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KNOWLEDGE AMONG DENTISTS ABOUT THE USAGE OF OPIOID ANALGESICS IN DENTAL PRACTICE

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ABSTRACT:

Pain management is very common in the dental practice. Analgesics are the best option for treating pain. Conventional analgesics are classified as opioids and nonopioids, but the older terms ''narcotic'' and ''nonnarcotic'' continue to be used interchangeably. Dependence and tolerance are well-known features with regular use of opioid analgesics although this should not necessarily inhibit prescribing in palliative care. The dentist should have a clear knowledge in prescribing opioid drugs to the patients. The aim of the study was to assess dentists regarding knowledge, attitude and opinion on prescribing opioid analgesics in dental practice.A close ended questionnaire comprising 10 questions regarding knowledge, precautionary measure, indication, guidelines in prescribing opioid analgesics in dental practice was distributed to 100 dental practitioners. Data will be tabulated and analysed by

computing the percentage response for each question. The results of this study showed that the majority of the dental practitioners (83%) were aware and some of them (17%) were unaware regarding the usage of opioid analgesics in dental practice. Most of the respondents in this study knew the background of opioid drugs, indication, contraindication and their usage in dental practice. However, dentists should be cautious in prescribing any form of drugs to the patient.

INTRODUCTION

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. It is not just a physical sensation. It is influenced by attitudes, personality, beliefs, and social factors, and can affect mental and emotional wellbeing. It has accompanied humans since their appearance on earth(Krasniqi and Daci, 2017) Pain is a subjective symptom signaling a requirement to act urgently and is usually associated with other subjective feelings such as anger, anxiety and discomfort. The expression of nature and intensity of pain is a subject of different patient-related characteristics. There are several patient factors having an impact in the patient's interpretation of pain, such as age, gender, physiological factors, neuropathic and other disease, drug abuse history, and psychological profile of individual humans(Fainsinger*et al.*, 2010; Krasniqi and Daci, 2017). It is a leading cause of morbidity worldwide justifying the rapidly growing demand for safe and effective pain management(Fainsinger*et al.*, 2010) . Pain has been consistently identified as the most common reason for seeking dental attention and an inevitable sequela of some of the dental treatment because it is a feature of inflammatory oral diseases and infection, which are the predominant oral diseases affecting mankind(Hargreaves and Abbott, 2005; Azodo and Umoh, 2013).

Dental pain or toothache is simply defined as an uncomfortable sensation related to the teeth or surrounding structures. It is a common subjective complaint of dental patients following the different interventional procedures and dental diseases. Dental pain presents one of the most common causes (approximately 12%) of patients seeking emergency treatment in dental healthcare in the United States(Anderson and Thomas, 2003). Odontogenic pain is a complex cascade process initiated from dental tissue damage and accompanied with heterogeneous neuronal stimuli as a consequence of neurovascular, neuroinflammation and morphologic reactions(Kissin, 2010). Pain control is therefore an essential service and duty of dentists, and the appropriate selection and use of the analgesics will facilitate the delivery of this service with the optimal safety and efficacy(Jeske, 2005; Azodo and Umoh, 2013).

Analgesics are considered one of the most important drugs groups in dental practice considering the clinical efficacy, cost-effectiveness, prescription rate, and safety profile of the drug group. According to this level of importance in dental clinical practice, there are different approaches to develop treatment algorithms and guidelines for treating dental pain in order to rationalize the use of analgesics. The management of dental pain in clinical practice is a complex part of dental care and requires high-level knowledge of analgesic

pharmacology and implementing the standards of rational use(Krasniqi and Daci, 2017).

In order to prevent patient pain, the clinician may choose from opioid and nonopioid analgesics. Dental pain due to periapical and pulpal disease is considered as the most frequent and it is a warning sign and subjective perception of altered periapical tissue and pulpo dentinal tissue. These two can be differentiated from one another and this perception has an impact on the appropriate selection of analgesic drugs. According to the clinical manifestation of dental pain, it can be classified as acute or chronic and with or without malignant disease. Acute pain lasts from several hours to a number of days and is usually a reflection symptom of several clinical conditions such as dental trauma, inflammatory conditions of dental and other related tissue structures, including the temporomandibular and masticatory muscle damages. Chronic pain can be present for several months and, if primary dental care is not applied, it can last for years. Dental referred pain is a complex clinical phenomenon, which requires a highly experienced dentist to diagnose and locate the primary source of pain(Murray, 2009). The majority of clinical indications for analgesic prescriptions are related to treatment of acute and chronic dental pain, adjunctive intraoperative and postoperative pain(Thomas, 2010).

