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CONSIDERATIONS ON POLYTRAUMATISM IN THE YOUNG ADULT

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Abstract

Trauma continues to be a major problem in the young, working-age population, so many societies have tried to improve polytrauma care methods. Over the last two decades, various systems have been published to facilitate the identification of treatment strategies for patients with multiple trauma. Safe and prompt individualized management (Prompt individualized safe management (PRISM)) is a new concept that includes the approach of each patient separately.

The main objectives of this study were to highlight the socio-demographic characteristics, clinical and paraclinical characteristics, and various risk factors of young adults with polytrauma. The study presented in this article was of a descriptive, retrospective type, including 1294 patients who presented themselves in the Emercency-department of the " Saint Andrei" County Emergency Hospital, Galaţi.

The data obtained from the statistical reports of the hospital and the presentation sheets of the patients, have been statistically analyzed using SPSS and MS Excell. There for, we have been able to analyze and to obtain statistically relevant results for the distribution of polytrauma cases, seasonality and evolution aspects regarding the toracoabdominal traumas (87.5%) and craniofacial traumas (76.8%), which have been the most frequent forms.

Key words: polytraumatism, injuries, avulsion, incidence, distribution

1. Introduction

Currently, the number of international polytrauma patients in hospitals remains very high (approximately 5.8 million deaths worldwide resulting from traumatic injuries), despite global efforts to reduce the number of road accidents. The need for advanced health care methods is imposed by the degree of severity and complexity of injuries, to decrease the morbidity and mortality rate [1].

Trauma continues to be a major problem in the young, working-age population, so many societies have tried to improve polytrauma care methods. Hypothermia, acidosis, and coagulopathy are the main physiological mechanisms occurring in a patient with polytrauma [2].

Between 2006 and 2012, within a consensus, guided by the members of several trauma societies, such as the American Association for the Surgery of Trauma (AAST), the European Society of Trauma and Emergency Surgery (ESTES), the German Trauma Society (DGU) Association of Orthopedic Trauma (OTA), the most important criteria for identifying patients with an increased risk of mortality were highlighted: patient age, AIS and ISS, low blood pressure values at the time of admission, GCS score at the time of admission to a medical service. and coagulopathy [3].

Over the last two decades, various systems have been published to facilitate the identification of treatment strategies for patients with multiple trauma. Some of them because they required a prolonged observation time (48 hours) was not considered possible to be used during the acute phase. The other 4 systems underwent various modifications, such as the exclusion of blood levels of D-dimer, fibrinogen, factor II and V, urinary output, and chest trauma score. The resulting new scale was named GCS (modified clinical grading scale).

Safe and prompt individualized management (Prompt individualized safe management (PRISM)) is a new concept that includes the approach of each patient separately according to sex, age, associated comorbidities, or other special conditions that could influence the way the case is managed [4].

2. Material and methods

2.1. Objective

The purposeof the study was to evaluate the incidence of cases of polytrauma that appears among young adult patients presented to the Emergency Department of the Saint Apostol Andrei Clinical Emergency Hospital. This incidence was assessed in association with various individual factors.

The objectives of the study were to highlight the socio-demographic characteristics, clinical and paraclinical characteristics, and various risk factors of young adults with polytrauma. Finally, announced research was carried out on the impact of various elements on the evolution of the patients.

2.2.Study lot

The study carried out was of a descriptive, retrospective type, including 1294 patients who presented themselves in the UPU of the " Saint Andrei" County Emergency Hospital, Galaţi.

Inclusion criteria	***Exclusion criteria***
Age >18 years and <30 years	Age <18 years and >30 years
Presentation diagnosis in UPU: polytraumatism	Other presentation diagnoses
	Death declared before the hospital

2.3.Statistical methods

Using the statistical reports of the hospital and the presentation sheets of the patients, the data was collected. Later, these data were processed using statistical programs (MS Excel 2019 and SPSS ver.24.0). In any determination, the 95% significance threshold (confidence interval - CI95%) was taken into account.

