

## Prescribing Opioids in Dental Settings: A Concise Review

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### Abstract

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Opioids are strong analgesics available from ancient time. Natural as well as synthetic preparations are available in the market. It is generally prescribed by medical and dental practitioners to manage cancerous and non-cancerous pain. Besides providing pain relief, opioids produce side effects. In addition, chronic use of opioids leads to dependence and addiction. Lack of awareness or fear among dentists and patients may lead to over/under prescription of these medications. A step up approach with supplemented and as required opioid medication may achieve adequate pain control. A screening of potential future abuse and misuse is required prior to the commencement of opioid administration. Education and counseling further mitigates opioid risks and solves problems of excess medication. A brief review of opioid prescription practice in dental practice is presented here.

### Introduction

The use of opioids has been known since ancient period, initially as euphoriant and later as pain remedy.<sup>1</sup> Opioids are being used for both cancerous and non-cancerous pain in adults and children.<sup>[2,3]</sup> World Health Organization has proposed analgesic pain ladder for cancer pain in 1986.<sup>4</sup> While use of opioid in cancer pain is being universally adopted; its administration for non-cancer pain has been controversial and debatable.<sup>[5,6]</sup> During the past few years a noticeable rise in prescription of opioid has happened, called as 'Opioid Epidemic'.<sup>[7,8,9]</sup> Dental practitioners routinely encounter patients for medical and surgical intervention, requiring potent analgesics. Assessment of requirement and prescription of opioids, in these patients is a challenge to a dental practitioner.<sup>[10,11]</sup> Lack of awareness of comprehensive guidelines and monitoring services may further complicate the situation, leaving the dentist over or under prescribing these medications.

### Pharmacology

Opiates are naturally occurring alkaloids, derived from opium poppy (*Papaver somniferum*), which is cultivated as agricultural crop. Morphine is a potent analgesic, and predominant natural alkaloid, extracted from poppy plant. Other products derived are thebaine, codeine, papaverine and noscapine. While semi-synthetic opioids are manufactured mainly from natural substance like morphine and codeine, synthetic opioids are also available in market.<sup>1</sup>

There are several types of receptors: MOP, KOP, DOP and NOP, located in various sites of the body, on which opioids act.<sup>12</sup> Opioids may interact with these receptors selectively or non-selectively, producing different effects including analgesia.<sup>1</sup> MOP is mostly involved with analgesia, respiratory depression, constipation, tolerance and dependence, and endocrine and immunological effects. With some opioids KOP mediate analgesic effects.<sup>13</sup> Tolerance and dependence with opioid develop after prolonged period of use. While the reason for physical dependence is altered physiological state, tolerance may be genetic, pharmacokinetic or pharmacodynamic.<sup>14</sup> Even after use of receptor selective opioids, undesirable side effects (nausea, vomiting, constipation, sedation, cognitive impairment, myoclonus, pruritus and hypogonadism) present, requiring pharmacological and non-pharmacological treatments.<sup>15</sup> Incomplete cross tolerance between opioids require careful dose conversion while switching from one to another.<sup>13</sup>

Opioid antagonists are competitive in nature, producing inverse effects of opioids. Opioid agonist antagonists have agonist effect on a receptor along with antagonist effect on another receptor.<sup>16</sup>

### Opioids in dental practice

Analgesics are used in dental practices for acute or chronic pain of malignant or non malignant origin. Pulpal and periapical diseases are common in dental practices. Although the absolute treatment of acute dental pain lies with eradication of underlying disease process, perioperative period requires analgesic use. Dental extraction, endodontic therapy and scaling are common procedures requiring analgesic use.<sup>17</sup> Chronic orofacial pain having undefined origin, may require longer, complex and multidisciplinary treatment approach.<sup>[18,19]</sup>

The assessment of intensity of pain is performed differently for acute and chronic pain.<sup>20</sup> Visual analogue scale (VAS) and numeric rating scale (NRS) is used for acute pain after dental surgeries.<sup>21</sup> Measurement of pain intensity may be difficult in children, for this face pain scale is utilized.<sup>22</sup> Chronic pain measurement tools consists of Brief Pain Inventory, McGill Pain Questionnaire and the short-form McGill Pain Questionnaire, and Massachusetts General Hospital Pain Center's Pain Assessment Form.<sup>20</sup>

