

Clinical Characterization of Polytraumatized Motorcycle Accident Patients Admitted in the Orthopedics-Trauma area of Teodoro Maldonado Carbo hospital in Guayaquil in 2022

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Abstract

A Poly-traumatized patient is someone who presents injuries in two or more organs or systems of the body. Objective: to determine the characteristics of a polytraumatized patient due to a motorcycle accident in the orthopedics area of the HTMC in the second half of the year 2022. Methods: Descriptive, quantitative, cross-sectional, retrospective. Sample of 189 patients that was obtained using the Epi Info sample calculator, the data was obtained through medical records. Results: the place where the lesions mainly occur is in the pelvic extremities with 39.2%, according to Glasgow scale, the majority show a mild deterioration level of consciousness, 77.8%. On the other hand, according to the Gustillo scale, 63.5% of the wounds are type II. Conclusions: 79.9% of motorcycle accident patients are mostly male and are of productive age, which causes loss to families and the state. However, most injuries are minor and do not cause permanent injury.

Keywords: Patient, Polytraumatized, Motorcycle accident, Fractures, Cranioencephalic trauma.

Introduction

The polytraumatized patient suffers injuries in an accident on several organs or systems of the body, and these can also be visceral traumatic (García Celorio, 2017). On the other hand, an accident caused by a means of transportation, such as a motorcycle, can be described as an unintentional occurrence, however slight or serious damage to drivers or occupants. This can leave some of them with permanent aftermath. (Ramos Cavalcanti et al., 2020).

Motorcycle accidents occur for different reasons such as: speeding, which is one of the main factors, also due to the loss of control of the vehicle on curved roads, as well as wet asphalt due to rain, collisions with other vehicles, etc. The causes may depend on both the driver and external circumstances.

The most common injury among these drivers is getting broken bones, especially of the ones located in the arms and legs. This occurs because the driver, when pushed out of the motorcycle, falls over these areas of the body most of the time, which cushions the fall.

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Pelvic fractures due to the impact against gasoline tanks or central frames of the motorcycle are also frequent.

Brain injuries are also common and more serious, some can even be fatal or last for years. Milder injuries may involve momentary loss of consciousness. However, some drivers do not lose consciousness and do not go to the doctor for a more in-depth check, which can have long-term consequences.

Damage to the spine, spinal cord and internal organs after a motorcycle accident represents 10% of all injuries. As for the injury to the spinal cord, it can leave the patient paralyzed, this depends on the affected area. Damage to internal organs will require surgery in most cases.

The scales used in this investigation are: Glasgow scale, which is highly utilized to assess the neurological condition of patients with cranioencephalic trauma, the result can be mild, moderate or severe. Another scale used is the analog VAS pain scale. This scale is useful when evaluating the patient's. And finally, we have the Gustillo scale which can identify what type of injury the patient has ("Motorcycle accidents: causes and most common injuries", 2018a).

This investigation is of great importance because of the high amount of traffic accidents happening daily, and the difficulty and delay when it comes to recognizing the most common injuries in the polytraumatized patients.

The purpose of this work is to give information about the outcomes that can be found when encountering this type of patients, to know the clinical manifestations and to be prepared to treat the patients who had a motorcycle accident.

Materials and methods

The study used the quantitative approach, its descriptive and cross-section. It evaluates patients who are hospitalized for injuries caused by motorcycles accidents, at Teodoro Maldonado Carbo Hospital in the city of Guayaquil in the second half of the year 2022. There were 189 medical records used, this number was calculated using the Epi-info platform and the tabulation and data analysis was done using the SPSS program, version 22.

