Determinants of inappropriate acute pain management in old people unable to communicate verbally in the emergency department

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ABSTRACT

Objectives: Poor pain management is relevant among individuals unable to communicate verbally (UCV). Analgesia may be due to three determinants: patients' status, physician's characteristics and pain etiology. Our aim is to investigate the association between prescription of ED pain treatment and these determinants.

Materials and Methods: An observational prospective study including UCV patients was conducted. Severity of pain was evaluated by ALGOPLUS Scale and a score $P \geq 2$ out of 5 on the pain scale was retained as the threshold for the presence of acute pain in elderly UCV patients.

Results: Our data showed that only 31,9% of UCV patients received a pharmacological treatment. The presence of the caregiver would influence the rate of therapy administration [OR 6,19 (95% CI 2,6 −14,75)]. The presence of leg pain [OR 0,32 (95% CI 0,12−0,86)] and head pain [OR 0,29 (95% CI 0,10 −0,84)] were less likely associated to receive analgesia. Pain related to trauma [OR 4.82 (95% CI 1.17 to 19.78)] and youngest physicians [OR 1.08 (95% CI 1.001 to 1.18)] were variables associated with the administration of drugs opiates.

Discussion: Older UCV patients presenting to the ED with pain are at high risk of inadequate analgesia. Providers should always suspect presence of pain and an increasing need for behavioural pain evaluation is necessary for a complete assessment.

Conclusions: Presence of a caregiver influences a more appropriate pain management in these patients. Staff training on pain management could result in better assessment, treatment, and interaction with caregivers.

1. Introduction

Pain treatment in the Emergency Department (ED) plays a challenging role in daily clinical practice since up to 60% patients do not receive adequate pain management in this particular setting.[1] A high risk of oligoanalgesia has been identified for patients that are unable to express and further define their discomfort (defined as Unable to Communicate Verbally, UCV), for whom it is essential to perform routine pain assessment in order to improve pain management and global care.[2,3] Among these, elderly patients, a large portion of ED population, represent a conspicuous percentage.[4]

Since impaired mental status is reported in approximately 25% of elderly people, comprehensive pain assessment through self reports, as recommended in recent international statements,[5] is not always obtainable.[6,7]

Behavioural observations represent a good option to detect pain presence in similar situations. Particularly, the ALGOPLUS Pain Scale has been validated to measure pain in a geriatric non-communicative population in the ED.[8] To our knowledge, no previous studies have analysed factors predicting oligoanalgesia in these vulnerable patients.

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The Direct Acyclic Graph (DAG) in Fig. 1 illustrates the possible framework of "analgesia pathway" in the ED. DAG is a graphical tool for epidemiological research that helps doctors to directly specify a causal pathway and model, in order to avoid biased estimates of the covariate effects on the outcome.[9] In our opinion, oligoanalgesia may be due to three determinants: I) patients' status (caregiver's presence, marital status, educational attainment, retirement home residence), II) attending physician's characteristics (age expressed as proxy of years from medical degree and gender), and III) pain etiology.

The aim of our work is to evaluate variables that could influence ED pain treatment in UCV patients.[10,11]

2. Materials and methods

2.1. Study design, setting and selection of participants

We performed a single-centred observational prospective study in the setting of the ED in the Santa Croce and Carle Hospital in Cuneo, a Northern Italy urban university-affiliated hospital with an annual census of about 80,000 ED discharges. Before the study conduction, no coded and locally approved protocol for pain management in the ED existed. Between November 2010 and June 2011, during triage evaluation, a random sample of UCV patients presenting with acute pain was selected.

The entire ED medical staff was involved in the study and were kept blind to the study outcomes.

All UCV patients, over 65 years, presenting with acute pain (including traumatic injuries, e.g. fractures, abdominal, musculoskeletal, thoracic pain, and acute peripheral vascular disease)[12–15] were eligible.

UCV patients were defined as patients with delirium (screened using Confusion Assessment Method[16]), and/or aphasia, moderate-to-severe cognitive impairment (detected using a Six Item Screener in the ED setting[17]), and/or poor/null knowledge of the Italian language, and/or unable to fill out self-rating scales.