The statistical variables included in the calculation were of a demographic type (age distribution, sex, place of residence) and calendar variables (year, month) were subjected to a descriptive statistical analysis with the detection of important markers for the studied group.

2.4. Result

2.4.1 Age distribution

The age of the patients included in the study card was between 18 and 30 years. In the following analyzes carried out, an average level of 25.35 was highlighted, to which a standard deviation of ±3.28 years is associated. The series of age values were homogeneous, as demonstrated by the result of the Skewness test (-0.236>-2).

Making a comparison according to the year of production of polytraumas, it is possible Observe that in 2017, the average age for the female patient showed an increased incidence (26.11 vs 25.17; p=0.056). It can also be observed that there were no significant differences in the average values of age according to gender (p>0.05).

Table 1 - Descriptive indicators of age (years) compared by sex and by years of study

Year of study/ Sex	Number of patients	Average	Standard deviation	standard error	Confidence interval 95%		Min	Max	p - Test F_{ANOVA}
					-95%CI	+95%CI			
All lot	1294	25,35	3,28	0,09	25,18	25,53	18	30	
2015									
Masculin	278	25,86	2,95	0,18	25,51	26,20	18	30	0,606
Feminine	54	25,63	2,94	0,40	24,83	26,43	18	30	
2016									
Masculin	238	25,46	3,05	0,20	25,07	25,85	18	30	0,979
Feminine	56	25,45	2,89	0,39	24,67	26,22	21	30	
2017									
Masculin	265	25,17	3,33	0,20	24,77	25,57	18	30	0,056

Feminine	55	26,11	3,15	0,43	25,26	26,96	18	30	
2018									
Masculin	271	24,97	3,69	0,22	24,53	25,41	18	30	0,231
Feminine	77	24,40	3,58	0,41	23,59	25,21	18	30	

2.4.2 Distribution by background and years of study

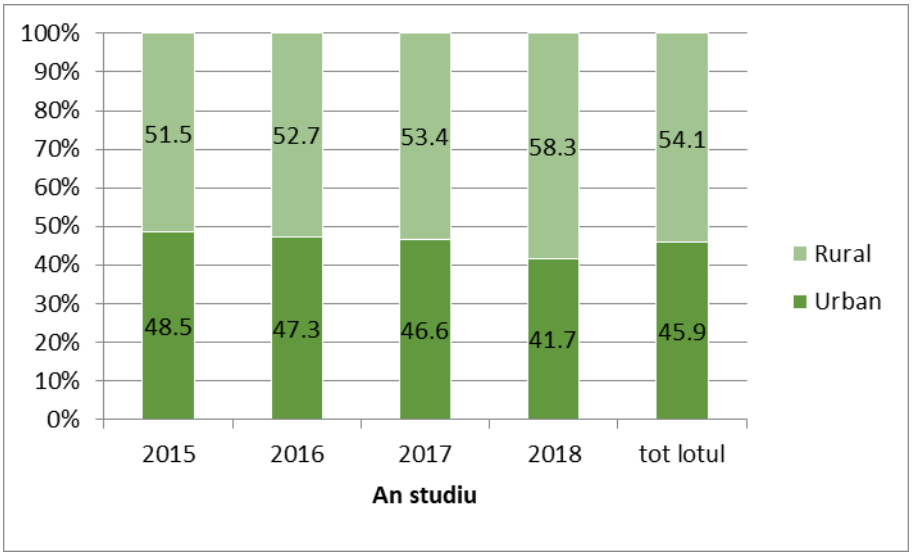
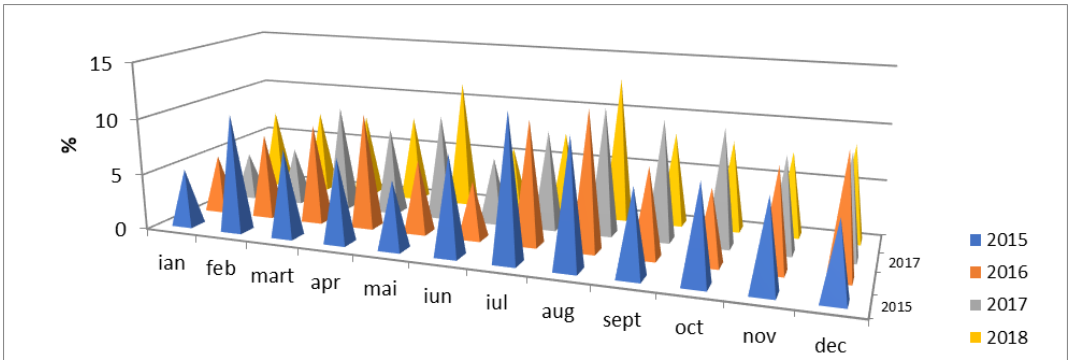


