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Treatment of Cutaneous Traumatic Wounds in the Emergency Room: What Makes Difference?

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Abstract

Objective: To define the epidemiological characteristics of patients during follow-up after initial care of a traumatic skin wound in the emergency room and to correlate this with literature data.

Method: Across sectional prospective observational study. Patients with traumatic wounds treated in the emergency room were given 2 questionnaires: a questionnaire regarding factors that influence the healing process and a second questionnaire, given between 7 and 10 days later, about the care of the site, degree of healing and signs of infection. Results: From the initial sample of 47 patients only 25 patients completed and returned to the second evaluation. Half of patients had not completed high school. Most common wounds were related to sharp objects (68%). One in every three injuries involved the hand; and of these, 92% were work related. The scalp was affected in 23% and the face in 21% of cases. Twenty percent of patients had returned with signs of infection, compared to the literature showing a rate of 3.5%. Eighty percent of patients with wound infection denied any related health conditions.

Conclusion: This population showed a low level of education, which may be a factor in poor understanding and care of the wound. The most common location of the wound was the head (scalp and face) followed by the upper extremities (especially hands). Considering the epidemiology and mechanisms of trauma frequently experienced in our environment, prevention can be cost-effective and decrease morbidity. Follow up is a potential source of bias since patients may be motivated to attend this service based on how they perceive abnormal wound healing. This work shows the importance of many factors related to traumatic wound care but it is essential that the investigation be expanded.

Keywords: Traumatic wound; Suture, Infection; Work related accident

Introduction

Acute wounds are defined as a change in tissue integrity in any part of the body. They can be characterized by size, depth and anatomical structures involved [1]. Penetrating and blunt Trauma can produce injury to extensive anatomical areas, not only directly, but also by changing the adjacent microcirculation. In the environment of the emergency room (ER), a rapid management of wounds, including proper surgical technique and efficient debridement, infection control and irrigation, is the key to success of wounds treatment [1-6].

Management of acute traumatic wounds must take into account aspects related to the patient and to the wound characteristics. However, general measures should always include a good debridement and removal of foreign bodies, and proper approximation of wound edges [5,7-12].

In addition, each patient with traumatic wound may have multiple risk factors for poor healing, including chronic diseases and life style factors that can change its phases. Obesity, smoking, immunosuppression, atherosclerosis, diabetes, malnutrition, alcoholism and anemia among such factors [6]. For these reasons, the complete recovery of anatomical, functional and aesthetic of the patient depends on the interaction of several factors, not only related to treatment, but also the systemic status of the patient. Most of the decisions made in the initial care in relation to the preparation of the wound and its closure have wide variation, even considering the same service. This leads to little evidence-based information, due to the lack of comparison parameters [8]. Adding to this, there is a wide range of choices of products and medicinal products that may be used. Wounds can be classified as properly healed, healed or minimally acceptably healed, based on various degrees of restoration of normal anatomy, function, structure and appearance [7].

Lacerations and other wounds are the third most commonly found problem in emergency departments, accounting for 8% of the 95 million medical assistance of this type of service in the United States [2]. The initial care provided to patients with traumatic wound in emergency room, is a major determinant of patient outcomes, including aesthetic and functional parameters related to wound. However, monitoring the patient in most cases is not performed in this environment of care

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standard. This characteristic affect the assessment of conduct taken as data on the outcome of the wound are lost.

Hospital do Trabalhador is a referral center for trauma, where the vast majority of wounds treated are classified as contaminated or infected. Thus, it is clear the relevance of the above conditions, since there is a directly proportional relationship between the technique employed rigorously (cleaning, exploration, debridement, dressing and suture) and the result obtained. It is the aim of this study to set out the characteristics displayed by patients in recurrence after initial treatment of traumatic skin wounds in ER. Moreover, to correlate between local data with the literature on determinants for sutures.