Results

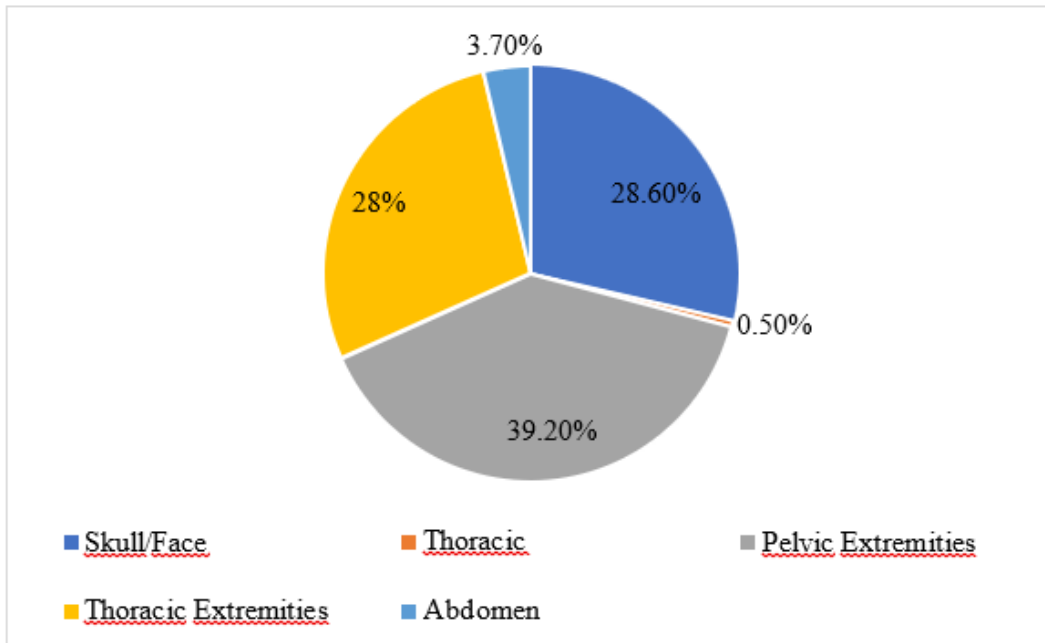


Figure 1. Percentage distribution by type of injurie

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

According to the study, injuries that are mostly occur in motorcycle accidents patients are mainly pelvic extremities. This represents 39.2%, followed by 28.6% skull / face, and 28.0% thoracic extremities. This indicates that both the upper and lower extremities are among the most affected in an accident. The second one, skull/face, is usually related to the lack of use of safety helmet (2018b, p. 2).

