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Pain management in trauma patients in (pre)hospital based emergency care: Current practice versus new guideline

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ABSTRACT

Introduction: Acute pain in trauma patients in emergency care is still undertreated. Early pain treatment is assumed to effectively reduce pain in patients and improve long-term outcomes. In order to improve pain management in the chain of emergency care, a national evidence-based guideline was developed. The aim of this study was to assess whether current practice is in compliance with the guideline 'Pain management for trauma patients in the chain of emergency care' from the Netherlands Association for Emergency Nurses (in Dutch NVSHV), and to evaluate early and initial pain management for adult trauma patients in emergency care.

Methods: Chart reviews were conducted in three regions of the Netherlands using electronic patient files of trauma patients from the chain of emergency care. We included one after-hours General Practitioner Co-operation (GPC), one ambulance Emergency Medical Services (EMS), two Helicopter Emergency Medical Services (HEMS), and three Emergency Departments (EDs). Organisation of pain management, pain assessment, and pain treatment was examined and compared with national guideline recommendations, including quality indicators.

Results: We assessed a random sample of 1066 electronic patient files. The use of standardised tools to assess pain was registered in zero to 52% of the electronic patient files per organisation. Registration of (non-)pharmacological pain treatment was found in less than half of the files. According to the files, pharmacological pain treatment deviated from the guideline in 73–99% of the files. Time of administration of medication was missing in 73–100%. Reassessment of pain following pain medication was recorded in half of the files by the HEMS, but not in files of the other organisations.

Conclusions: The (registration of) current pain management in trauma patients in the chain of emergency care varies widely between healthcare organisation, and deviates from national guideline recommendations. Although guideline compliance differs across groups of healthcare professionals, maximum compliance rate with indicators registered is 52%. In order to improve pain management and evaluate its effectiveness, we recommend to improve pain registration in patient files. Furthermore, we advise to identify barriers and facilitators related to the implementation of the national guideline in all emergency care organisations.

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Introduction

Treatment of acute pain in emergency care still gets insufficient attention [1]. Acute pain and trauma are often closely related to one another, as pain is induced by noxious stimuli at the site of tissue damage [2]. Recent studies show that the prevalence of pain in trauma patients in the Dutch (pre-hospital) emergency care setting is 70–91% [1,3]. In contrast to the improved treatment of postoperative and chronic pain [4,5], the treatment of acute pain in emergency care is low [1]; only 19–30% of trauma patients receive pharmacological pain treatment [1,3].

Emergency care for trauma patients encompasses the care for patients with recent (within 24 h) suspected injuries caused by blunt or penetrating forces, falls, explosions, heat/cold or chemical toxicants. In the Netherlands, emergency care is provided by General Practitioners (Co-operations) (GP(C)s), ambulance Emergency Medical Services (EMS), Helicopter Emergency Medical Services (HEMS), and Emergency Departments (EDs). Collaboration between healthcare professionals in the chain of emergency care with respect to pain management is not optimal, making it very difficult to guarantee continuity of care. As a consequence, pain treatment is not always applied, not continued or contradicts the pain management by the preceding professional partner in the chain [6]. The undertreatment of acute pain can have an adverse effect on the outcome of the treatment, e.g. a delay in wound healing, and causes a longer period of recovery [7]. Furthermore, poorly treated acute pain can result in chronic pain [8]. Early pain treatment is therefore of great importance.

To improve pain management in trauma patients, a national evidence-based guideline 'Pain management for trauma patients in the chain of emergency care' was developed in 2010 [9]. This multidisciplinary guideline from the Netherlands Association for Emergency Nurses (in Dutch NVSHV) provides clear recommendations and quality indicators for early pain management in evaluable, adult trauma patients in the chain of emergency care, concerning pain assessment, (non-)pharmacological pain treatment, and the organisation of pain management.

The objective of this study is to assess whether current practice is in compliance with the Dutch guideline recommendations, and to evaluate early and initial pain management for adult trauma patients in the chain of emergency care. The evaluation provides insight into the extent to which the guideline is already used by healthcare professionals in the chain of emergency care. It identifies the adherence and deviations in current practice from the quality indicators in the guideline, and provides a starting point for the implementation of the guideline.

