides.

Following the distribution of deaths from craniocerebral traumas depending on the mechanism of production, the maximum weight was represented by falls (57.79%), followed by injuries produced by hitting from hard

[2]Corresponding author: Ioana Peteanu, Str. Aurel Decei, Nr. 1, Sibiu, E-mail: ioana_peteanu@yahoo.com, Phone: +40723 663124
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objects and compression (in the case of road accidents to passengers) (22.62%). 8.86% of deaths were caused by the hitting with a hard object, while 4.89% of deaths resulted from falling from height. The mechanisms of falling on hard surfaces (including pedestrian injuries) represented 2.44%, compression mechanisms (other than road accidents) represented 2.14% and shooting - 1.22%.

Table no. 3. Repartition of deaths due to craniocerebral traumas according to the circumstances they occurred

Circumstances	No.	%
Suicides	**4**	1,22
Domestic accident	**188**	57,49
Road accident	**92**	28,13
Aggression	**14**	4,28
Work accident	**29**	8,86
Total	**327**	**100**

Table no. 4. Repartition of deaths due to craniocerebral traumas according to the mechanism of production

Production mechanism	Nr.	%
Falling	**189**	57,79
Fall from height	**16**	4,89
Compression	**7**	2,14
Hitting from a blunt object	**29**	8,86
Hitting from a hard object and compression	**74**	22,62
Shooting	**4**	1,22
Collision	**8**	2,44
Total	**327**	**100**

The study of mechanical traumatic tanatogenesis revealed that the main anatomo-pathological entity involved is meningo-cerebral haemorrhage (58.10%), followed by bronchopneumonia occurring as a result of the development of craniocerebral lesions (14.98%) and cerebral dilaceration (12.23%). A percentage of 2.75% was represented by mechanical asphyxia by pulmonary aspiration secondary to craniocerebral traumas, while cranial crushing, subcutaneous hematomas and post-traumatic meningitis had an equal weight (0.61%). The smallest weight (0.30%) corresponded to pulmonary thromboembolic complications.

Table no. 5. Distribution of deaths according to death-inducing syndromes of craniocerebral traumas

Death-inducing syndromes	*Nr.*	*%*
Meningo-cerebral haemorrhage	**190**	58,10
Subdural hematoma	**13**	3,97
Extradural hematoma	**2**	0,61
Brain dilaceration	**40**	12,23
Skull crushing	**13**	3,97
Diffuse brain contusions	**2**	0,61
Diffuse brain edema	**2**	0,61
External haemorrhage	**2**	0,61
Hemorrhagic shock	**2**	0,61
Pulmonary aspiration	**9**	2,75
Pneumonia/Bronchopneumonia	**49**	14,98
Meningitis / meningo-encephalitis	**2**	0,61
Pulmonary thromboembolism	**1**	0,30
Total	**327**	**100**

CONCLUSIONS

One third of all deaths resulting from traumatic injuries were due to craniocerebral trauma.

Male predominance was recorded in the analyzed cases.

Urban people have recorded a high, over half of the deaths from cranio-cerebral trauma.

More than half of all deaths resulting from cranio-traumatic injuries occurred in the V-VIth age decades.

Nearly two-thirds of the deaths from craniocerebral trauma occurred as a result of domestic accidents.

As a mechanism for producing craniocerebral trauma, more than half of the cases have been produced by simple falls.

The most common death-inducing syndrome was the meningo-cerebral haemorrhage.

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