Figure 1. Distribution of cases usingthe origin

Following the analyzes carried out, an increased incidence of polytraumatism cases can be observed in the rural environment, a fact highlighted during the 4 years.

2.4.3.Distribution of polytraumas according to the month of presentation



	ian	feb	mart	apr	mai	iun	iul	aug	sept	oct	nov	dec
2015	5,1	10,5	7,8	7,5	6	8,7	12,7	11,1	7,5	8,4	7,8	6,6
2016	5,1	7,5	8,8	10,2	6,5	5,1	10,9	12,2	7,8	6,5	8,8	10,5
2017	4,1	5	9,4	7,8	9,4	5,9	8,8	11,3	10,6	10,3	8,4	9,1
2018	7,2	7,5	7,5	7,8	11,5	5,7	7,5	12,9	8,3	8	7,5	8,6

Figure 2. Distribution of cases by calendar month of presentation

After analyzing the figure presented above, we can see that in 2015, the most frequent presentations were recorded in July (12.7%) and August (11.1%); followed by April (10.2%) in 2016. Unlike these years, in 2017 the highest incidence of polytraumatism cases was recorded in October (40.3%). The year 2018 records an increased frequency in two months: May (11.5%) and August (12.9%).

By associating the gender of the patients with the calendar month of presentation, an increased incidence of polytraumatism is highlighted in May for the male sex (89.9%), compared to the female sex, which presents an increased incidence of cases in November (26.7%).

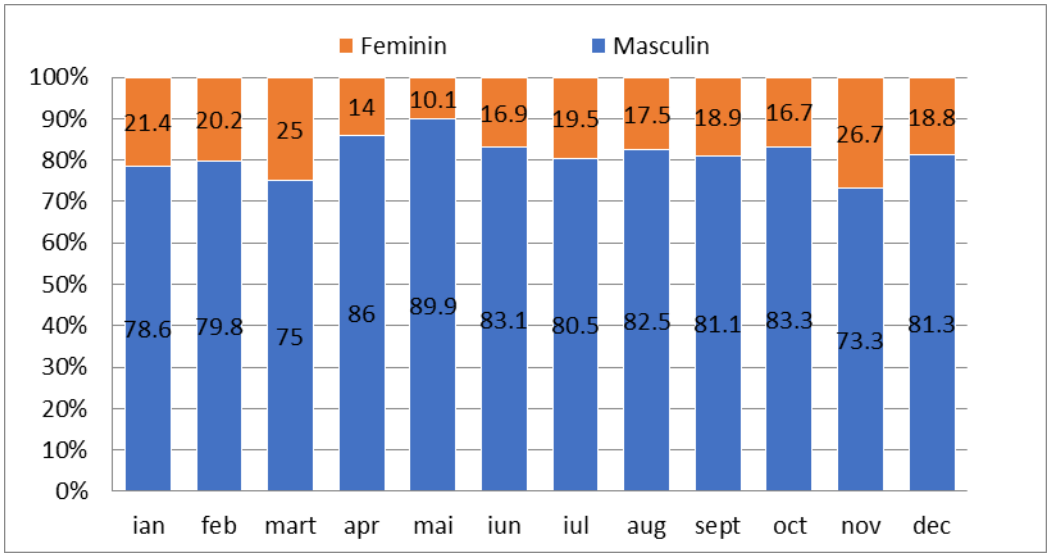
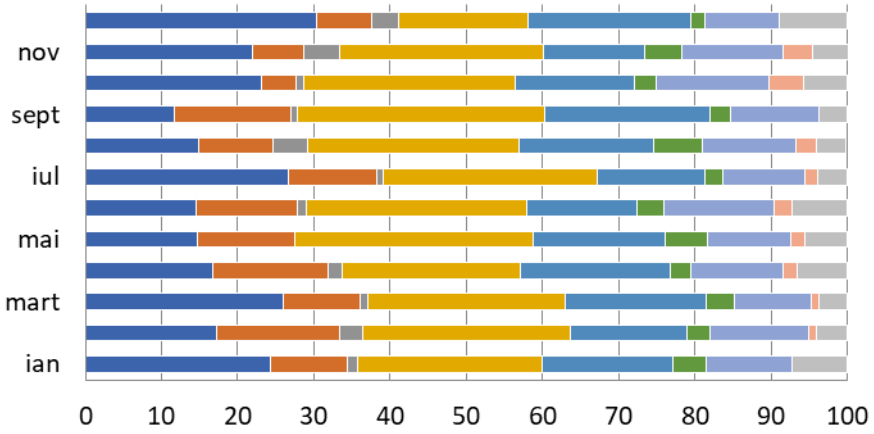


