



Care for patients with accidental tetanus through fireworks: experience report

Assistência ao paciente com tétano acidental por meio de fogos de artifício: relato de experiência

Asistencia a pacientes con tétanos accidental a través de fuegos artificiales: un informe de experiencia

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ABSTRACT

Objective: To report the experience of a care for a person with clinical picture of accidental tetanus, victim of fireworks. **Method:** It is a descriptive study, experience report type, referring to the experience of a care performed by nursing students in June 2019, in an emergency unit at a regional public hospital in a city in the inland of state of Bahia, Brazil. **Results:** Victims of burns by fireworks need nursing actions that promote measures to prevent accidental tetanus. These activities can be a detailed data collection, such as observation of vaccination history and wound bed care. **Conclusion:** From the experience, it was possible to expand the knowledge of nursing students through reflections on the immediate measures related to care with accidental tetanus.

DESCRIPTORS

Tetanus; Emergencies; Burns; Health Education.

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INTRODUCTION

Accidental tetanus is a serious bacterial, vaccine-preventable, non-transmissible infection, which affects people in any age group and is more frequent in underdeveloped or developing countries.¹

Epidemiological data bring that tetanus is a rare disease in European and North American countries, mainly because of social/educational and vaccination development. However, in Brazil, increased rates in occurrence indexes have been observed. Between the years of 2013 to 2017, 1,313 accidental tetanus cases were recorded in the country: 188 in North Region, 382 in Northeast, 307 in Southeast, 266 in South and 170 in Center-West Region.²

The disease mortality is high, every 100 people who get sick, about 30 die, so this disease means an adversity to collective health of the country.³ It is noteworthy that patients treated in intensive care unit present an approximately four-fold reduction in mortality when compared to patients treated in the ward.⁴

Agricultural and construction workers are the main examples of Brazilians affected by accidental tetanus in which, from the 1990s, increase in cases in cities is observed, not only in rural regions.¹

This disease is caused by the action of exotoxins produced by *Clostridium tetani*, which induces a hyperexcitability state of central nervous system. This microorganism is found in nature, and its transmission, generally, occurs when there is a lesion in skin or mucous membrane in which the contamination occurs.⁵

Among the possible accidental tetanus causes, it is worth mentioning the cases caused by perforation, in which the lower limbs (85%) are the most affected, laceration (14%), excoriations (12%) and other causes such as burns.⁵

Accidental tetanus is a mandatory notifiable disease contemplated in Consolidation Ordinance No. 4, from September 28, 2017, in which the need for the following are reinforced: to know the

epidemiological profile of the disease; to take control measures; to identify and characterize the risk population for vaccination recommendation; to assess the impact of control measures; to promote continuing health education, encouraging the use of protective equipment and objects in order to prevent the occurrence of injuries or lesions.³

In northeastern Brazil, two catholic saints are culturally celebrated in June, Saint John and Saint Peter, and these celebrations are presented with fireworks, causing burn accidents. Data from Ministry of Health show that the increase of burns caused by accidents with fireworks can triplicate because of June festivals.⁶ And, thus, impacts on population health are caused, since it is possible that the contamination by *C. tetani* occurs in these injuries.

Nursing has an important role in the tetanus control since it is responsible for the vaccination control of population and is presented in initial emergency care in curative actions and wound assessment. It is worth noting that the vaccination is the main measure to prevent tetanus. Furthermore, it significantly contributes to reducing the mortality rate, and the pentavalent vaccine is available for this control in basic health units in the current Vaccination Schedule.⁵

The performance of this study is justified by the need for health professionals to pay attention to control and care measures in tetanus situations in initial emergency care in order to promote an excellent care for trauma and burn victims.

In this context, the present study aims to report the experience of care for a person with clinical picture of accidental tetanus, victim of fireworks, in an emergency unit.

METHOD

It is a qualitative study of experience report type. This study concerns an experience of care for an adult patient in the period of June 2019 in the emergency department at a general public hospital in a city in the inland of state of Bahia, Brazil. The care

occurred during the curricular practices of senior students of the Bachelor of Nursing course at a state public university. For this purpose, the participant observation of care for individual with accidental tetanus by students was considered as data collection technique.

The participant observation is an information gathering technique in which the researcher observes the social situation and maintains a direct relationship with his interlocutors in their cultural setting, mainly for the purpose of understanding the context, interfering and being personally modified.⁷ It is, therefore, understood that the students presented themselves in this model, since they remained in the internship in the department for three months, from Monday to Friday in the morning shift, and, also, by acting on the admission of this patient, assisting the nursing staff in planning and care in primary care. Thus, reflection could be made regarding the understanding in this situation experienced and, furthermore, in the care for other patients victimized by burns at the hospital.

