

RESTRICTING SPINAL MOVEMENT: THE KNOWLEDGE OF PROFESSIONALS IN ROAD RESCUE WORK

RESTRIÇÃO DE MOVIMENTO DA COLUNA: O CONHECIMENTO DE PROFISSIONAIS DE UM SERVIÇO DE RESGATE RODOVIÁRIO

RESTRICCIÓN DEL MOVIMIENTO ESPINAL: EL CONOCIMIENTO DE LOS PROFESIONALES DE UN SERVICIO DE SALVAMENTO VIAL

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ABSTRACT

Objective: to describe the knowledge of professionals from a road rescue service about spinal movement restrictions. **Method:** a qualitative, cross-sectional and descriptive study carried out with 12 professionals working in a road rescue service in southern Brazil. The information was collected in november 2021 using a semi-structured instrument and interpreted using content analysis. **Results:** the following categories emerged: care for the polytraumatized today and restriction of movement of the spine: concepts and applicability. **Conclusion:** it was clear that the majority of professionals only perform immobilization according to institutional protocols; they only assess the mechanism of the trauma and ritualized procedures, as well as having inadequate or superficial knowledge on the subject. We therefore suggest expanding continuing education through training, courses, lectures and workshops, and reformulating local protocols to improve professionals' knowledge.

Descriptor: Spinal Injuries; Manipulation, Spinal; Rescue Work; Emergency Responders; Knowledge

RESUMO

Objetivo: descrever o conhecimento dos profissionais de um serviço de resgate rodoviário sobre restrição de movimento da coluna. **Método:** estudo qualitativo, transversal e descritivo, realizado com 12 profissionais que atuam em um serviço de resgate rodoviário do sul do Brasil. As informações foram coletadas em novembro de 2021 através de instrumento semiestruturado e interpretadas através da análise de conteúdo. **Resultados:** emergiram as seguintes categorias: o atendimento ao politraumatizado hoje e restrição de movimento da coluna: conceitos e aplicabilidade. **Conclusão:** evidenciou-se que a maioria dos profissionais realizam a imobilização apenas por protocolos institucionais; avaliações somente pelo mecanismo do trauma e procedimentos ritualizados, além de não possuírem conhecimento adequado ou superficial sobre o tema. Com isso, sugere-se a ampliação da educação continuada através de capacitações, cursos, palestras, oficinas, e a reformulação de protocolos locais para aperfeiçoar o conhecimento dos profissionais.

Descritores: traumatismos da coluna vertebral; manipulação da coluna; trabalho de resgate; socorristas; conhecimento

RESUMEN

Objetivo: describir el conocimiento de los profesionales de un servicio de rescate vial sobre las restricciones de movimiento de la columna vertebral. **Método:** estudio cualitativo, transversal y descriptivo, realizado con 12 profesionales de un servicio de salvamento vial del sur de Brasil. La información fue recolectada en noviembre de 2021 mediante un instrumento semiestructurado e interpretada mediante análisis de contenido. **Resultados:** surgieron las siguientes categorías: atención al politraumatizado actual y restricciones del movimiento espinal: conceptos y aplicabilidad. **Conclusión:** es claro que la mayoría de los profesionales sólo realizan inmovilizaciones según protocolos institucionales, sólo evalúan el mecanismo del trauma y ritualizan los procedimientos, además de tener conocimientos inadecuados o superficiales sobre el tema. Por ello, sugerimos ampliar la educación permanente a través de capacitaciones, cursos, conferencias y talleres, y reformular los protocolos locales para mejorar el conocimiento de los profesionales.

Descriptores: Traumatismos Vertebrales; Manipulación Espinal; Trabajo de Rescate; Socorristas; Conocimiento

INTRODUCTION

Trauma is considered a serious public health problem, with a major social and economic impact resulting from events with a high release of energy, such as traffic accidents, gunshot wounds, falls, run-overs, etc. The high rates of morbidity and mortality and, mainly, the high costs associated with frequent permanent sequelae, put pressure on health systems to address this condition through a multidisciplinary approach, seeking to minimize damage through multiple strategies.¹

In this sense, health systems must be adequately organized to achieve good results in care. Health teams must be trained and constantly seeking training and updating regarding the initial management of these cases, since, according to several studies, mortality rates reach their highest levels in the first hour after the event, and 25% of deaths occur due to inadequate management.²

