

Pain Management with Opiates in the Emergency Department

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Abstract

Although the goal of therapy in acutely painful conditions is to supply adequate analgesic to alleviate pain, these situations are known to be undervalued and undertreated in EDs worldwide. Patients' assessment of pain should be the only reference when deciding whether to provide analgesics or not. The patients' clinical features should help tailor the analgesic management. The implementation of clear-cut protocols of pain management is to be stressed on to improve records of pain evaluation and shorten time spent before the first analgesic given. Obligatory recording of pain scores, pain assessment and reassessment in predefined timeframes and analgesic treatment in the first 30 minutes of presentation cannot be overemphasized.

Opiates represent the best choice as a reference drug to cease pain perception in most situations. Dose and route of the medications are to be adjusted to the personal needs, although i.v. administration is often the most feasible and practical way to elicit the intended effect.

Keywords: Analgesia; Opioids; Pain Management; Emergency Department; Pain Therapy; Treatment; Acute Injury

Pain as a complaint in the emergency setting

Pain is recorded as the commonest complaint on admission in the acute setting [1]. In 2008, roughly, 45% of ED visits were noted to have involved either moderate or severe pain [2]. The International Association for the Study of Pain (IASP) describes pain as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage' [3]. Early and expedient treatment of pain is important to alleviate both short-term and long-term consequences of acute pain, which is known to respond to the management of the underlying condition [4].

Assessment of pain

Pain is what the patient describes it is. A wide array of psychological, sociocultural, temporal and situational variables impacts how human beings perceive and express pain he or she feels. Age, sex, ethnicity, accompanying psychological and economic status of the individual are the factors that have an impact the way a patient transmits complaints. Females are likely to describe the degree of pain higher than males and are administered more painkillers [5].

The assessment of pain in the acute situation involves the site, quality and severity of the discomfort. Although some authors advocated the use of physiological parameters to evaluate the properties of pain, they are more useful to verify a clinical impression. Physiological clues such as tachycardia, hypertension or restlessness may help determine the requirement for pain management in intubated or incoherent patients [6]. Additional findings that suggest pain in the unconscious patient may be agitation, sweating, pallor, pupillary dilatation, moaning, grimacing and flinching [7]. Abdominal and thoracic pain results in decreased tidal volume, vital capacity, and in turn, alveolar hypoventilation [8]. Intestinal secretions increase and smooth muscle sphincter tone is enhanced in the gastrointestinal system. Increased systemic vascular resistance and alterations in sympathetic tone resulting from pain may mask hypovolemia, thus may preclude adequate fluid resuscitation.

Because of the lack of objective criteria, the clinician must rely on the patient to provide key information on the localization, quality and severity of the pain. The value of the patients' description

of the location and nature of the discomfort has been proved in the context of formal teaching and routine practice, though physicians frequently question the reported severity and rely on their own estimates [9].

Some researchers pointed out that the elderly can influence perception, assessment, and treatment of acute pain, resulting in inadequate pain control for geriatric patients.

Seventy percent of the elderly with trauma received analgesia, compared with 84% of those 18 - 64 years old [10]. Trauma patients ≥ 65 years of age are less likely to receive analgesia than the younger ones in the ED and waited longer to get it. In the recent years, reports from both developed and developing countries have kept claiming that a high percentage of patients were discharged with unacceptable pain levels [11,12]. In Morocco, researchers cited that up to one-fourth of patients felt their pain unrelieved upon discharge from the ED [12].

The phenomenon called "opiophobia" can be prevented with reliance to basic rules of opioid use [13]. Respiratory depression is encountered seldom if titrated to effect. Moreover, the emergency physicians are able to manage the patient in extremis in these situations. Interestingly, researchers pointed out that insufficient pain management were common in opioid dependent individuals- nearly half of these patients are undertreated in EDs [14].

Strategies to improve pain management

Hatherley, *et al.* performed a systematic review on 992 abstracts encompassing pain management and a total of 15 studies underwent analysis [15]. They concluded that nurse led analgesia protocols should be encouraged to improve incidence of documented pain assessment and reduce time to analgesia. In 2015, Pierik, *et al.* suggested the use of multimodal pain management or the implementation of a pain management protocol might be useful methods to optimize pain relief in Netherlands EDs [11].