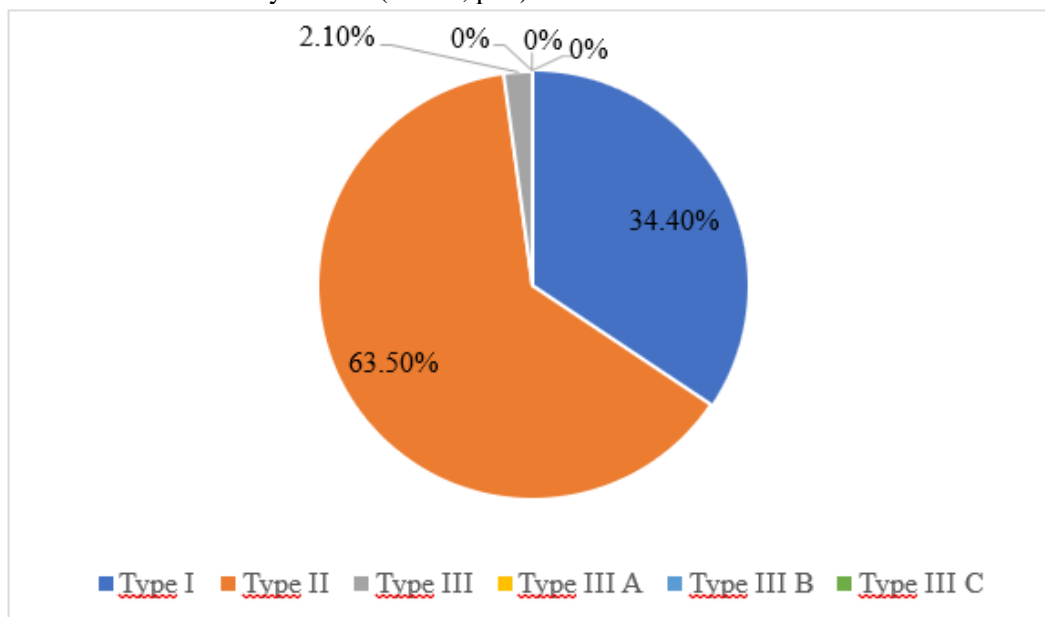


Figure 2. Percentage distribution of wounds according to Gustillo classification

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

According to Gustillo scale, the most frequent type of fracture is type II with 63.5%, which represents a wound of 1 to 10 cm, second is type I with 34.4%, and third is type III with 2.1%. This shows that most of the wounds found are minor wounds that will not cause major recovery problems for the patient because they are less than 10 cm in diameter. (Mite Lindao, 2019, p. 32).

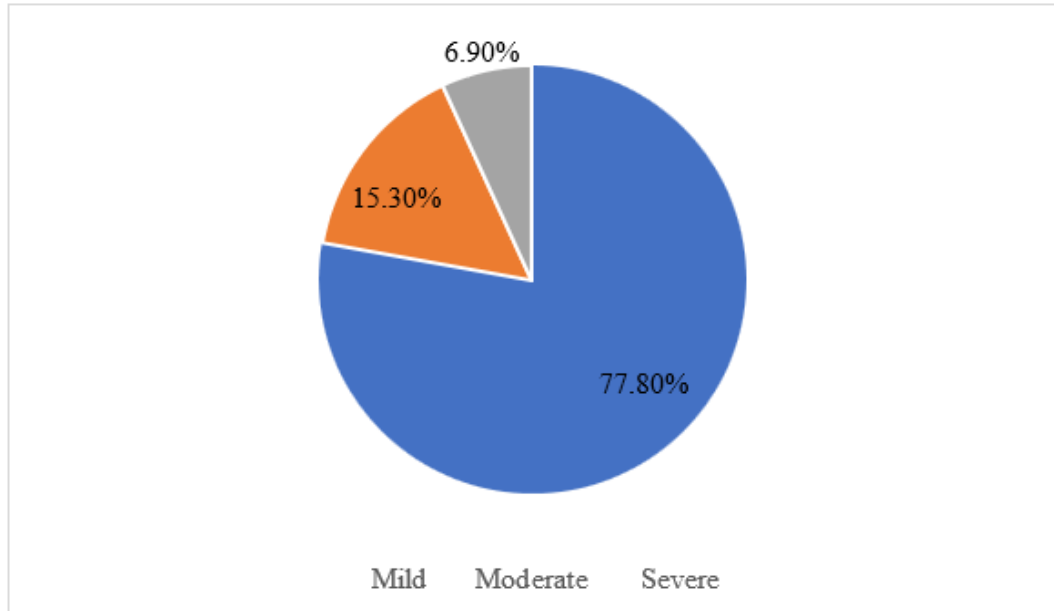


Figure 3. Percentage distribution of level of consciousness according to the Glasgow scale

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

The graph shows that most motorcycle accidents patients have mild injuries in 77.8% of cases, followed by moderate injuries with 15.3% and severe with 6.9%. As most injuries are mild, it can be said that motorcycle accidents in most cases do not compromise patient's level of consciousness. However, those severely injured would have their level of consciousness most compromised (Elsevier, n.d., p. 1).