Thus, the main objective of treating patients with multiple traumas is to reduce and, if possible, eliminate the sequelae in the initial assessment, aiming to establish the victim's physiological balance, through the identification and treatment of injuries.³ Thus, it is worth noting that the incidence of spinal cord trauma is approximately 12 cases per 100,000 people, and this incidence increases with advancing age. Of the patients who suffer spinal cord trauma,

approximately 20% have spinal cord injuries, 10% have injuries to various segments of the spine and 10% have major ligament injuries.⁴

Despite this, trauma emergency care practices are unfortunately still copiously ritualized and limited and sometimes follow precepts from the past, as in the case of spinal immobilization techniques⁵, where theUntil 2018, the concept of total immobilization was used exclusively. In the same year, the National Association of Emergency Medical Services, the Committee on Trauma of the American College of Surgeons, and the American College of Emergency Physicians updated the recommendations to use “Restriction of Spinal Motion - CMR”, introducing the terms complete or minimalist CMR.⁶

Thus, the pre-hospital care (PHC) professional will have three possible choices related to CMR when faced with any trauma victim: no restraint, complete restraint or minimalist spinal restraint. It is considered important to bring this subject to light, as the theme is already being applied in some places in Brazil and introduced in the main guidelines in the area: American, British, South African, Norwegian, Danish, ITLS and PHTLS.⁷

It is believed that studies of this nature have a positive influence on the dissemination of knowledge and the victim receives evidence-based care, with the use

of critical thinking, improving the quality of care provided and thus getting closer to developed countries in terms of gold standard care. In view of this, this study has the following guiding question: “What is the knowledge of professionals in a road rescue service about spinal movement restriction?”. To answer this question, the proposed objective was to describe the knowledge of professionals in a road rescue service about restricted spinal movement.

METHOD

This is a qualitative, cross-sectional, descriptive study developed in a road rescue service in southern Brazil, which began operating in the region in January 1998. This service is currently responsible for 457.3 kilometers of highway BR 116 between the cities of Camaquã, Pelotas, and Jaguarão (260.5 km) and BR 392, which crosses the cities of Rio Grande, Pelotas, and Santana da Boa Vista (196.8 km). In addition, it has five ambulances for pre-hospital care, one of which is equipped with a mobile ICU, 7 doctors, 4 nurses, 25 nursing technicians, and 29 rescuers distributed across 6 strategic bases.⁸ Twelve professionals participated in this study, who were chosen according to the established criteria.

The inclusion criteria were: being a medical professional, nurse, nursing technician or rescuer; having been performing their activities at the location for

more than 6 months; being available to participate in the study; allowing the interviews to be recorded; agreeing to sign the free and informed consent form (TCLE) in two copies and allowing the data to be disclosed in scientific media.

The interviews took place in November 2021. Initially, contact was made with the board responsible for the service requesting permission to carry out the study and, after contacting the professionals who met the pre-established criteria for participation, the proposal was presented, followed by the signing of the TCLE, and subsequent reading of the questionnaire to those who consented to participate.

Each interview lasted approximately 8 minutes and took place on the premises of the road rescue service so as not to disrupt the workflow. In order to achieve the proposed objectives, as well as to answer the problem question, a semi-structured interview script consisting of open and closed questions developed by the researchers themselves was chosen.

All information was recorded via audio and later transcribed in full. The method used for data analysis and interpretation was content analysis. In this method, the core meanings that were part of the interviewees' communication were discovered and whose frequency of appearance meant something for the chosen analytical objective. Therefore, 3 distinct

stages were developed: 1) pre-analysis; 2) exploration of the material and 3) processing of the results and interpretation, as described by Minayo.⁹

All interviews were conducted anonymously, preserving the integrity of the study participants. In this sense, the professionals were identified with the letters M (doctor), E (nurse), TE (nursing technician) and R (rescuer) followed by the cardinal number according to the order of the interview.

The study complied with the ethical precepts established by Resolution No. 466/2012, which deals with the guidelines and regulatory standards regarding research involving human beings. In compliance with current legislation, the study was assessed and approved by the Research Ethics Committee of the Catholic University of Pelotas (UCPel), under substantiated opinion No. 4,950,923, dated September 2, 2021, and CAAE protocol No. 50778621.3.0000.5339.