OPIOID ANALGESICS IN DENTAL PRACTICE

Opioid also known as narcotics can be used to treat moderate to severe acute pain. These include drugs such as morphine, oxycodone, hydrocodone, and codeine etc.Opioid use has increased in dental practice in the last few decades. But, when drug therapy is indicated, opioid analgesics are not usually the first choice, however they should be considered as an alternative in specific cases(Derry, Moore and McQuay, 2010; Lino*et al.*, 2019) These include situations where acetaminophen or a nonsteroidal anti-inflammatory drug (NSAID's) are contraindicated. The World Health Organisation reinforces that opioid analgesics are an additional medication to other first-choice non-opioids, in cases where they do not act enough(World Health Organization, 2012). Opioids do not have anti-inflammatory properties so non-opioid analgesics (e.g., NSAIDs) can be a better first choice for pain relief(Moore *et al.*, 2016). Studies also report an increased prevalence of opioid addiction and a parallel increase in opioid overdose deaths(Morin *et al.*, 2017). Opioids act as agonists at opioid receptors, altering the nervous system's response to painful stimuli. They can be full agonists, partial agonists, or mixed agonist/antagonists(Dionne, Gordon and Moore, 2016). The mechanism of action of opioids is not completely known, however specific opioid receptors have been identified in the brain and spinal cord that are thought to play a role(American Dental Association, 2018).

Practitioners are often concerned with the potential for addiction, which may limit prescribing and use, leading to inadequate management of pain(Goodman, 2008). It can be attributed to confusion regarding the concepts of drug addiction and drug dependence. Patients consuming opioids regularly for more than a week may develop some degree of dependence. This may require gradual tapering of the dosage to avoid withdrawal symptoms.

However, drugs do not produce addiction. It is a compulsive pattern of behavior in which an individual continues to seek the drug for effects they perceive as pleasurable and not for legitimate medical conditions. Addictive behavior is a psychiatric condition that can be reinforced by a particular drug, but it is not a pharmacodynamic property. Opioids must be prescribed cautiously for patients who demonstrate addictive personality. Despite common misconceptions, all opioids provide the same degree of pain relief provided that they are prescribed at equal doses(Becker and Phero, 2005). Adverse effects commonly associated with opioids include sedation, pruritus, sweating, dizziness, nausea, vomiting, constipation, and respiratory depression. Prescription opioids are meant to be used to treat acute pain such as recovering from injury or post-surgery, chronic pain, active-phase cancer treatment, palliative care and end-of-life care In addition, prescription opioids contain a black box warning stating the risks of addiction, abuse and misuse, respiratory depression, accidental ingestion, neonatal opioid withdrawal syndrome due to prolonged use during pregnancy, interactions with cytochrome P450 3A4 inhibitors, and dangers of concomitant use with benzodiazepines or other CNS depressants(American Dental Association, 2018). Rational drug therapy should aim at selecting drugs for pain-control or pain-relief while minimising possible adverse effects. Some healthcare systems in the world have databases that enable monitoring and help in comparison between various pharmaceutical drugs usage. These drug-dispensing data enable the identification for the pattern of drug prescription adopted by healthcare professionals(Lino*et al.*, 2019).

Previously our department has published extensive research on various aspects of prosthetic dentistry (‘Evaluation of Corrosive Behavior of Four Nickel–chromium Alloys in Artificial Saliva by Cyclic Polarization Test:An in vitro Study’, 2017; Ganapathy, Kannan and Venugopalan, 2017; Jain, 2017a, 2017b; Ranganathan, Ganapathy and Jain, 2017; Arига*et al.*, 2018; Gupta, Ariga and Deogade, 2018; Anbu*et al.*, 2019; Ashok and Ganapathy, 2019; Duraisamy*et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019), this vast research experience has inspired us to research about the knowledge among dentists about the usage of opioid analgesics in dental practice. Therefore, the aim of this present survey was to assess the awareness and knowledge among dentists on the use of opioid analgesics in dental practice.

MATERIALS AND METHOD

A questionnaire consisting of 10 multiple choice/answer formats was designed for the dentists regarding their knowledge, opinion, usage, precaution on the use of opioids in dental practice. The survey was conducted among 100 dental practitioners from Saveetha Dental College and Hospitals. The survey also asked the clinicians to provide their demographic data such as the name, age, sex and year of study. Data were analysed in percentage by computing the responses for each question and tabulation of results were done.