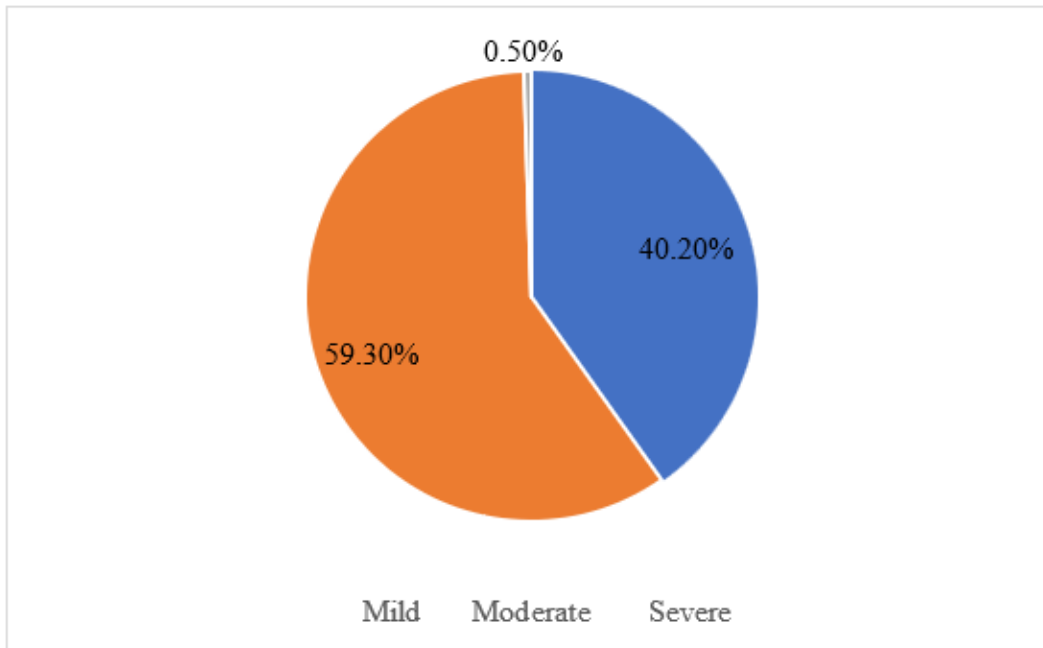


Figure 4. Percentage distribution according to the Analogue pain scale.

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

When evaluating the level of pain of motorcycle accidents patients, the majority 59.3% reported moderate pain, followed by 40.2% indicating mild pain and 0.5% with severe pain, which indicates that it must be considered the pain level as a complication when patients arrive to get treated (Vicente Herrero et al., 2018, p. 3).

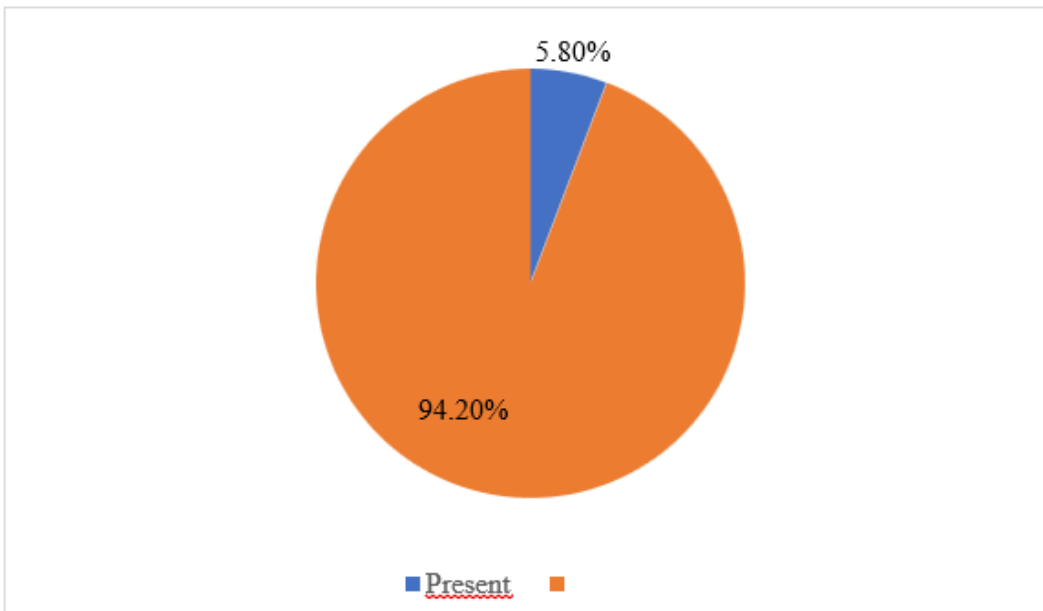


Figure 5. Percentage distribution of respiratory distress.