RESULTS AND DISCUSSION

The study included 12 professionals who work in the road rescue service. Of these, 03 were nurses, 03 doctors, 03 nursing technicians and 03 rescuers. Regarding gender, 10 interviewees were men and 02 women. Regarding age range, the ages varied between 22 and 46 years. Regarding the time of service, this varied from 07

months to 11 years and most had another employment relationship in the area.

Below, the two thematic categories that emerged for this study are presented: “Care for polytrauma patients today” and “Restriction of spinal movement: concepts and applicability”.

Care for polytrauma patients today

APH is an emergency care whose main objective is to keep the victim alive, preserving the function of vital organs and, with the greatest possible stability until he can be transferred to the nearest hospital service. However, in the case of accidents on highways, these are almost always fatal.

According to data from the Mortality Information System (SIM), in 2013, the Brazilian rate was 21 deaths per 100,000 inhabitants, which is a cause for concern when compared to global standards. In 2016, there were 6,400 deaths on highways, according to the Federal Highway Police (PRF), with only fatal deaths recorded, i.e., those that occurred at the scene of the accident. Two years earlier, in 2014, direct and indirect public health costs due to highway accidents had reached R\$12.3 billion reais.¹¹

In Brazil, Ordinance GM/MS No. 1,863 and 1,864 of 2003 deals with the mobile pre-hospital component, emergency education centers and regulations. Therefore, it is established through the user service that

highways with a concession contract offer first aid care with qualified professionals including doctors, nurses, nursing technicians, drivers/rescuers and ambulances in case of any health problem on the concession stretch.¹⁰

In the present study, although the concessionaire that manages the highway recorded an 8% reduction in the number of accidents in the first half of 2023 when compared to the same period last year, 185 accidents were still recorded, some of which were potentially serious.¹² In this scenario, the professionals interviewed described how they provide care to polytrauma victims with regard to immobilization, mentioning that it is based on basic life support in trauma, highlighting the importance of assessing kinematics as a criterion for immobilization, as per the following statements:

[...] first we have to understand the kinematics when we reach the victim, restricting the movement of their cervical spine, doing an analysis of the XABCDE and after that, first proceed to immobilize fractures if there are any, do as stated in the protocol and immobilize on the board with three belts, and never forget that the cervical collar comes first. (TE1)

[...] assess the scene where the incident occurred, isolating the location, seeing how the trauma is kinematic, seeing how the vehicle is, for example, if there are any marks on the windshield (scratches) [...]. Then assess the victim using the XABCDE protocol and immobilize them on a rigid board to see their condition, proceeding with removal for further assessment in the emergency room. (R1)

I use the Brazilian College of Surgeons as a basis, which has the ATLS, one of the most widespread trauma courses and serves as a basis for many others as well. So, skipping the safety part of the scene, we first evaluate the kinematics to see if it is a red code,

a yellow code, or a green code, etc. [...] and we will follow the XABCDE of trauma. (M1)

The main criteria for immobilization would be the kinematics of the trauma and the patient's complaint. (E1)

We immobilize the victim according to the protocol established by PHTLS, where the ABCDE algorithm is applied. Now it has changed, the X is in front, which is now XABCDE [...] but first one goes to the victim, stabilizing the cervical region and inspecting the airway while the other signs the scene. (E2)

According to the literature, basic life support in trauma is a clear and well-defined sequence that highlights priorities that, if not resolved, will be of no use in moving on to the other stages of care. The initials XABCDE correspond to X (control of exsanguinating hemorrhages), A (airway management and stabilization of the cervical spine), B (ventilation and oxygenation), C (perfusion and other hemorrhages), D (neurological status), and E (exposure of the victim and control of hypothermia).¹³ However, with regard to immobilization, it is observed that professionals have become accustomed to making decisions based solely on the mechanism of injury, normally applying a cervical collar and a long rigid board to all trauma victims.