RESULTS AND DISCUSSION

From table 1, in this study it was found that 83% of dental practitioners have agreed that opioids are used for treating moderate to severe pain. 76% of the respondents accepted that NSAIDS should be avoided in patients taking

warfarin. 72% of participants answered that opioids have the risk of addiction. Hydrocodone was the most commonly used opioid analgesic (60%) followed by oxycodone (13%), methadone(9%), morphine(8%), propoxyphene(6%) and codeine (4%). 42% of practitioners are prescribing opioids whenever required and 56% never prescribed opioids in their dental practice. 51% of practitioners prescribe opioids for major surgical procedures involving soft tissue and bone, 46% when a patient fails to respond to NSAIDS and 3% after routine dental procedure. 41% of participants thought sedation was the most common side effect followed by dizziness(16%), nausea(13%), vomiting(12%), tolerance(10%), respiratory depression(8%). 79% of practitioners agreed that NSAIDS are beneficial comparing opioids. 69% of dental practitioners accepted that opioids increase the therapeutic effect when combined with other drugs and 21% think it alters the therapeutic effect and 10% thought combination decreases the therapeutic effect of the drug. Around 71 % of practitioners follow ADA and CDC guidelines for prescribing opioid analgesics.

Table 1: Responses of the practitioners to the questionnaire.

QUESTIONS	MAXIMUM RESPONSE	MINIMUM RESPONSE
1. Do you think opioids are used for treating moderate to severe pain?	Yes- 83%	No-17%
2. Do you think NSAIDS should be avoided in patients taking warfarin?	Yes-76%	No-24%
3. Do you think opioids have the risk of addiction?	Yes-72%	No-28%
4. Which is the most commonly used opioid analgesic?	Hydrocodone-60%	Codeine-4%
5. Do you prescribe opioid analgesics in your practice?	Yes-44%	No-56%
6. Opioid analgesics are prescribed mostly when?	Major surgical procedures-51%	Following routine dental procedures-3%
7. What is the most common side effect of opioid analgesic?	Sedation-41%	Respiratory depression-8%
8. Do you think NSAIDS are more beneficial when compared with opiods?	Yes-79%	No-21%

9. What happens when opioids are used in combination with NSAIDS?	Increases the therapeutic effect-69%	Decreases the therapeutic effect-10%
10. Do you follow American Dental Association (ADA) and Centers for Disease control and Prevention (CDC) guidelines for prescribing opioids?	Yes-71%	No-29%

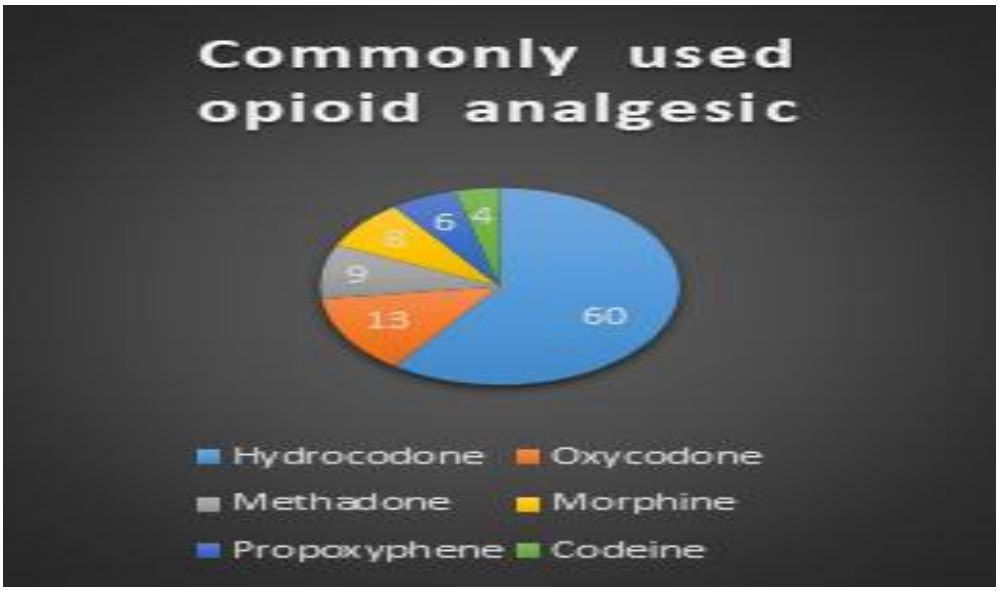

Figure 1: Pie chart representing the commonly used opioid analgesics. Hydrocodone (60%) was the most commonly used opioid analgesic followed by oxycodone (13%), methadone(9%), morphine(8%), propoxyphene(6%) and codeine (4%).