The data analysis provided understanding of synthesis of the description of experience, since it was performed from the perspective of safe care for patient exposed to *Clostridium tetani*, not only as an emergency care view, but also as a collective health issue, in a constructive critical view of the immunological prevention problem.

The motivation for description of the problems was raised from the needs to improve the knowledge regarding this subject. Since tetanus is a pathology that poses risks for population health, the knowledge about this disease is essential to a qualified initial care.

The main clinical findings resulting from the said condition and the discussions in this work were found through searches in online platforms such as, for example, the journal portal of Coordination for the Improvement of Higher Education Personnel.

This study did not present the need to be evaluated by Research and Ethics Committee since it

is an experience and do not present subject nor setting identification and hurt no ethical precepts of Resolution of the Brazilian National Health Council No. 466, from December 12, 2012.⁸

RESULTS AND DISCUSSION

Bacillus Clostridium tetani in the human body has different ways to enter through lesions, in environment, it can be present in soil, bushes, dirty waters and feces.¹ The transmission, generally, occurs by contamination of a skin or mucous membrane wound with the bacillus spores. In this sense, it is essential that all patients entering an urgent and emergency service or any other health unit with some type of injury undergo an investigation by staff, respecting his vaccination history, in addition to performance of necessary measures for tetanus prophylaxis.^{1,9}

These measures do not differ when it comes to burn patients, as it is the case of victims of accidents with fireworks. According to Brazilian Ministry of Health, burns are considered injuries with high risk for tetanus. Thus, the primary measures taken by health staff are essential to a favorable outcome of the picture of a burn patient.¹⁰⁻¹¹ In this perspective, the nurse professional actuation permeates in a fast and accurate approach in order to mitigate possible lesions and aggravations.¹¹⁻¹²

The possibility of experiencing the care for this tetanus victim allowed the identification of the common signs of this pathology. The victim, in question, had injury in the left lower limb after the accident with firework and the following classic symptoms: difficulty in opening mouth (trismus) and wandering, neck stiffness, paravertebral stiffness (opisthotonos), respiratory failure because of hypertonia of thoracic muscles, contraction of the glottis and spastic crises,¹ which made it evolve, in this patient, into an emergency tracheostomy, due to the difficulty of intubation by muscle stiffness.

In initial care for a burn patient, a careful evaluation of the injury is made as well as its length,

tissue impairment or other affected organs; the detection of the causative agent and determination of severity of the victim are also made. The interruption of the burning process, the removal of clothes and adornments and the maintenance of a large peripheral access contribute to a good clinical evolution of the patient.¹³

In this experienced care, a case of a young adult who got involved in an accident using firework. It quickly exploded after being lit, so it fell on the earth soil and then caused a burn in the left ankle region of the person with its sparks. The size of the lesion was what drew attention, as it was small (about 2×2 cm), and in the care for the wound it had phlogistic and infection signs with presence of purulent secretion. The presence of infection establishes favorable condition for bacillus development.¹ An article published in 2012 describes a case of a student in Sri Lanka with a small lesion in the left orbit that developed a picture of tetanus, in this situation the victim had an infraorbital abscess and orbital cellulitis.¹⁴ With this work, it is reinforced how favorable infection is in tetanus cases.

Thus, the experience reaffirms that the care for tetanus prevention should be performed independently of lesion size and performed in any situation that may present the bacilli. Moreover, the nursing staff should be attentive to the performance of a good accident data survey, since it is about a fundamental step so that the conducts be properly performed in planning and implementation of nursing process.

The injuries from fireworks may contain soil particles or other raw materials that favor the bacillus development, and it is important that in the primary care for this victim the nurse searches for the vaccination history needed to initiate the anti-tetanus prophylaxis.^{3,10-12} Another fundamental point is the initial care with lesion, in which it is recommended the wash with saline or running water and soap, the debridement to remove foreign bodies and devitalized tissues and finally, the use of

hydrogen peroxide on the wound bed.¹⁰⁻¹¹ In this experience, it was observed that, by collecting data from patient's family member, there was a previous care at a hospital unit, similar to the scenario of this report. The first care was at a health unit and, in both institutions, there was no use of hydrogen peroxide in the care for wound cleaning, demonstrating the importance of use of this antiseptic on injuries that involve a possible contamination by *C. tetani*.