According to research, in the United States, for example, almost a million patients are evaluated for spinal cord injuries every year and only 2 to 3% actually have these injuries. However, not carrying out the entire immobilization process and the patient developing some disabling disability in the future is among the greatest fears of

American emergency physicians.⁴

Today, evidence proves that a change in concept and applicability in actions is needed and it is already possible to note that some emergency services are reviewing their protocols and removing the backrest, only allowing the use of the cervical collar and padded stretcher in some situations, while each victim has their own particularities during care and that unnecessary immobilization would be understood by professionals in definitive treatment as the existence of serious injuries, which would delay immediate interventions.¹⁴

Spinal movement restriction: Concepts and applicability

The main aim of CMR in trauma is to keep the cervical spine in a neutral position, preventing the development of injuries or aggravating existing ones. It occurs more frequently in unconscious or obnubilated patients. In the last decade, the topic has been the subject of intense discussion and updating, the latest being the introduction of the terms complete or minimalist CMR.⁴

M2's answer stands out as the closest to what would be recommended, emphasizing the fact that he had recently taken refresher courses with his own funding:

I have recently financed some courses and provide care to polytrauma patients in accordance with the guidelines of the ATLS program, guided by the

American College of Surgeons - Committee on Trauma, according to the criteria of the international protocols defined by consensus by the American College of Surgeons - Committee on Trauma (ACS-COT), American College of Emergency Physicians (ACEP) and National Association of Prehospital Physicians (NAEMSP) which defined 10 points that are in consensus in the literature, which were based on the NEXUS (National Emergency X-Radiography Utilization Study) and CCR (Canadian C-Spine Rule Study) studies. These are: Acutely altered level of consciousness (e.g., GCS <15, evidence of intoxication), pain and/or tenderness in the cervical midline or back, focal neurological signs (sensory and motor symptoms), anatomical deformity of the spine, circumstances or injuries that cause distraction (fractures of long bones, for example) or that reduce the patient's ability to collaborate for a reliable examination, among others. (M2)

The NEXUS and CCR protocols have a sensitivity of 99.4% and 90.7% and a specificity of 45.1% and 36.8%, respectively, and aim to guide APH professionals regarding CMR, in addition to which type of restriction to apply and which patients should undergo imaging exams in the hospital to rule out spinal injuries.⁵ Recent studies reinforce these findings. A retrospective review demonstrated that the use of CMR reduced the use of the rigid backboard from 31.2 to 12.7 per 100 trauma visits, with this being used only for patients with more severe conditions.¹⁵ In California, the use of such protocols combined with periodic training on CMR reduced the use of the rigid backboard by 58%, demonstrating that it is possible to use it only when essential.⁵

In this research, when asked about the concept of RMC, its types and applicability, about half of the interviewees confused the

concepts of immobilization and restriction, however some professionals demonstrate knowledge about the subject, with great emphasis again on M2:

Minimalist spinal movement restriction is one in which we perform measurements and use minimal devices to restrict movement in order to avoid injury, but prioritizing the shortest time to get the patient into the ambulance or to a safe place. (M2)

I understand that the option for minimalist restriction is complete: minimalist restriction results in no change in the level of consciousness with Glasgow 15 and hemodynamic stability; while restriction of complete spinal movements is based on, for example, spinal pain or instability, neurological deficiency or complaint of the patient, anatomical deformity of the spine or also if there is a suspicion that the patient is or has used alcohol or drugs. For me, this would be the indication for complete movement restriction. (E1)

Complete: the maximum amount of equipment is used for the least movement of the spine. Minimalist: it is the restriction with the minimum of equipment. (E2)

I understand about CMR, which is a new protocol in the health area, very little used, but which brings a greater index of benefits to the patient, causing the least injury to a polytrauma patient, and now I am sure that I need to update myself when it comes to these new concepts that emerged in 2018. (T3)

Spinal movement restriction is a set of measures that may or may not use devices such as a cervical collar, stretcher, headblock to maintain neutral alignment of the spine during patient transport with a view to avoiding spinal injury. Complete spinal movement restriction is when we use "all" the necessary devices and auxiliary measures in order to restrict spinal movement and consequently avoid injuries. (M2)

Assess the general condition of the victim, not necessarily if the victim is on the ground they need to be immobilized, just as if the victim is walking they do not need to be immobilized [...]. We assess everything to see if it is indicated, if it is necessary or not. (R2)