Figure 3. Distribution of cases by gender according to the month of presentation

2.4.4. Distribution of polytraumas according to the affected segments and the month of presentation



	ian	feb	mart	apr	mai	iun	iul	aug	sept	oct	nov	dec
traumatism cranio - cerebral	24.3	17.2	25.9	16.8	14.7	14.5	26.6	14.9	11.7	23.1	21.9	30.4
traumatism cranio - facial	10	16.2	10.2	15	12.8	13.3	11.7	9.7	15.3	4.6	6.7	7.1
traumatism coloană vertebrală	1.4	3	0.9	1.9		1.2	0.8	4.5	0.9	0.9	4.8	3.6
traumatism membru superior	24.3	27.3	25.9	23.4	31.2	28.9	28.1	27.9	32.4	27.8	26.7	17
traumatism membru inferior	17.1	15.2	18.5	19.6	17.4	14.5	14.1	17.5	21.6	15.7	13.3	21.4
infecție+hemoragie post traum.	4.3	3	3.7	2.8	5.5	3.6	2.3	6.5	2.7	2.8	4.8	1.8
traumatism toracic+abdominal	11.4	13.1	10.2	12.1	11	14.4	10.9	12.3	11.7	14.8	13.4	9.8
traumatism pelvin		1	0.9	1.9	1.8	2.4	1.6	2.6		4.6	3.8	
alte leziuni traumatice	7.1	4	3.7	6.5	5.6	7.2	3.9	3.9	3.6	5.6	4.8	8.9

Figure 4. Distribution of polytraumas according to affected segments and month of presentation

Comparing the 4 years of study according to the diagnosis at the time of presentation, the following particularities can be highlighted:

- ✓ In 2015, the most frequent traumas were located at the level of the limb superior (25.3%), followed by those at the cranial-cerebral level (23.8%).
- ✓ In 2016, traumas located at the level of the upper limb (25.3) and those from The cranial-cerebral level (18.7%) is still the most frequent, then closely followed by those located at the lower limb level (18%).
- ✓ In 2017, the order of traumas as well as the location remains the same but in percentages different: 29.7%-19.4%-16.3%.
- ✓ In the year 2018, injuries from the lower limbs remain in The first place is incidence (29.9%), but they are followed by those of the lower limbs (19.5%) and then the craniocerebral ones (18.4%).

Extremity trauma cephalic

Avulsion of the right upper limb

In the emergency reception service, the following were carried out: suturing of wounds, mounting of cast devices, orthopedic reductions, IOT, and central venous catheters.

The most frequent investigations carried out were radiographs at the level of different segments, in number 2783, followed by ultrasound examinations, carried out in number 986, and CT scans.