In 2014, Sampson, *et al.* published a systematic review on seven databases for researches reporting pain management outcomes after intervention to change professional practice to improve pain management in the ED [16]. They pointed out the insufficiencies in the theoretical framework and understanding, and indicated that many interventions reported improvements in pain management, but for now, evidence is inadequate to recommend any for universal adoption. These findings are in accord with the report by Dale, *et*

al. in Norwegian EDs that evaluation and treatment of pain in the ED are inadequate and not in line with the local protocols [17]. Interestingly, patients with low oxygen saturation and systolic blood pressure were less likely to be asked about pain. Of those with moderate and severe pain (58%), only 14% received pain relief in this study.

Israeli researchers have recently studied on the treatment of pain resulting from trauma within combat casualty care [18]. The most common analgesics administered at point of injury were opioids (morphine and fentanyl) and the most common route of administration was intravenously. They have reported that more casualties are receiving pain management treatment early in casualty care, if not directly at point of injury. There are other studies reporting ketamine as a feasible and logical alternative in prehospital analgesia in trauma care by paramedics [19]. Although new opioid addiction in emergency patients constitutes the rationale for opiophobia, some studies proved that iatrogenic opioid addiction is too rare to anticipate e.g. zero to 4 cases per ten thousand hospitalized patients receiving opioid analgesia were detected [20,21].

Recommendations on the acute severe pain management

Although there are many patients whose pain could effectively be controlled with non-opioid agents, opioids are the drugs of choice for the control of severe acute pain.

As a general principle of pain management, opioids should always be titrated in reasonable quantities to a pre-determined quantitative end-point, while patients are monitored for adverse effects. In general, administration of intravenous opioids requires pulse oximetry and close observation. The physician should also keep in mind that clinical observation is subjective and a drop in pulse oximetry could be a late sign. Non-invasive capnometry is more rapid and thus should be the preferred method to detect hypercapnia. Although these are important considerations, complications are quite rare, when patients are carefully selected and the choice, dose, route, and frequency of opioid are individualized.

Route and dose of administration

In general, severe pain usually requires intravenous analgesia, because this provides the most rapid onset of pain relief. Titration of intravenous opioids remains the standard of care in treating acute severe pain [22]. Table 1 summarizes use of opioid drugs and characteristics.

Drug	Initial dosing	Duration of effect (hour)	Side/adverse effect
Narcotic agonists			
Morphine	0.1 mg/kg iv	3 - 4	Respiratory depression (rare)
Meperidine	0.75 - 1.0 mg/kg iv	2 - 3	Respiratory depression (very rare)
Fentanyl	1.0 - 2.0 µg/kg iv	1 - 2	Respiratory depression, chest wall rigidity (very rare)
Narcotic antagonist			
Naloxone	0.2 - 0.4 mg iv (up to 2 mg)	2 - 3	Tachycardia

Table 1: Opioid drugs and characteristics.

Physicians often use the wrong route of administration. Intramuscular (IM) dosing versus intravenous (IV) dosing is an example of this. IV dosing allows the carers the ability to appropriately titrate medication for pain relief with a fairly rapid onset of action. IM dosing not only limits the physicians' ability to titrate, but the onset of action is longer than IV and may further be limited by any underlying pathologic state that is associated with decreased perfusion. In addition, IM injections are painful [23].

Since all opioids are lipophilic, it may be reasonable to administer opioids subcutaneously in patients who do not have IV access. Subcutaneous administration of opioids offers several advantages over intramuscular administration, such as less pain with injection, more predictable effects, fewer deep tissue complications [24].

The equivalent doses of all opioids are based on the "gold standard" of 10 mg of parenteral morphine [25,26]. Among the most commonly used opioid derivatives, the semi-synthetic compound -fentanyl- is the most potent opioid with a potency 100 times that of morphine.

A common approach is to begin treating severe pain with intravenous morphine 4 - 6 mg titrated every 8 - 10 minutes [27]. Subcutaneous morphine 10 mg titrated every 30 minutes can be used in patients lacking IV access. Dosing adjustments should be made downward in the elderly or those with precarious underlying medical conditions.

Physicians often underdose or fail to give analgesic drugs in the right frequency [23]. A general principle of pain management is that smaller doses of analgesics are required to prevent pain than to treat pain. Analgesics are optimally administered at short fixed intervals before pain recurs [25,28].

Conclusion

Decisions regarding administration of pain medications are impaired by a full range of biases, e.g. based on age, gender and ethnicity. Concerns of addiction, inadequacy of education with respect to opioids and other analgesics also contribute to the treatment failure.

Mandating pain score reporting, pain assessment and reassessment within specific timeframes and analgesia administration within 30 minutes of arrival is highly recommended. The implementation of clear-cut protocols of pain management should be encouraged to improve records of pain assessment and reduce time to analgesia.

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