

Efficacy and safety of Acetaminophen and Caffeine for the management of acute dental pain: A systematic review

Abou-Atme YS, Melis M, Zawawi KH. Saudi Dent J. 2019;31(4):417-423.



Background:

Acetaminophen is commonly recommended for the management of mild to moderate dental pain due to its safety at therapeutic doses and a favourable benefit / risk balance both in adults and children.

In cases of severe pain, non-steroidal anti-inflammatory drugs (NSAIDs) or opioids analgesics are suggested, either in combination with Acetaminophen or as a separate dose.

A review published in the Cochrane Database of Systematic Reviews indicated that addition of caffeine to a standard dose of commonly used analgesics like Acetaminophen provides additive analgesia with an increase in the proportion of patients who experience a good level of pain relief.

Study objective and methodology:

Since the use of NSAIDs and opioids have several restrictions, this systemic review was conducted to evaluate the efficacy and safety of Acetaminophen and Caffeine for the management of acute dental pain.

- Literature search was performed which evaluated randomized controlled trials (RCTs) on the use of Acetaminophen and Caffeine compared to placebo or compared to other medications for the treatment of dental pain.

Three double-blind RCTs were retrieved (Figure 1) and evaluated by using the Study Quality Assessment Tool of the National Institute for Health and Clinical Excellence.

Study 1:	Study 2:	Study 3:
<ul style="list-style-type: none"> Procedure: Surgical removal of impacted third molar Intervention: *APAP (500 mg) + Caffeine (65 mg) Vs. *APAP (500 mg) alone or placebo No. of patients enrolled (completed the study): 200 (173) 	<ul style="list-style-type: none"> Procedure: Periodontal surgery Intervention: *APAP (500 mg) + Caffeine (30 mg) Vs. Ibuprofen (400 mg) No. of patients enrolled (completed the study): 15 (15) 	<ul style="list-style-type: none"> Procedure: Implant surgery Intervention: *APAP (300 mg) + Caffeine (20 mg) Vs. *APAP (300 mg) + Codeine No. of patients enrolled (completed the study): 80 (76)

Figure 1: Types of the studies selected to review the efficacy and safety of Acetaminophen and caffeine for the management of acute dental pain.

Observations based on the above studies:

Studies	Study details	Reported outcomes
Laska et al.	<ul style="list-style-type: none"> All 173 subjects were interviewed at different time intervals for pain rating and relief. Pain intensity was scored as 0 = none, 1 = slight, 2 = moderate, 3 = severe. Percentage of pain relief was scored as 0 = none, 1 = 25%, 2 = 50%, 3 = 75%, 4 = 100%. 	<ul style="list-style-type: none"> Mean response for the Acetaminophen + Caffeine combination was superior to APAP alone. No reported side effects in either group.
Rashwan et al.	<ul style="list-style-type: none"> Each subject enrolled in the study received their first dose of medication immediately after surgery, and the second dose 8 h later. Efficacy was evaluated using a numeric rating scale (0-100) (NRS-101) and a verbal rating scale (0-4) (VRS-4). On day 1, the patients rated their pain on an hourly basis for 8 h after the procedure and later three times (morning, afternoon, night) on day 2. 	<ul style="list-style-type: none"> Acetaminophen + Caffeine group had significantly lower NRS 101 mean pain score than Ibuprofen after 1 & 2 hours. No significant difference based on VRS -4 between the two groups at all periods.
Samierad et al. study	<ul style="list-style-type: none"> Patients were randomly assigned to one dose of medication 30 min before and after surgery. 	<ul style="list-style-type: none"> No difference in pain intensity, as evaluated by a visual analog scale (VAS) 0 to 10 was found between the Acetaminophen and caffeine and the acetaminophen and codeine groups at 1-, 2-, 3- and 7 -day postoperative intervals. Only at 3 h, 6 h, and 12 h after surgery the pain intensity was lower for the acetaminophen and codeine group.

Summarised in figure-2: The exact mechanism of action of caffeine with regards to in enhancing the analgesic activity of pain medications is not well understood. However, multiple presumed mechanisms of actions attributed to its dysregulation of normal adenosine signalling are proposed.

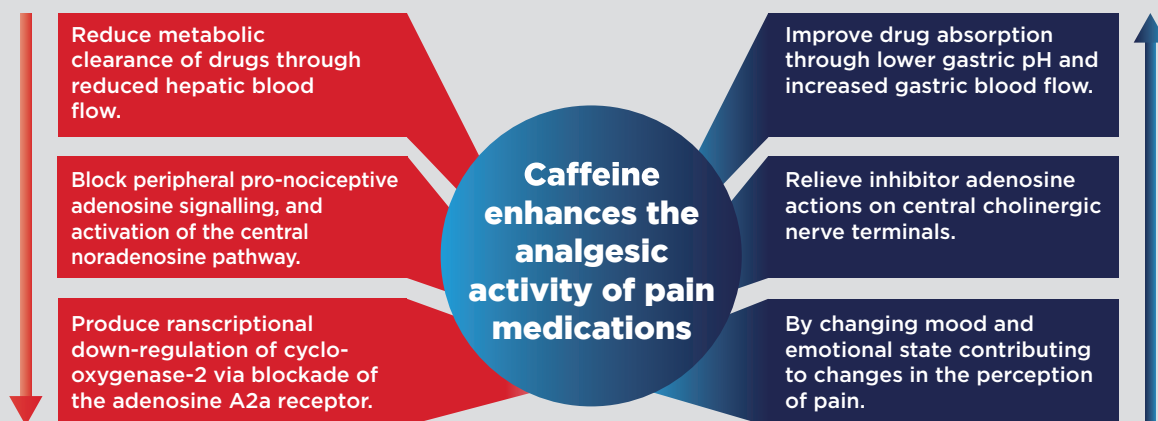


Figure 2: Proposed mechanisms by which caffeine may contribute to, or enhance the efficacy of other analgesics.

Key findings:

- The use of *APAP and Caffeine appears to be effective in achieving control of acute dental pain compared to placebo and other analgesic medications.
 - Acetaminophen + Caffeine combination is efficacious for dental pain.
 - Superior to Acetaminophen alone & similar to IBU & slightly inferior to APAP + codeine.
- Because of its established safety profile, use of Acetaminophen and Caffeine can be considered an efficacious alternative to NSAIDs and opioids, with minimal contraindications and side effects when used as per label and within the therapeutic dose.

Abbreviations: NSAIDs = non-steroidal anti-inflammatory drugs, RCT= randomized controlled trial, NRS = numeric rating scale, VRS = verbal rating scale, APAP= Acetaminophen



Panadol is approved for a range of pain types*

- ✓ Headache
- ✓ Migraine
- ✓ Dental Pain
- ✓ Dysmenorrhoea

