ORIGINAL RESEARCH

Comparison of IV acetaminophen and IV opioid for patients presenting to emergency department with acute pain condition

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ABSTRACT

Background: Pain is one of the most common reasons for patients to visit the emergency department.The present study was conducted to compare IV acetaminophen and IV opioid for patients presenting to emergency department with acute pain condition.

Materials & Methods: 60 patients admitted in emergency department for pain of both genders were divided into 2 groups of 30 each. Group I received 1 g IV intravenous acetaminophen over 5–10 minutes and group II received Morphine 0.1 mg/kg IV over 5–10 minutes. Pain score was recorded at 30 minutes and 60 minutes. Patient satisfaction was measured using a 5-point Likert scale.

Results: Group I had 32 males and 28 females and group II had 35 males and 25 females. The mean VAS at 30 minutes in group I was 6.5 and in group II was 6.7 and at 60 minutes was 2.1 in group I and 2.0 in group II. The difference was non-significant (P> 0.05). There was 1 dissatisfied patient in group I, 4 neutral in group I and 2 in group II. 20 satisfied in both group I and II and very satisfied in 5 in group I and 8 in group II respectively. The difference was non- significant (P> 0.05).

Conclusion: IVacetaminophen provided comparable degrees of pain alleviation to opiates/opioids post treatment in individuals coming to the ED with a variety of pain disorders.

Key words: acetaminophen, opioid, emergency department

Introduction

Pain is one of the most common reasons for patients to visit the emergency department (ED). Due to the extensive number of visits to the ED related to pain, emergency medicine (EM) physicians and midlevel providers should be experts in providing safe, effective, and timely pain management.[1] Given the ongoing opioid epidemic across the country, EM clinicians are uniquely positioned to combat this crisis by broader utilization of non-opioid analgesia, thoughtful prescribing of parenteral and oral opioids in the ED and at discharge and identifying and treating patients with opioid use disorder in the ED.[2] For many years, acetaminophen has been a standard in pain management. For more than 20 years, the IV formulation has been routinely utilized in adults and children throughout Europe. In the United States, the Food and Drug Administration granted IV APAP full approval in 2010. The mechanism of action of APAP-induced analgesia remains unknown.[3] The primary analgesic action of APAP is thought to be caused via cyclooxygenase inhibition, N-methyl-d-aspartate receptor inhibition, and serotonergic antagonism in the central nervous system. Traditional APAP formulations include oral and rectal versions. Aside from the mode of administration, the pharmacokinetic parameters of the IV formulation differ significantly. IV APAP causes a rapid increase in plasma concentration.[4] Although opioid use has switched from prescribed to illegal opioids such as fentanyl and heroin, careful opioid use in the clinical environment is still necessary.[5] However, 61 to 71% of patients report to the Emergency Department with a painful condition, and opioids are routinely utilized to manage acute pain. Finding a balance between unrelieved pain and preventing opiate usage and, as a

result, probable overdose deaths is difficult.[6]The present study was conducted to compare IV acetaminophen and IV opioid for patients presenting to emergency department with acute pain condition.

Materials & Methods

The present study consisted of 60 patients admitted in emergency department for pain of both genders. All gave their written consent to participate in the study. Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 30 each. Group I received 1 g IV intravenous acetaminophen over 5–10 minutes and group II received morphine 0.1 mg/kg IV over 5–10 minutes. Pain score was recorded at 30 minutes and 60 minutes. Pain was measured and recorded as NRS pain scores, in which zero means no pain and ten is the worst pain imaginable. Patient satisfaction was measured using a 5-point Likert scale with the following options for reply: very dissatisfied; dissatisfied; neutral; satisfied and very satisfied with the pain treatment.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I: Distribution of patients

Parameters	Group I	Group II
drug	1 g IV intravenous acetaminophen	0.1 mg/kg IVMorphine
Male	32	35
Female	28	25

Table I shows that group I had 32 males and 28 females and group II had 35 males and 25 females.

Table II: Comparison of pain in both groups

NRS pain scores	Group I	Group II	P value
30 minutes	6.5	6.7	0.92
60 minutes	2.1	2.0	0.97

Table II, graph I shows that mean VAS at 30 minutes in group I was 6.5 and in group II was 6.7 and at 60 minutes was 2.1 in group I and 2.0 in group II. The difference was non- significant (P> 0.05).