Methods

An observational prospective descriptive study. Two questionnaires were applied for data collection. The first part when patients were admitted in the ER with an acute cutaneous traumatic wound during its suturing process, and a second part when patients returned in clinics for follow up.

The first questionnaire (ER part), listed factors that influenced the healing process and epidemiological issues. Also, wound type, location, extent, depth, loss of substance, the presence of foreign bodies, neurovascular status and fracture associated to the injury site, were considered.

Thus, the observer student used a proper check-list to verify suture procedure conditions, such as wound cleansing process, prescribed analgesia. There were no interventions by the observer student to the undergoing procedure. Also, students who performed the suture and that were under observation did not know they were being evaluated.

The second part (follow up clinic questionnaire), was applied between 7 to 10 day safter closure of the wound. This check-list included degrees of healing, dehiscence, signs of inflammation and / or infection. Patients were also asked about dressing care (frequency, location, material used) and about the use of prescribed medications (effectiveness).

The first questionnaire was applied by different volunteer students. All follow-up clinic evaluations were maiden by the same student under the supervision of two professors. From December 2011 to February 2012, both questionnaires were applied in random days, depending on students availability. 47 patients answered the first questionnaires, of whom only 25 returned to follow-up clinics (about 53%). Among the incoming calls from the emergency room, 44% were the result of accidents victims. Regarding the level of education, 57.4%of patients had not completed high school (Figure 1). The most common type of wounds were Cuts (68%), followed by Lacerations (21%), and finally the Incised (11%). Almost one third of injuries were to the hands being 92% from work-related accident. The scalp was the second most common site of injuries (23%), followed by face (21%). There were 12% of hits on foot, and only 2% to the abdomen (Figure 2). Only 6% of the patients showed impaired peripheral perfusion on admission. In such cases, injuries were 4, 6 and 8 inches length with 1.5 inches in maximum depth. Also, 12% of patients had change of the peripheral staining (pallor/cyanosis) and 6% of flushing.

The most common mechanism of injury observed was hit by object (38%), followed by fall from the same high (14.8%). Crushing was observed in 1 of 10 cases. Other mechanisms, less frequent, were falling from motorcycle, stab wounds and fall from the high, each of these

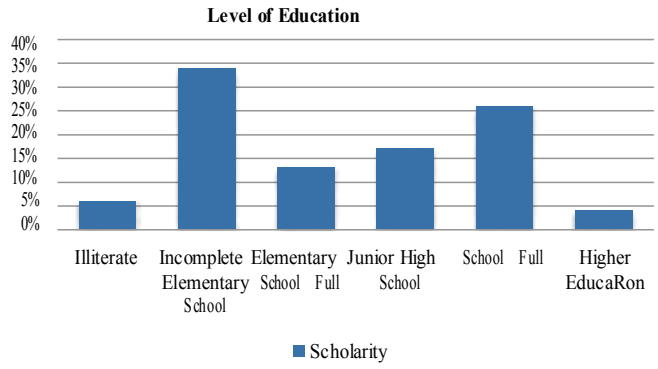

Figure 1: Level of Education.

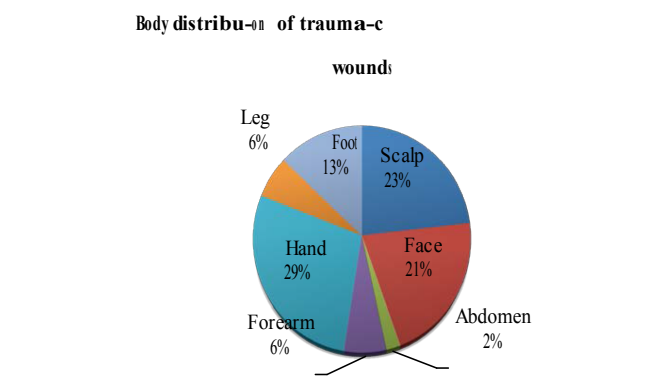

Figure 2: Body distribution of traumatic wounds.