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

Motorcycle accident patients mostly do not present respiratory distress 94.2% while only 5.8% presented respiratory distress. Therefore, this shows that the respiratory system is rarely affected in motorcycle accidents (García Celorio, 2017, p. 38)

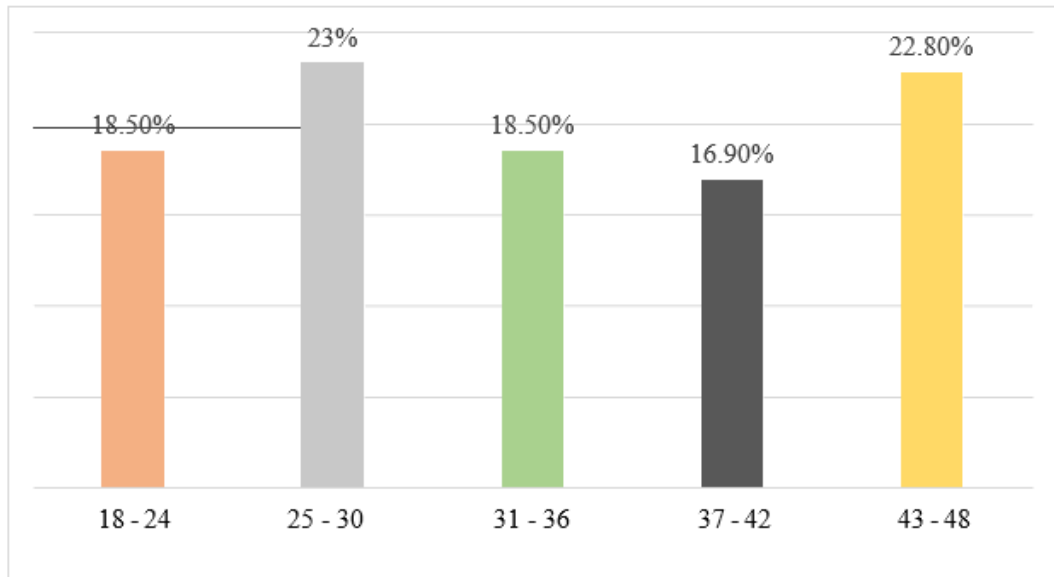


Figure 6. Percental distribution by age

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

According to the investigation, most people involved in motorcycle accidents are between 25 and 30 years old 23.3%, followed by 22.8% between 43 and 48 years old, and 18.5% between 18 and 24 years old and 31 and 36 years old. This shows that it is not the younger group of people that are the ones who are involved in most of the motorcycle accidents like it was though before. However, younger people have been related to having motorcycle accidents due to reckless driving (García Celorio, 2017, p. 38).

