Epidemiology of patients treated at the Risoleta Tolentino Neves Hospital according to the type of pre-hospital care

Epidemiologia dos pacientes tratados no Hospital Risoleta Tolentino Neves de acordo com o tipo de atendimento pré-hospitalar

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ABSTRACT

The Risoleta Tolentino Neves Hospital (RTNH) is considered a trauma reference hospital in Belo Horizonte. In 2010, 102,098 patients were admitted to the Emergency Room of the RTNH and allocated in three distinct groups (G1, G2, and G3) considering the type of pre-hospital care received. The data were studied according to the ICD-10 chapters. **Objectives:** to perform an epidemiological analysis of RTNH Emergency Room in 2010 and compare epidemiological characteristics of patients transported by specialized services provided by ambulances and by other forms of transportation, such as by laymen, to implement the tele-urgent service to integrate the prehospital service with hospital medical assistance. **Material and methods:** this study is the result of an epidemiological, descriptive, individual, observational, and retrospective study. **Results:** a total of 7,191 patients were transported by ambulance (G1) (7.4%). A total of 1,603 patients were transported informally by lay people from the police (G2) (1.57%). The remaining patients were transported by laymen or self (G3) and totaled 93,304 individuals (91.38%). Trauma cases accounted for 72.22% in G1, 60.06% in G2, and 22.7% in G3. **Conclusion:** this study gathered detailed epidemiological data in the RTNH Emergency Room in 2010 and analyzed its association with the pre-hospital care received. This knowledge can be used to improve specialized pre-hospital care and pre-hospital informal transportation, and integrate the pre-hospital with hospital care. The implementation of a tele-urgent service is fundamental to improve this integration and reduce mortality in trauma.

Key words: Telemedicine; Emergency Medical Services; Critical Care; Ambulances; Air Ambulances.

RESUMO

*O Hospital Risoleta Tolentino Neves (HRTN) é considerado uma referência em trauma em Belo Horizonte. Em 2010, 102.098 pacientes foram admitidos no Pronto-Socorro do HRTN e alocados em três grupos distintos (G1, G2 e G3), considerando-se o tipo de cuidado pré-hospitalar. Os dados foram estudados de acordo com os capítulos do CID-10. **Objetivos:** realizar análise epidemiológica do Pronto-Socorro do HRTN em 2010. Comparar características epidemiológicas de pacientes transportados por serviços especializados feitos por ambulâncias e por outras formas de transporte feitas por leigos, a fim de implementar um serviço de teleurgência para a integração do serviço pré-hospitalar com a assistência médica hospitalar. **Material e métodos:** este trabalho é o resultado de um estudo epidemiológico descritivo, individual, observacional e retrospectivo. **Resultados:** pacientes transportados por ambulância (G1) foram 7.191 (7,4% do total). Os pacientes transportados informalmente por leigos da polícia (G2) foram 1.603 (1,57 % do total). Os demais pacientes transportados por leigos ou por conta*

*própria (G3) totalizaram 93.304 indivíduos (91,38%). Casos de trauma representaram 72,22% do grupo G1, 60,06% do grupo G2 e 22,7% do grupo G3. **Conclusão:** este estudo reuniu dados epidemiológicos detalhados do Pronto-Socorro do HRTN em 2010 e associou com o atendimento pré-hospitalar. O conhecimento desses dados pode ser usado para melhorar o atendimento pré-hospitalar especializado e o transporte pré-hospitalar informal, além de integrar o atendimento pré-hospitalar ao hospitalar. A implantação de um serviço de teleurgência é fundamental para melhorar essa integração e para reduzir a mortalidade no trauma.*

Palavras-chave: Telemedicina; Serviços Médicos de Emergência; Cuidados Críticos; Ambulâncias; Resgate Aéreo.

INTRODUCTION

The WHO reports that more than 100 million people worldwide are victims of trauma and injuries each year. Among them, more than five million die from violence and trauma. About 90% of the global burden of violence and trauma deaths occur in poor and developing countries.[1,2]

The HRTN is a teaching hospital funded by the National Health System. It is managed by UFMG and is a reference to trauma care for 1.5 million people in the metropolitan region of Belo Horizonte.

The study of trauma epidemiology is important to provide the necessary support for the population health.[2,3] Pre-hospital emergency medical services play an important role in any trauma care system.

Seriously injured patients are transported to the hospital by specialized or informal pre-hospital services, which means in a police car or other means of alternative transportation (carried by friends, relatives, curious people, or those who use their own means of transportation).[4]

OBJECTIVES

- to conduct an epidemiological analysis of the HRTN Emergency Room in 2010.
- to compare epidemiological characteristics of patients from the pre-hospital specialized transportation (pre-hospital emergency medical services made by paramedics in an ambulance) and other means of pre-hospital transportation (informal).
- to collect information in order to implement the tele-urgent service for the integration of pre-hospital and hospital care.