The first line of management for dental pain of mild to moderate nature, is acetaminophen, due to its high benefit risk ratio.<sup>23</sup> Non-steroidal anti-inflammatory drugs (NSAIDs) are prescribed alone or combined with acetaminophen in patients, who do not get adequate relief after acetaminophen therapy.<sup>24</sup> Opioids may be indicated in patients if acetaminophen and NSAIDs may not alone be sufficient. Pain of severe nature, maxillofacial surgery, third molar extraction, NSAIDs allergy or side effects may require opioid prescription.<sup>[17,23-25]</sup> Breakthrough pain, non-responsive to acetaminophen and NSAIDs, require short duration of opioid medication.<sup>25</sup>

A step up rather than step down approach in prescription would avoid unnecessary use of opioids and its side effects.<sup>25,26</sup> Non-opioids (acetaminophen or NSAIDs) are prescribed at first step for mild to moderate pain, and depending up on adequacy of pain relief an opioid is added at second step.<sup>25</sup> This multimodal approach helps in reducing number of opioid prescription. Multiple combination analgesics are available in market and have advantage of additive action and satisfactory pain control.<sup>27</sup> Drug overdose with acetaminophen and side effects with NSAIDs may limit its use as fixed dose combination.<sup>28</sup> Prescribing combination medication only for acute pain and separating the prescription of opioids and non-opioids for chronic cases may avoid this problem.<sup>27</sup>

Congenital birth defect, respiratory depression and opioid withdrawal have been reported, when these drugs are administered during pregnancy.<sup>29</sup> A cautious approach should be maintained with prescription of opioids to women of child bearing age. Pediatric patients may receive opioids apart from non-opioid, as and when required, and for breakthrough pain.<sup>30</sup> Dose calculation should be careful to prevent respiratory depression.

### **Abuse and misuse**

The use of opioids for pain management for non-cancer pain can result in dependence and misuse.<sup>31</sup> Prediction of future abuse of prescription opioid may be difficult; some patients are possibly more at risk as compared to others.<sup>32</sup> Multiple questionnaires have been developed as screening instruments.<sup>[32-34]</sup> History of drug abuse, young age, thrill seeking behavior, coexisting psychiatric illness, legal problems, criminal activity, smoking and alcohol intake are risk factors for opioid abuse.<sup>35</sup> Physical examination, toxicology and psychiatric assessment are required prior to commencement of opioid therapy. Legal status of opioid medication varies from place to place. Dentist should adhere to local laws related to opioid prescription.<sup>36</sup> The prescribed medicine may be diverted for non-medical use.<sup>[36,37]</sup> Opioid abuse and addiction in dental practice may be limited for the reason that the drug is prescribed for short period of time, and generally mild opioids are prescribed in these cases. Further, prescription drug monitoring programs should be embedded in dental practice to improve the quality of drug prescription.<sup>[38,39,40]</sup>

### **Education and counseling**

Education and knowledge is an important part of opioid prescription and helps in risk mitigation. Dentists, paramedical staffs and patients should be well informed about indications, side effects and abuse potentials of opioids.<sup>[36,41]</sup> Patient communication about alternatives to opioids is equally significant. Opioid overdose is one of the complications, which leads to fatality. Recognizing sign and symptoms of overdose is of great importance to patients and dentists.<sup>42</sup>

Dental problems are generally of short period resulting in problem of leftover opioid medications. The patients should be instructed about safe storage of opioids, and safe disposal practice of excessive medicine should be implemented whenever it is no longer required.<sup>[36,43,44]</sup> Prescription of excessive analgesics for minor procedures should be discouraged.<sup>44</sup>

## Discontinuation of opioid therapy

Patients taking opioid medication for short duration (< 1 week) can stop taking drugs abruptly. While patients with longer duration of opioid consumption may develop dependence and require tapering of medication gradually.<sup>36</sup> Opioid should also be discontinued if treatment goal is not achieved, severe adverse effects are present, or if there are signs of drugs abuse and diversion.<sup>45</sup> If signs of addiction or tolerance are present, a substance abuse or addiction specialist should be consulted.<sup>46</sup>

## Conclusion

Opioid, being strong analgesic, is required by some of the patients presenting for dental procedures and surgeries. Opioid pharmacology is complex; it involves multiples drugs acting on different receptors, and produces effects depending upon agonistic and agonistic properties. A structured approach in prescription reduces opioid side effects, and leads to less dependence and addiction. Further, by preventing over/under prescription, it provides better pain management experience to patients. Non-opioid prescription first then addition of opioid is generally followed for severe and breakthrough pain. Mild opioid use for short period of time limits abuse and misuse of opioids. Education and counseling focuses on side effects and abuse potential, and is an important component of opioid prescription.

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