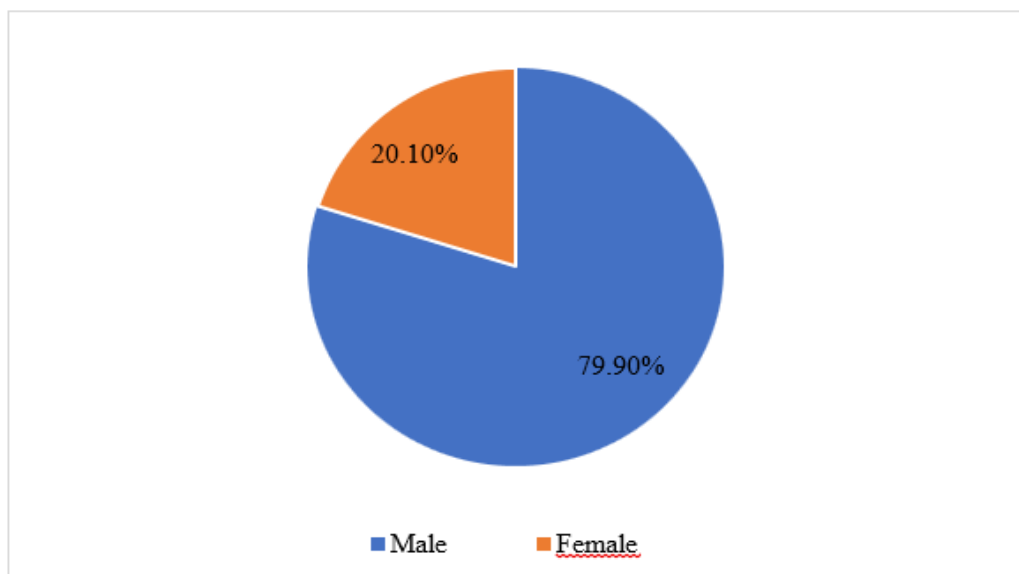


Figure 7. Percental distribution by sex

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

According to the investigation, most people involved in motorcycle accidents are men with 79.9%. And the remaining 20.1% are women. This can be because men are the ones that mostly choose to have a motorcycle as their means of transport (Cárdenas Gómez & Marcillo Pintado, 2020, p. 47).

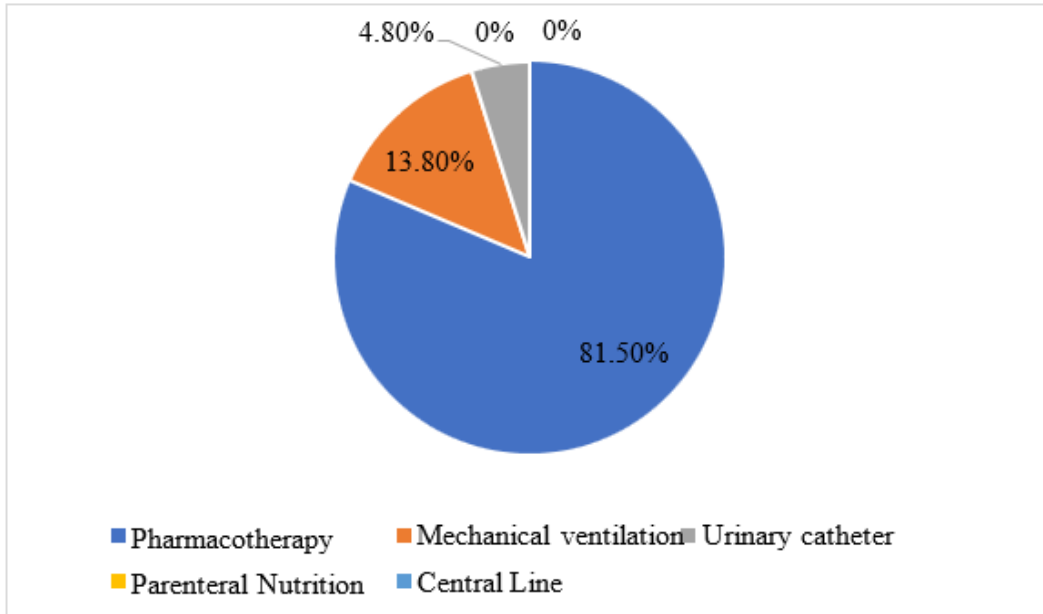


Figure 8. Percentage distribution of clinical treatment.

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

The clinical treatment most used is pharmacological treatment with 81.5%, followed by mechanical ventilation, used for the most severe cases, with 13.8%. This can be related to the fact that most motorcycle injuries are mild, so the treatment is focused on manifestations such as pain. Pharmacotherapy is one of the most effective ways to control pain (Cárdenas Gómez & Marcillo Pintado, 2020, p. 47).