The good prognosis of patient infected by the bacillus, cause of tetanus disease, is directly related to an early diagnosis of signals and symptoms from the clinical picture of the disease and to measures to restrain the bacillus, in this context, the emergency services staffs must be prepared to recognize and immediately start of the first interventions in order to reduce the disease mortality.^{3,15-16}

Thus, the use of protocols by health staffs for early identification and adoption of effective interventions is essential to a good clinical outcome, as is the case of TSS (Tetanus Severity Score) protocol created in the United Kingdom that points out the tetanus severity, and with these results, patients can be referred to a qualified care center.¹⁷

As these protocols and clinical management, the Systematization of Nursing Care (SNC) is an indispensable tool for an individualized and qualified care for the individuals with suspected or proven tetanus. Nevertheless, this tool is often neglected in routine of emergency services, fragmenting the care provided to the patient.

Despite the importance in patient care in emergency services, the routine vaccination is still the most effective way to prevent tetanus. The vaccination recommended by Brazilian Ministry of Health is three doses administered in the first year of life with booster doses at 15 months and 4 years of age.³ From this age, a booster dose is given every ten years after the last dose administered. Studies confirm that most victims of accidental tetanus were men and did not received vaccination against

tetanus, had incomplete vaccination schedule or did not remember their vaccination history.^{3,16} This factor is worrying since the vaccination costs are minimum when compared to hospitalizations secondary to the disease in addition to its high mortality.^{3,17}

Another factor that highlights this experience report is the fact of this individual already has had contact with anti-tetanus vaccine, but the next booster dose was delayed. This demonstrates the need to perform actions of active search not only in people who have no vaccination or have incomplete vaccination schedule, but also in the individual who did not received booster dose in the period determined by protocol. It should be stressed that this nursing action, searching for those incomplete anti-tetanus vaccination schedules, can be a measure to be performed especially in the state of Bahia in the first semester, prior to typical June festivals that mainly occur in rural areas. This action can be justified, since data from 2016 demonstrate that in Brazil the Northeast is the region that presented the most cases, and Bahia was the state most affected by this preventable disease.³

A low vaccination coverage has been observed mainly in adults and with even greater numbers among men who do not actively participate of campaigns and programs performed in the primary care due to attitudes, beliefs, lack of confidence and knowledge of the importance.¹⁴ Another factor that justifies the absence of adults is campaigns focused mostly on neonatal tetanus that immunize a large portion of women of childbearing age and neglect males.^{3,16} This gender issue is reinforced in this report as the patient was male.

Another issue to be raised is related to the decreased vaccination coverage in Brazil. In the 1990s, there was a good adherence; however, from 2016, the coverages decreased.¹⁸ A decreased vaccination is observed, influenced by various factors such as the decay of the Unified Health System, anti-vaccination movements in the country through

incorrect information across the internet and social and cultural aspects that influence vaccine acceptance.¹⁹

In this sense, nurse plays a fundamental role in anti-tetanus vaccination in this population that becomes vulnerable to vaccine-preventable diseases. The adoption of strategies that facilitate access to vaccination centers, health education and active search are important factors to increase the vaccination coverage especially among adult males.²⁰

A study performed in the Northeast region of Brazil found a greater number of burns from fireworks in June and July.²¹ This is explained by the tradition of the region in holding June festivals that increase the use of fireworks. It is often done without protection and in inappropriate locations, favoring the occurrence of lesions and even accidental tetanus, as the example of the case studied here.

In this perspective, it is realized how important nursing professional preparation is, of primary, secondary or tertiary care, to care for such victims. Education actions that show professionals the importance of data collection and proper record of data collected are essential as well as the first care to be taken for burn victims, potential outbreaks for tetanus disease.^{3,22} In the emergency environment, presenting a nursing staff attentive to both care and anti-tetanus vaccination schedule prevents the disease occurrence and offers greater protection to the population, since the emergency is the most sought-after department in accident situations.

Considering that, it is worth mentioning the importance of nursing process with SNC application to identify the main nursing diagnoses and thus, perform interventions directed at the problem faced.²³ It is noted that this is a relevant tool for nurse work practice, reflecting the quality of care for tetanus patient, aiming at a qualified, humanized care and enabling rapid rehabilitation.

To elaborate SNC, the following were used: tools for the purpose of making the history, diagnosis, planning, implementation of nursing interventions

and the evaluation of results reached.²⁴ During the mandatory practices of university course, performed in the emergency department, ways to obtain subsidies for a good filling in of nursing history with the patient and his family through anamnesis were carefully discussed. In this case, it was necessary to investigate what generated the burn, it was found that a firework caused the lesion in a rural setting, and lastly, subsidies to understand the development of bacillus were provided.