Exclusion criteria were absence of pain, chronic pain (length > 2 weeks), narcotic pain medications received in pre-hospital care, hemodynamic instability patient or caregiver unwilling to provide informed consent for participation.

The study protocol was designed respecting Helsinki declaration principles for clinical research on human subjects and obtained Hospital Review Board approval.
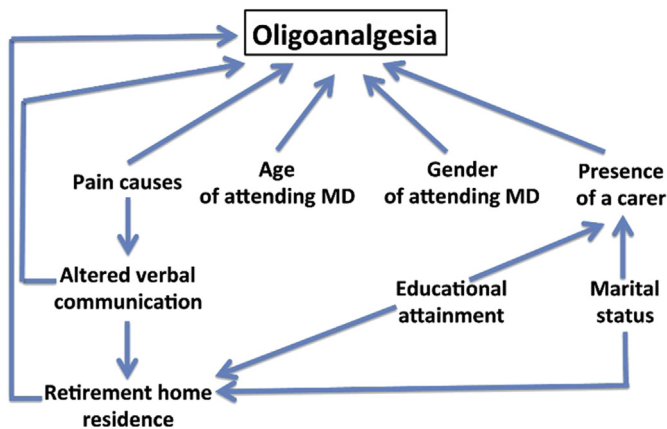
2.2. Methods of measurement and outcome measures

Data were obtained using an *ad hoc* spreadsheet including age, gender, ethnicity, triage priority level (emergency or urgency, and semi- or non-urgent), educational level (expressed as years of training), residence characteristics (home vs retirement home), length of stay in ED (in days), age and gender of physician in charge for each patient, presence of a caregiver, marital status (married or unmarried), details on location and duration of pain.

Pain severity was assessed using the ALGOPLUS Pain Scale, a score above 2/5 points was considered positive for acute pain presence (Fig. 2).[8] Any kind of drug prescribed to reduce pain, such as acetaminophen, non-steroidal anti-inflammatory drugs, opioids and others (for example, antacids for abdominal pain, nitrates for chest pain) was collected as analgesic.

2.3. Outcomes

The aim of our study is to investigate the prescription of ED pain treatment and its possible determinants. Secondary outcomes included details on drugs used, time to administration and length of stay in the ED.[10,11]

2.4. Statistical analysis

Continuous variables were reported as mean ± Standard Deviation (SD) or median and InterQuartile Range (IQR); categorical variables were presented with numbers and percentages. Associations between categorical variables were assessed with Chi-Square test; comparison between continuous variables was performed using ANOVA and Wilcoxon test. A two-tail p value lower than 0.05 was considered for statistical significance.

Based on the previous international literature and the DAG (see Fig. 1), we chose the variables to include di our models. Then unconditional multivariate logistic regression models were used to evaluate the relationship between clinical features and pain therapy proxies. Any ED pain medication, any opioid drugs used in the ED, discharge pain treatment, timing of pain therapy for all enrolled patients, and for those triaged as low-urgent risk were used as dependent variable in each models and we chose different covariates for each multivariate models in order to avoid the risk of saturate them (independent variables chosen were showed in Table 2).

NCSS ver.2007 and Stata 13.1 (Stata Corporation, College Station, Texas, USA) were used to perform statistical analysis.[18]

Fig. 1. Directed Acyclic Graph (DAG) for "oligoanalgesia pathway" in the ED. A directed path is a sequence of arrows, a graph is acyclic if no directed path forms a closed loop. An arrow between two variables represents the possible presence of causal influence.

Score each grouped item yes/no for *presence* or *absence*	Yes	No
1- Facial expressions: frowning, grimacing, wincing, clenched teeth, unexpressive		
2- Look: inattentive, blank stare, distant or imploring, teary-eyed, closed eyes		
3- Complaints: "ow-ouch", "that hurts", groaning, screaming		
4- Body position: Withdrawn, guarded, refuses to move, frozen posture		
5- Atypical behaviors: agitation, aggressivity, grabbing onto something or someone		
Total YES	/5	

Fig. 2. Acute pain-behavior scale for older persons with inability to communicate verbally.