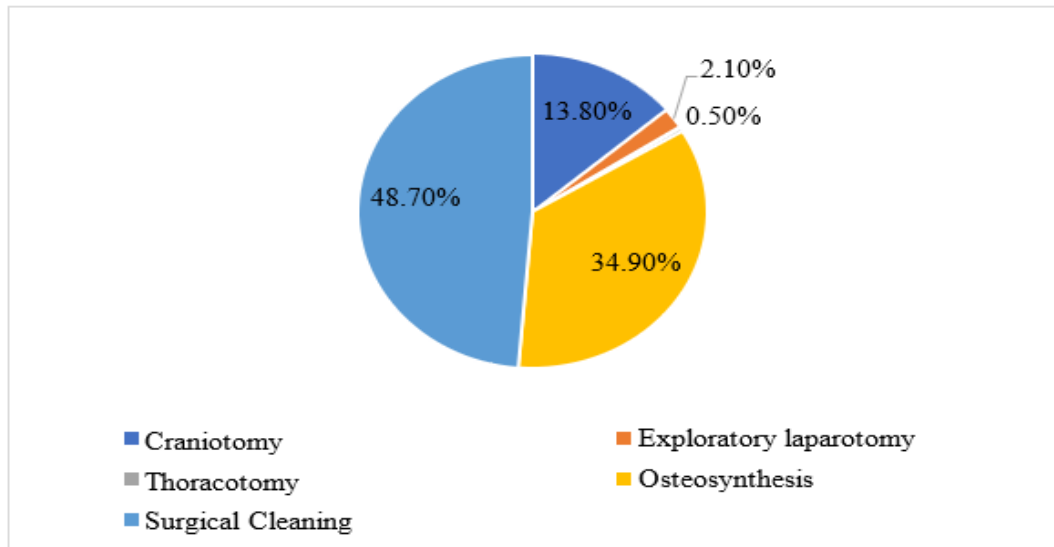


Figure 9. Percentage distribution by surgical treatment

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

According to the investigation, surgical cleaning is the most common surgical treatment used on motorcycle accidents patients with 48.7% of cases, followed by osteosynthesis 34.9% and craniotomy 13.8%. This can be related to the fact that most cases are not serious and do not need major interventions while the osteosynthesis is used in the pelvic extremities as that is usually the most affected area (Revista, 2021, p. 5).

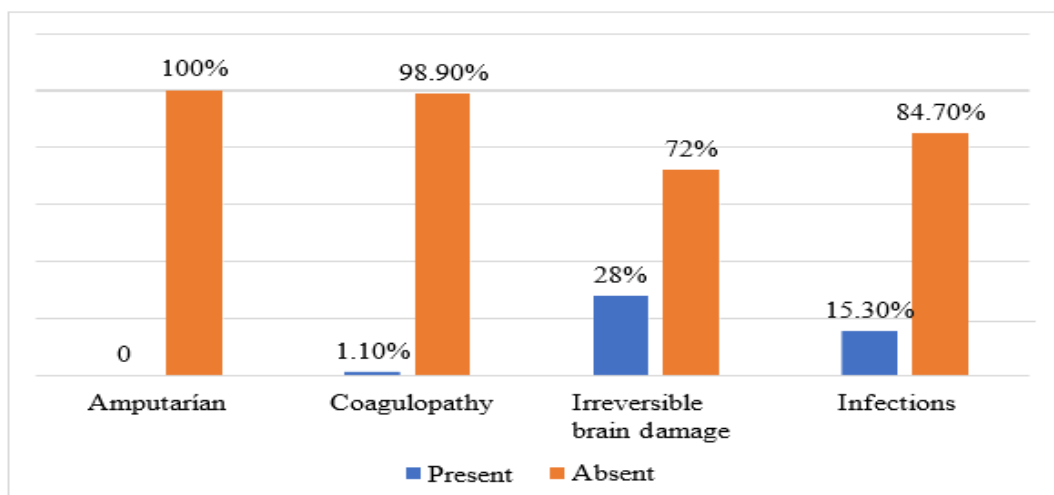


Figure 10. Percentage distribution by complications on polytraumatized motorcycle accident patients.

Source: Medical records.

Prepared by: Author.