In this manner, the following arise: the need for academies to correlate epidemiologic issues with nursing process performing specific clinical investigations in units that attend the rural people more, as in this report. An American article that describes the case of tetanus in a 28-year-old female rural resident highlights that in agricultural areas, many adults can harbor tetanus and carry the bacterium to skin surfaces, and the nurse, in these places, must recognize tetanus clinical signals and symptoms to implement actions in diagnosis and, also, obtain information about the immunization for prevention and treatment understanding that data on vaccines are often not reliable.²⁵

By obtaining information about the patient's vaccination schedule, according to the case studied, it can be noted that there was an irregular vaccination history, that increased the chance of having the disease. The main objective by propagating vaccination actions is to reach a reduce in disease incidence through administration of appropriate vaccines in that population.

Thus, the study demonstrates the need for tetanus prevention, emphasizing that the care should be performed beyond the basic health units, as well as in the emergency department, including:

immunization, health education, diagnosis and early treatment, in addition to other actions related to other departments such as the mandatory notification and active search of new cases.

CONCLUSION

From this experience, it was possible to expand the knowledge of nursing students related to care with accidental tetanus. It was understood that the nursing in the primary care, as well as in the emergency, must pay attention to tetanus prophylaxis in patients who are victims of firework injuries. In the primary care scenario, the nursing staff must pay attention to obtaining information about prophylaxis and administration of anti-tetanus serum as well as for wound care. Demonstrating, in this way, that the poorly conducted treatment and guidelines can be life-threatening to the individual.

Thus, it is necessary to inform the population regarding the search for health institutions in occurrence of wounds, burns or trauma suspected of containing this exotoxin, directing them to an earlier diagnosis and more effective treatment.

This work presents a limitation by being a local study of a single experience, it cannot be, therefore, generalized. Nevertheless, we emphasize that local studies allow professionals of other scenarios to make reflections possible, enabling them to observe similarities, glimpse the discussions contained in this screen study and transfer to their work environments.

RESUMO

Objetivo: Relatar a vivência de atendimento a uma pessoa com quadro clínico de tétano acidental, vítima de fogos de artifício. **Método:** Trata-se de um estudo descritivo, do tipo relato de experiência, referente à vivência de um atendimento realizado por acadêmicas de enfermagem no mês de junho de 2019, em uma unidade de emergência de um hospital público regional em uma cidade no interior do estado da Bahia, Brasil. **Resultados:** Vítimas de queimaduras por fogos de artifício necessitam de ações de enfermagem que promovam medidas de prevenção ao tétano acidental. Essas atividades podem ser uma minuciosa coleta de dados, como observação de histórico vacinal e cuidados com leito da ferida. **Conclusão:** A partir da experiência, foi possível ampliar o conhecimento das acadêmicas de enfermagem por meio de reflexões sobre as medidas imediatas em relação aos cuidados com o tétano acidental.

DESCRITORES

Tétano; Emergências; Queimaduras; Educação em Saúde.

RESUMEN

Objetivo: Informar la experiencia de asistir a una persona con un cuadro clínico de tétanos accidental que fue víctima de fuegos artificiales. **Método:** este es un estudio descriptivo, un tipo de informe de experiencia, sobre la experiencia de un servicio realizado por estudiantes de enfermería en el mes de junio de 2019, en una unidad de emergencia de un hospital público regional en una ciudad del interior del estado de Bahía, Brasil. **Resultados:** Las víctimas de quemaduras por fuegos artificiales necesitan acciones de enfermería que promuevan medidas para prevenir el tétanos accidental. Estas actividades pueden ser de una recopilación exhaustiva de datos, como la observación del historial de vacunación y el cuidado del lecho de la herida. **Conclusión:** por experiencia, fue posible ampliar el conocimiento de los estudiantes de enfermería a través de reflexiones sobre medidas inmediatas en relación con el cuidado del tétanos accidental.

DESCRIPTORES

Tétanos; Urgencias Médicas; Quemaduras; Educación en Salud.

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COLLABORATIONS

GLC and LSF: substantial contributions to study conception and design; data collecting, analysis and interpretation; the elaboration of scientific writing. EOS: substantial contributions to study conception and design; data analysis and interpretation; the elaboration of scientific writing and article critical review. RBS: substantial contributions to article critical review. All the authors agree and take responsibility for the content of this manuscript version to be published.

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There are no conflicts of interest to declare.