2.4.5. The evolution of patients in correlation with the incidence of segmental damage following polytrauma

Thoracic-abdominal injuries (87.5%) were the most frequently healed, then craniofacial ones (76.8%) and finally post-traumatic infections/hemorrhages (62.5%).

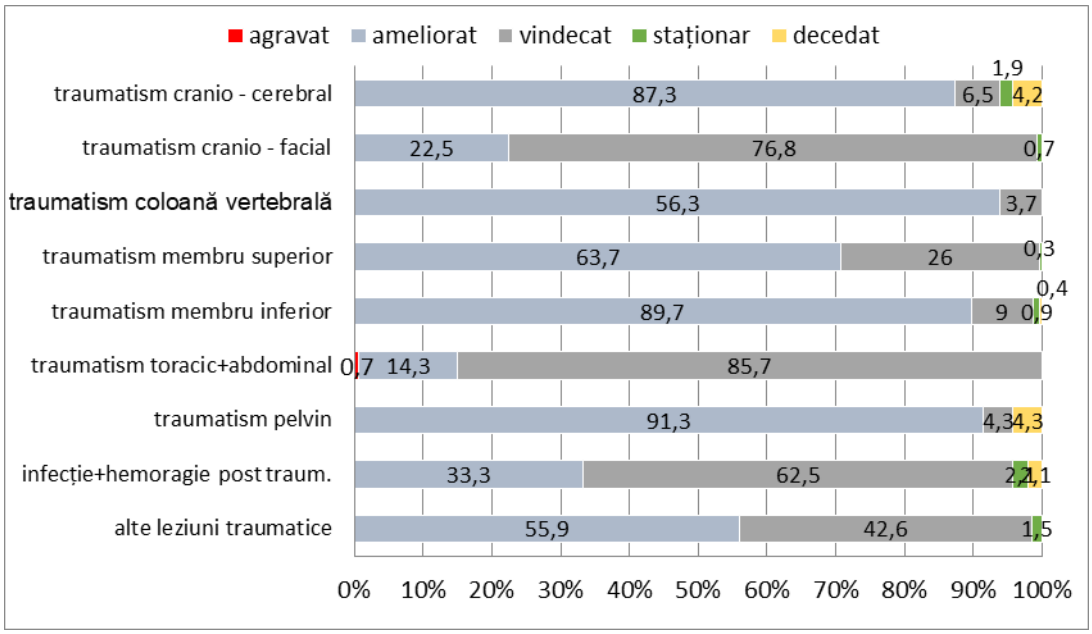


Figure 5. Evolution of patients in correlation with the incidence of segmental damage following polytrauma

3. Discussions

The evaluation and management of polytrauma patients have benefited from a multitude of innovations with time. The recovery of these patients requires a long time, but various factors can negatively influence their evolution: late treatment, unfavorable blood transfusions, and high-energy and complex traumas [6].

Within the studied group, we could observe a consistently high frequency during the 4 years of study, of upper limb trauma, but the highest frequency was recorded in May, at a percentage of 31.2%.

At the level of the Emergency Reception Unit, as well as investigations carried out, X-rays recorded the highest share, with several 2783. In addition to these, ultrasound examinations were also carried out, and not finally CTs.

Analgesia and sedation of polytraumatized patients were achieved with Mialgin, Midazolam, Propofol, and Ketamine. Anti-tetanus vaccination was also carried out for patients who presented wounds.

Extremity trauma continues to be a major health problem. In clinical practice, special attention is paid to injuries of the lower limbs, but the rest of the traumas should not be underestimated[6].

4. **Conclusions**

a) The distribution of polytrauma cases showed a slightly increased frequency in 2018, unlike the rest of the years. Regarding gender, male patients most frequently suffered various traumas, and the environment, the rural environment was the majority.
b) Regarding the month of presentation, the month of May presented a higher frequency of cases of polytrauma in the case of male patients (89.9%), compared to the female sex who registered a higher frequency during November (26.7%).
c) Related to the evolution of traumas, we could observe that thoracoabdominal traumas (87.5%) and craniofacial traumas (76.8%) ended in a high percentage with their healing.

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