Analysis and interpretation of results

In the investigation, there were no amputations because of motorcycle injuries, also, coagulopathy complication was shown on only 1.1% of the cases. On the other hand, irreversible brain damage occurred in 28% of patients and is the most severe complication

to treat. These patients may not be able to recover completely and become disabled for life or die. And finally, infections happen in 15.3% of cases, they are related to the open wound encountering street pathogens (Cárdenas Gómez & Marcillo Pintado, 2020, p. 47).

Discussion

According to the area of the wound, author García found that the area most affected is the cephalic region with 40% followed by the thoracic region with 26.6% and abdominal with 16.67% (García Celorio, 2017, p. 40). However, in this investigation, the area where most injuries occur as a result of a motorcycle accident is in the pelvic extremities with 39.2% of cases, followed by the skull/face with 28.6% and finally the thoracic extremities with 28.0%.

In an investigation by Cárdenas in Cuenca – Ecuador, about neurological injuries due to two-wheeled vehicles traffic accidents in 2020, it was stated that, according to the Glasgow scale, most were mild 79.6%, 13.6% moderate and 6.8% severe (Cárdenas Gómez & Marcillo Pintado, 2020, p. 47). This is consistent with our investigation where the majority of patients has mild injuries 77.8%, followed by 15.3% moderate and 6.9% severe.

Berrones did an investigation in Mexico, where the age of people with motorcycle accidents ranged between 21 and 30 years old with 27% of cases, followed by between 31 and 40 years old 18% (Berrones-Sanz, 2017, p. 5). On the other hand, Sánchez, who did an investigation in another city of Mexico, found that most accidents happened to people between 14 and 19 years of age, followed by the group of ages between 20 to 25 years old (Risk factors for morbidity and mortality, in a group of motorcyclists in the state of Oaxaca, 2020, p. 3).

The first investigation shows younger people with motorcycle accidents, it is the same as what was found in this research where the majority of the patients 23.3% are between 25 and 30 years old. On the other hand, the second article has an even younger population as the most affected, which differs from what was found in our investigation.

García in his study about the complications of polytrauma due to traffic accidents found that 33.3% suffered from respiratory distress, followed by 23.3% with coagulopathy and electrolyte disorders with 20.0% (García Celorio, 2017, p. 38). However, in our research, most of the patients, 94.2%, did not present respiratory distress, only 5.8% of them did. Likewise, when it comes to electrolyte disorders, only 3.2% had it.

Conclusions

In conclusion, according to the sociodemographic characteristics researched, males have the highest percentages of motorcycle accidents compared to females. This is because men tend to acquire and drive most this type of vehicle. On the other hand, motorcycle accidents occur most to the age group between 25 and 30 years old, therefore we can say that a relatively young population group are most at risk of motorcycle accidents as they are of productive age and also have to provide to their families. It is a big problem when they become a temporary or permanent burden to their relatives because of suffering an injury.

When it comes to clinical characteristics, pelvic extremities is the most injuries happen, followed by the skull/face. In addition, according to Gustillo scale, type II wounds were the most frequent. The areas most at risk of damage are the lower limbs and they play an important role in patient's mobility. It can imply a disability that will hinder getting work and thus contributing with the household.

In this research, according to Glasgow scale, the level of consciousness in which patients arrive after having a motorcycle accident is mostly mild, followed by moderate, and in the least of cases severe, most serious complications. This scale indicates the chance of recovery and survival of the patient.

Pharmacotherapy is the clinical treatment of choice in this research, this is because most of the injuries are minor and can be managed without surgical interventions. Hence, regarding the surgical treatment research, most patients require only the surgical cleanings since they have minor injuries, and the second surgical treatment most used is osteosynthesis because of fractures.

To conclude, when it comes to the research of complications, there were no cases of amputation. Also, coagulopathies occurred in an isolated way. On the other hand, irreversible brain damage is related to skull / face wounds, which is second on most frequent area of injury. The Glasgow scale shows the magnitude of damage that can happen in a motorcycle accident, and because it can have irreversible or fatal consequences, motorcycle accidents are of great interest to public health.

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