Materials and methods

Design

Between January and March 2012 (HEMS from October 2011 to March 2012) chart reviews were conducted, assessing electronic patient files of trauma patients from seven organisations in the chain of emergency care, in three regions of the Netherlands; one after-hours GPC (suburban), one EMS (suburban), two HEMS (suburban and urban), and three EDs (rural/suburban, suburban and urban). Trauma patients were defined as patients with (suspected) injuries, due to mechanisms of blunt or penetrating forces, falls, explosions, heat/cold or chemical toxicants [10]. Patient files were used to assess whether current practice is in compliance with the guideline 'Pain management for trauma patients in the chain of emergency care' from the NVSHV and to evaluate pain assessment and current pain management for adult trauma patients in emergency care.

Setting

The target group of the guideline consists of GPs, physicians and nurses in ambulance EMS and the ED, and team members of the HEMS. Dutch GPs organise their after hours primary care – weekdays 5PM to 8AM and weekend – in large-scale GPCs [11]. Telephone triage nurses assess the urgency of patient's health problem and decide – based on triage protocols [12] and guidelines – the appropriate action to be taken [11], e.g. using paracetamol. In addition, out-of-hospital emergency care is also provided by nurses in EMS; registered nurses who followed a national training programme and deliver pre-hospital care autonomously, based on national protocols. These national protocols assist the nurses in the limited use of Fentanyl, Ketanest (S-Ketamine), and Midazolam in case of a trauma [13], However, nurses may decide to deviate from the protocol (stating reasons) based on the patient's condition and circumstances, or follow advices from regional protocols, e.g. using paracetamol. Care provided by EMS nurses can be complemented by team members of a HEMS. Four HEMS, which are available on a 24/7 basis for the whole country, are equipped with a specially trained team including a HEMS physician (trauma surgeon or anaesthesiologist), a registered flight nurse, and a pilot. This team is capable of delivering hospital-level medical care and advanced pain management at the accident site, including the use of anaesthesia and certain analgesics. At the ED, a triage nurse assigns an urgency level to the patient's health problem [14], and may decide to give a patient certain pain medications before treatment by a physician. Care at the ED is provided by registered physicians and nurses who followed additional training in emergency medicine.

Guideline

The national evidence-based guideline was developed in 2010 by a multidisciplinary working group consisting of representatives from all relevant professionals working in emergency care: general practitioners, EMS nurses, HEMS physicians and nurses, physicians and nurses working in the ED, nurse practitioners, physician assistants, anaesthesiologists and physicians of surgical and orthopaedic traumatology departments. The guideline offers professionals recommendations and indicators, concerning pain assessment, initial (non-)pharmacological pain treatment, and the organisation of pain management in the chain of emergency care. The guideline has been distributed among these organisations, but has not yet been actively implemented nationwide.

The guideline recommends to register pain scores, initial (non-)pharmacological pain treatment and time of administration of medication in the medical records. The guideline suggests to use the verbal Numeric Rating Scale (NRS), a scale from zero to ten with zero as no pain and ten as unbearable pain, to assess pain score. Pain needs to be assessed at least three times; at arrival, after (non-)pharmacological intervention, and at the end of the medical visit. Non-pharmacological treatment of patients with fractures, contusions, and soft tissue injuries should be delivered according to the RICE#-criteria – Rest, Ice, Compression and Elevation.

According to the guideline, initial pharmacological pain management should be given as indicated by algorithms, designed specifically for ambulance EMS, HEMS, GP(C) and ED (Figs. 1–3). These algorithms consist of several routes concerning pain treatment for mild (NRS < 4), moderate to severe (NRS 4–7) and unbearable pain (NRS > 7). In the guideline, paracetamol is the pharmacological treatment of first choice, if necessary with additional use of non-steroidal anti-inflammatory drugs (NSAIDs) or opioids. Fentanyl and Morphine can be given for severe to unbearable pain during emergency care. Administering Ketanest can be considered in case of severe or unbearable pain in combination with hypovolemia.