Loss of Substance	
Extensive	9%
Minimum	40%
Non-existent	51%
Foreign Bodies	
Yes	2%
No	98%
Active Bleeding	
Important	9%
Smallamount	62%
Absent	30%
Temperature	
Normal	94%
Decreased	4%
Increased	2%
Colour	
Normal	81%
Pallor/cyanosis	13%
Flushing	6%
Sensibility	
Preserved	94%
Disminished/Changed	4%
Absent	2%

Table 1: Characteristics of Wounds.

with an incidence of 8%. Aggression accounted for 4% of cases, the same amount found for dog bites. Finally, there were only 2% of cases of pedestrian hit by a car (Table 1).

One of every five patients who returned to clinics showed signs of infection and or inflammation. From these, 80% were work-related accidents. 80% of cases presented some purulent secretion, collections or abscesses, 40% showed necrosis, 40% presented suture dehiscence.

The minimum selapsed time between trauma and suture were two hours and thirty minutes and a maximum of 3 hours. The less average injury length was 1.5 cm. All patients under went dressing at home, but only 20% changed dressing 2 times a day.

80% of patients who developed wound infection denied related health conditions (diabetes mellitus, Peripheral Arterial Disease, HIV, obesity, smoking and edema not caused by trauma). Despite antibiotic prescription, 40% of patients developed pus and abscesses. In 60% of wound infection, simple separated stitches were applied, and in the remaining 40%, Donatti stitches were maiden.

17% of all patients sutured did not have proper conditions of procedure preparation. Although 1 of 5 people who returned showed signs of inflammation and / or infection, suture technique malpractice was observed in 27.6% of the total sample.

Discussion

Many factors contribute to the satisfactory healing of a wound. Factors that cannot be controlled during care in the emergency room are mostly the genetic, comorbidities and the wound characteristics. However, bleeding control, inspection, operation, cleansing, debridement, a good technique of approximation of edges, the correct choice of materials, healing, infection control, anesthesia and analgesia and effective guidelines for care at home may be affected by the primary care in the emergency room. A good understanding of all these factors is a key factor to avoid Complications [9,13].

The level of education is a factor to be considered at the time of the orientation regarding homecare. The population of this study proved to have relatively low education, which may be a determining factor for poor understanding of the guidelines provided. Regarding body distribution of wounds, the most common were to the head (scalp over face), followed by the upper body, what is the same pattern of literature, which shows up to 50% of traumatic wounds occurring in the head, followed by 39%upper body, especially hand [2]. In this study, injuries to the hands accounted for 28% of injuries itself. This is probably associated with higher number of work-related accidents in this study, what suggests the need for prevention measures in companies to be cost- effective to decrease morbidity. Wounds were mostly prepared with water, saline and polyvinyl-pyrrolidone, following the trend on the literature. Also, skin sutures were maiden with nylon [10,11].

The use of antibiotics was done mainly for two indications: Dog bites and significant aesthetic result (localization on face). The only risk factor for bad wound healing prevalent in this sample was smoking. Twenty percent of patients who returned to the clinics showed some signs of wound infection. Literature shows a 3.5% rate of infection in traumatic wounds in the emergency room. 2 The limitations of the present study were the small number of patients and the low return to clinics rate.

Conclusion

This population showed a low level of education, which may be a factor in poor understanding and care of wound. The most common location of the wound was the head (combination of scalp and face) followed by the upper extremities (especially the hand). Considering the epidemiology and mechanisms of trauma frequently experienced in our environment, prevention can be cost-effective and decrease morbidity. Twenty percent of patients who returned to the follow up service showed some signs of wound infection. The follow up is a potential source of bias as patients may be motivated to attend this service based on how they perceive abnormal wound healing. This study shows the importance of many factors related to traumatic wound care but it is essential that the investigation to be expanded.

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