MATERIAL AND METHODS

This cross-sectional study included patients admitted to HRTN from January 1st to December 31st of 2010 and received approval from the Ethics Committee in April 2011.

Data were collected in the MV2000i computer system that manages generated information, organizes, and integrates the entire process encompassing the institutional costs and results. This system is certified by the Brazilian Society of Health Informatics (SBIS) and the Federal Council of Medicine (CFM).[5]

The patients were divided into three groups (G1, G2, and G3) considering the type of care or pre-hospital emergency care. Group 1 (G1) consisted of patients transported by specialized pre-hospital transportation performed by paramedics in an ambulance; Group 2 (G2) consisted of patients transported by non-specialized pre-hospital transportation (informal) performed by lay policemen; Group 3 (G3) consisted of patients transported by non-specialized pre-hospital transportation (informal) performed by lay people in general (friends, relatives, curious people or those using their own transportation).

Data were organized based on CID-10, which is a disease classification system according to established criteria. It is divided into 21 chapters. Chapters I to XVII relate to diseases and other morbid conditions; chapter XIX to injuries, poisoning, and certain other consequences of external causes. The remaining chapters complete the range of subject matters nowadays included in the diagnostic information.[6]

RESULTS

In 2010, 102,098 patients were admitted to the Emergency Room of HRTN. A total of 7,191 patients (7.04% of total) were in the pre-hospital specialized transportation (G1) group; 1,603 people (1.57% of total) were patients in the informal pre-hospital transportation performed by the police (G2) group; and 93,304 patients (91.38% of total) were in the G3 group of informal pre-hospital transportation performed by lay people in general (friends, relatives, curious or those who use their own transport).

Patients with diseases in the musculoskeletal system and connective tissue, allocated in chapter XIII, reached a total of 2.6% in G1, 3.62% in G2, and 7.67% in the total number of patients (Table 1).
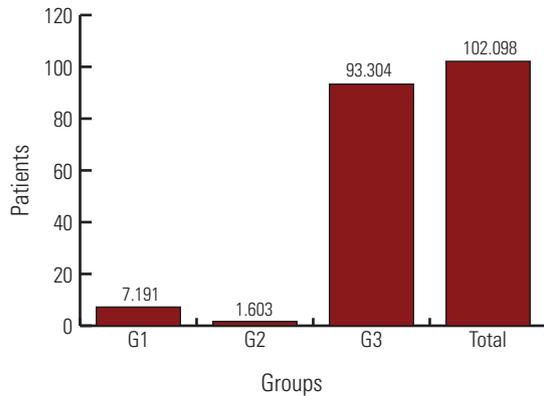
Figure 1 - Patients assisted at HRTN between January1st and 31st of 2010.

Patients allocated in chapter XV (pregnancy, childbirth, and postpartum) account for 4,422 people and were almost exclusively present in G3 (4.73%). They rarely appear in G1 and G2 (Table 1).

Patients with diseases related to chapter XVIII (symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified) and chapter XXII (Codes for special purposes) were more than 32%, distributed in G2 and G3 (G1 presented only 7%). These two chapters cover diseases and conditions of uncertain diagnosis (Table 1).

Patients with conditions related to chapters XIX and XX respectively, lesions, poisoning, and certain other consequences of external causes and external causes of morbidity and mortality were allocated in all groups. Considering only trauma, they were more than 22% in all groups. The percentages were higher in G1 (72.22%) and G2 (60.06%) (Table 1).

Patients with diseases related to chapter XXI (factors influencing health status and contact with health servic-es) were distributed high frequency in G3 (10.46%). They were less than 1% in G1 and G2 (Table 1). This chapter is intended for the classification of data explaining the reason for the contact with health services by people who were not currently ill or circumstances in which the patient is receiving care at that particular time or otherwise having some influence on the person's health.[6]

DISCUSSION

According to the WHO, trauma injuries cause 5.8 million deaths a year, more than 90% in low and middle-income countries. It also causes a significant amount of disability and economic loss. Much of this burden could be reduced through improvements in trauma care. In order to improve emergency care, it is necessary to integrate the pre-hospital emergency care and hospital systems.

The data collected in this study showed that patients treated at HRTN with conditions related to chapters XIX and XX (trauma) were close to 22% of the total. These patients were allocated in G1 (72.22%) and G2 (60.06%). These data confirm HRTN as a reference for trauma in Belo Horizonte receiving multiple trauma patients primarily through specialized pre-hospital transportation performed by paramedics in an ambulance (G1) and informal pre-hospital transportation performed by lay police officers (G2).