These are two topics that really generate doubts among professionals, but both aim to prevent injury to the patient's spine. (M1)

The term immobilization was used

until 2018 and referred to the idea of completely restricting movement of the spine. In the same year, after scientific studies were carried out, the literature began to use the name RMC because it was understood that there is no way to provide true immobilization, but rather only to limit and/or reduce spinal movements.⁴ To prove the effectiveness and safety of this change, a study developed at the University of Cambridge in the United Kingdom studied 1,172 patients in a trauma center and concluded that there was no significant increase in the incidence of disabling injuries with the insertion of the RMC protocol.¹⁶

It was noted that some interviewees responded that due to "insecurity" or lack of knowledge, they chose to maintain "complete immobilization" for all victims, regardless of the criteria available in the literature:

I advocate immobilization of the cervical spine with a collar and rigid board, and if the patient needs to be moved, movement should be done using a block. For any patient with multiple traumas, such as a car accident, motorcycle accident or fall from a height greater than their own height, I advise the team to immobilize the patient with a collar and rigid board.. As for what is full-spine and minimalist movement restriction, I don't know how to answer. (M3)

So far, here in the region, we have only heard about this new protocol that was implemented in some cities in Brazil, but here in Brazil we have not yet applied it. Well, in some situations, this column restriction applies, but it is not a protocol because the protocol we follow is to always err on the side of excess and never on the side of lack. (E3)

Some authors list as the main harmful

effects related to spinal immobilization the difficulty in managing the airways in addition to compromising mouth opening; aspiration can result more easily in emesis; the cervical collar can increase intracranial pressure (ICP) by an average of 4.5 mmHg; venous congestion secondary to the cervical collar can exacerbate global brain injuries; discomfort; pain; pressure injury; and a greater likelihood of the victim being subjected to radiological examinations, delaying the evaluation.^{3,17}

In this context, it is important to emphasize that it is necessary to abandon the universal approach to trauma victims and adopt an individualized approach, related to the clinical condition and the mechanisms involved.¹⁴ However, it is clear that often during APH, care is centered solely on the physician, who makes most of the decisions, with no participation of the other team members regarding the measures that should be adopted, demonstrating the culture of arrogance that is still very present in this professional category. This can be observed in a study in Rio Grande do Sul, mentioned above, where it is noted through the statements of the interviewees that all team members wait for medical approval to carry out the restriction or discard it before taking the patient for in-hospital care.⁵

Aiming to change the paradigm and achieve healthy professional relationships at work, many emergency services strongly

invest in ongoing training. An international study conducted in Australia demonstrated a 94.3% level of agreement among first responders during care¹⁸; in Canada, the agreement between medical and nursing assessments was even higher, reaching 95%, and 82% of nurses felt more confident in applying the CCR protocol to victims, which consequently reduced the number of immobilization cases during accidents on the country's highways by 25%.¹⁹ In the Netherlands, nurses receive training in accordance with the latest protocol updates, providing high-quality, effective care based on team unity.²⁰

CONCLUSION

Through the results obtained, it was evident that most professionals did not have adequate knowledge about the restriction of spinal movement, often using the restriction concept, but performing modern-day immobilization using a collar, rigid board and belt for all victims.

When asked about the assessment of the victim, they used the injury mechanism, kinematics and XABCDE of the trauma, and most of the time they thought it would be better to immobilize the victim with a collar, rigid board and belt for safety reasons, and only removed it after imaging tests and other necessary exams at the referral hospital. It was also noted that they did not feel safe when they did not restrict the movement of

the cervical spine, either due to fear of the risk of injury, lack of knowledge or outdated techniques, thinking that it would not work.

It is therefore suggested that emergency services apply restrictions on the operation of their teams, implementing the standard operating plan (SOP), dissemination, campaigns on the subject and training focused on the clinical evaluation of the patient, thus allowing safer and more cost-effective care, always taking as a guide the best evidence and randomized studies based on RMC.

The limitations of this study refer to the fact that it was carried out only in the road rescue service, not including the Mobile Emergency Care Service (SAMU) or the fire department of the local city, which sometimes provide assistance on the BRs that were part of the research. The low level of evidence in much of the literature was also noted, demonstrating the need for more robust research to expand this discussion.

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