Graph I: Comparison of pain in both groups

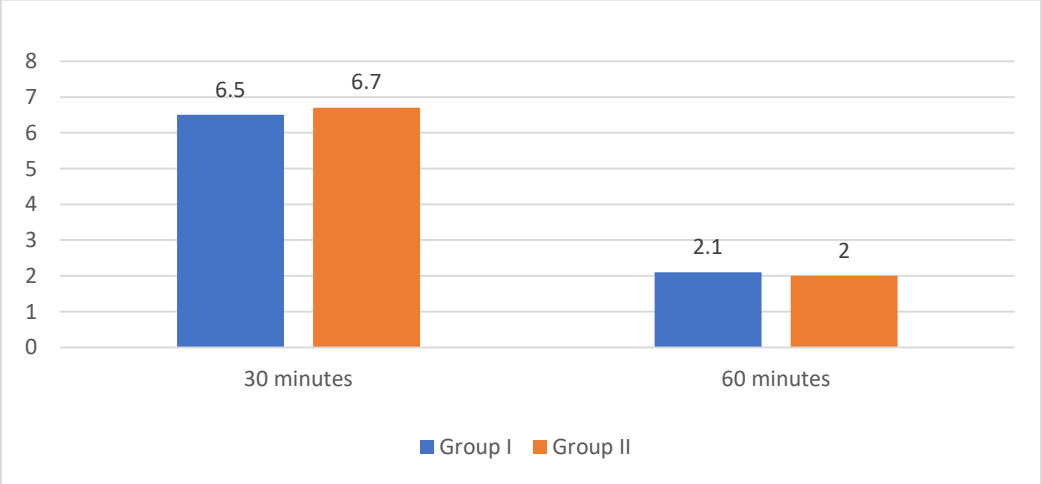

Table III: Evaluation of patient satisfaction

Patient satisfaction	Group I	Group II	P value
very dissatisfied	0	0	0.16
dissatisfied	1	0	
neutral	4	2	
satisfied	20	20	
very satisfied	5	8	

Table: III shows that there was 1 dissatisfied patient in group I, 4 neutral in group I and 2 in group II. 20 satisfied in both group I and II and very satisfied in 5 in group I and 8 in group II respectively. The difference was non- significant (P> 0.05).

Discussion

ED practitioners must note that routinely used opioids in the ED differ greatly in their capacity to generate euphoria, potentially leading to addiction.[7] According to the research, morphine sulfate delivered parenterally or orally in the ED and after discharge provides a better balance of appropriate analgesia and less euphoria and should be considered the opioid of choice.[8] When morphine is contraindicated but opioid analgesia is still required, parenteral fentanyl and oral hydrocodone are acceptable options in the emergency department and at discharge. Because of the elevated rates of respiratory and central nervous system depression (relative to morphine), parenteral and oral hydromorphone should be avoided as a first-line opioid in the ED.[9]The present study was conducted to compare IV acetaminophen and IV opioid for patients presenting to emergency department with acute pain condition. We found that group I had 32 males and 28 females and group II had 35 males and 25 females. The mean VAS at 30 minutes in group I was 6.5 and in group II was 6.7 and at 60 minutes was 2.1 in group I and 2.0 in group II. In a study by Blok et al[10], there were 116 patients in all, with 76 receiving intravenous acetaminophen. In the acute phase, there was no significant difference in opioid intake between patients receiving (10.0 MEU (IQR 7.5; 15.0)) and those not taking acetaminophen: 10.0 MEU (IQR 7.1; 15.0). Following discharge, these figures were 15.0 MEU (IQR 7.5; 30.0) against 30.0 MEU (IQR 15.0; 43.8) (p=0.059). In both groups, the median NRS pain score fell from 9.0 to 4.0, and more than 80% of patients were satisfied with their pain therapy. Nine minor adverse events were recorded and distributed evenly across the groups. We found that there was 1 dissatisfied patient in group I, 4 neutral in group I and 2 in group II. 20 satisfied in both group I and II and very satisfied in 5 in group I and 8 in group II respectively. Qureshi et al[11]review comprised 27 studies (5427 participants) while the meta-analysis included 25 trials (5006 people). At T30, there was no significant difference in pain reduction between the IVP group and opioids (MD 0.13, 95% CI 1.49 to 1.22) or between IVP and NSAIDs (MD 0.27, 95% CI 1.0 to 1.54). There was also no difference at 60 minutes between the IVP group and the opioid group (MD 0.09, 95% CI 2.69 to 2.52) or between the IVP group and the NSAIDs (MD 0.51, 95% CI 0.11 to 0.91). For MD in pain scores, the quality of the evidence utilizing the Grading of Recommendations, Assessments, Development, and Evaluations technique was low.At T30, the IVP group required considerably more rescue analgesia than the NSAID group (risk ratio)with no difference found between the IVP group and the opioid group (RR: 1.07, 95% CI 0.67 to 1.70). AEs were 50% lower in the IVP group compared with the opioid group (RR: 0.50, 95% CI 0.40 to 0.62), whereas no difference was observed in the IVP group compared with the NSAID group (RR: 1.30, 95% CI 0.78 to 2.15). Sin B et al[12] in their study patients who received IV APAP experienced a significant reduction in pain levels in three of the 14 trials. The first trial discovered a substantial reduction in mean pain scores at 30 minutes after medication delivery when IV APAP was compared to IV morphine (4.7 2.3 vs. 2.9 2.2). In the second experiment, patients who received IV APAP reported lower pain scores (15 minutes after drug administration) (31.7 18 mm, 95% CI = 8.2 to 25.2 mm) than those who got IV morphine (48.3 14.1 mm, 95% CI = 8.2 to 25.2 mm). A third trial discovered a substantial reduction in mean pain scores (p = 0.005) when IV APAP was compared to intramuscular piroxicam 90 minutes after medication delivery. The limitation the study is small sample size.

Conclusion

Authors found that IVacetaminophen provided comparable degrees of pain alleviation to opiates/opioids post treatment in individuals coming to the ED with a variety of pain disorders.

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