The informal pre-hospital transportation performed by lay police officers is not an official transportation form for trauma patients. However, it is a useful informal service when it takes a long time for the arrival of specialized transportation to the trauma scene, or there are difficulties to reach the scene because of violence.

Table 1 - Patients assisted at HRTN between January 1st and 31st of 2010 according to CID chapters and type of pre-hospital care (G1, G2, and G3)

Disease / Condition / CID	G1	G2	G3	Total
The diseases of the circulatory system	493 (6.86%)	11 (0.69%)	2.706 (2.90%)	3.210 (3.14 %)
Diseases of the musculoskeletal system and connective tissue	187 (2.60 %)	58 (3.62%)	7.587 (8.13%)	7.832 (7.67 %)
Pregnancy, childbirth, and puerperium	42 (0.58%)	1 (0.06%)	4.422 (4.73 %)	4.465 (4.37%)
Symptoms, signs and abnormal clinical and laboratory findings not classified somewhere else	381 (5.3%)	41 (2.56%)	6.269 (6.72%)	6.691 (6.55%)
Factors influencing health status and contact with health services	55 (0.76%)	8 (0.50%)	9.762 (10.46%)	9.825 (9.62%)
Codes for special purposes	153 (2.13%)	475 (29.6%)	33.010 (35.38%)	33.638 (32.95%)
External causes — IXX and XX	5.196 (72.22%)	962 (60.06%)	21.196 (22.71%)	27.354 (26.79%)
Other causes (other chapters in CID - 10 not mentioned in this table)	684 (9.55%)	47 (2.91%)	8.352 (8.95%)	9.083 (8.91%)
Patients per group	7.191 (100 %)	1.603 (100 %)	93.304 (100 %)	102.098 (100%)

Usually, patients are in critical situations, such as victims of disasters or urban violence (victims of knives or fire arms). Some police officers receive basic training during police training or some other time in their profession. Despite their readiness to participate, the police officers are not well prepared to do this work, and their vehicles are far from the best option for the transportation of seriously injured patients.

In addition, this study showed that the informal pre-hospital transportation performed by lay people in general (G3) was the most common alternative (91.38%) for patients who arrived at HRTN. In general, patients from the non-specialized pre-hospital transportation represent the purest form of "scoop and run".[4]

In order to reduce deaths from trauma and violence and minimize the weight of "trauma disease", municipalities must be equipped with the best specialized pre-hospital transportation as possible. Unfortunately, this is not the reality, at least in developing countries. Non-specialized pre-hospital transportation services performed by the police (G2) are a means of unconventional transportation, however, allowing great aid and actually getting to trauma victims before the specialized transportation (ambulances), as demonstrated in this study.

Research conducted in Los Angeles, the USA involving 103 patients concluded that severely injured patients arrived at the hospital informally transported faster than their equivalents carried by ambulances in the urban setting of Los Angeles. According to this study, the pre-hospital care should prioritize the fast transportation of cases of penetrating trauma victims who are breathing spontaneously and moving their legs[7]. It is known that the mortality rate is also influenced by the severity of the injury and patients' characteristics in trauma cases.[8]

A Canadian study on emergency medical service concluded that, after adjusting for injury severity and patient's age, the main factors to decrease mortality rate were treatment at a tertiary center, reduced pre-hospital time, and direct transportation from the scene to tertiary centers. The integration of trauma regionalized services in a system also reduces mortality. These results showed that tertiary trauma centers and reduction in pre-hospital care time are the essential components of an efficient trauma service system.[9]

CONCLUSION

This epidemiological study presents detailed data on the emergency room of HRTN in 2010, correlat-ing hospital and pre-hospital care. These data can be used to program interventions in the emergency medical system in three different ways. First, by promoting the integration of the emergency medical system between pre-hospital and hospital care. Second, by preparing HRTN to assist the most common emergencies. Third, by using the work as the baseline to assess the trauma care trend at HRTN in the coming years. The use of CID-10 has allowed systematic data analysis comparing the trauma epidemiology at HRTN to different countries or areas worldwide.[6]

The MV2000i computer system is an important tool to manage the information generated in all areas of the hospital, including epidemiological data. The use of this system allowed improving management through trauma epidemiology data analysis and research within a teaching hospital.[5]

The implementation of the tele-urgent system can increase the integration between pre-hospital emergency care and hospital emergency care. This integration into a regionalized system is an important tool to reduce trauma mortality.[9] The HRTN is about to start a tele-urgent project, which is facilitated by a system of electronic medical records and other features such as being a teaching hospital and a reference for emergency care, especially for trauma.

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