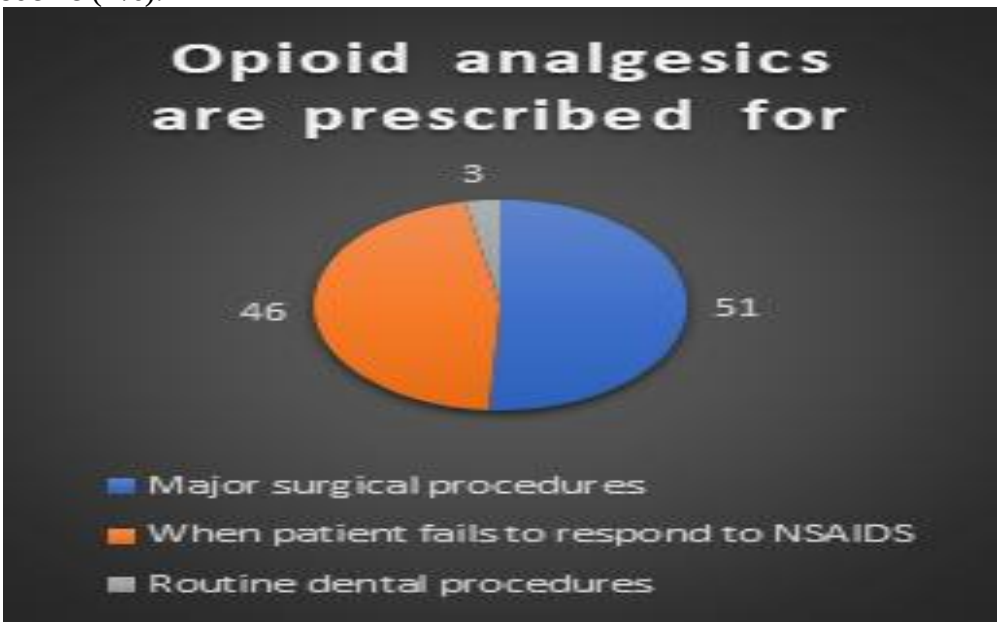

Figure 2: Pie chart showing the reason for prescribing opioid analgesic. Opioids are prescribed mostly for major surgical procedures (51%) followed by when a patient fails to respond to NSAIDS (46%).

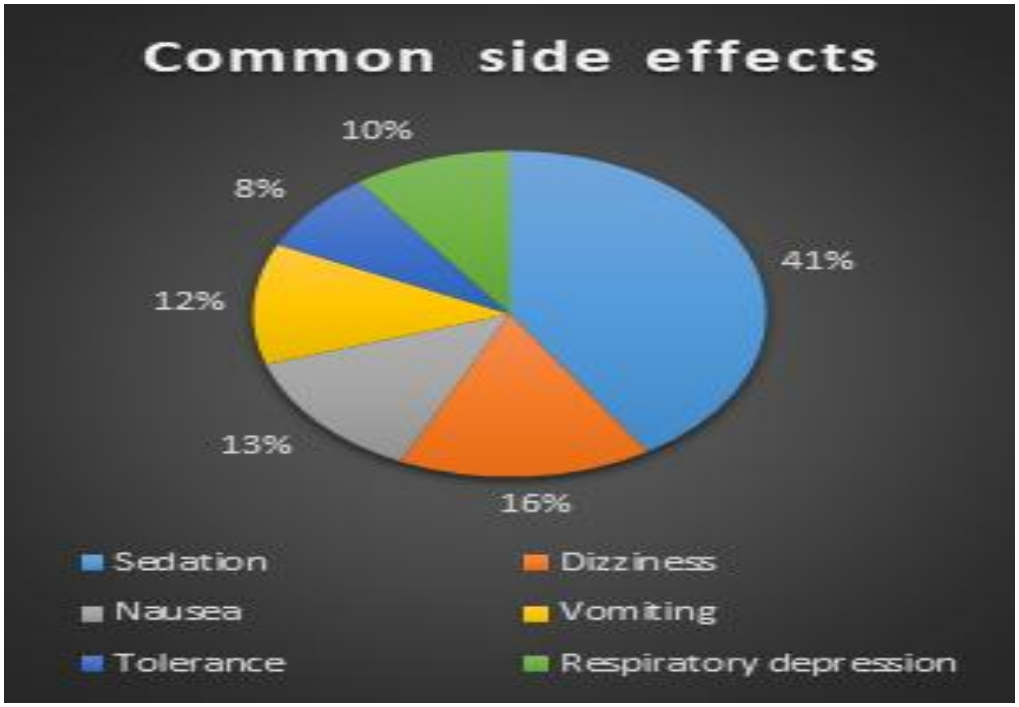

Figure 3: Pie chart showing the frequency of side effects of opioid analgesic. Sedation was the most common side effect (41%) followed by dizziness(16%), nausea(13%), vomiting(12%), tolerance(10%), respiratory depression(8%).

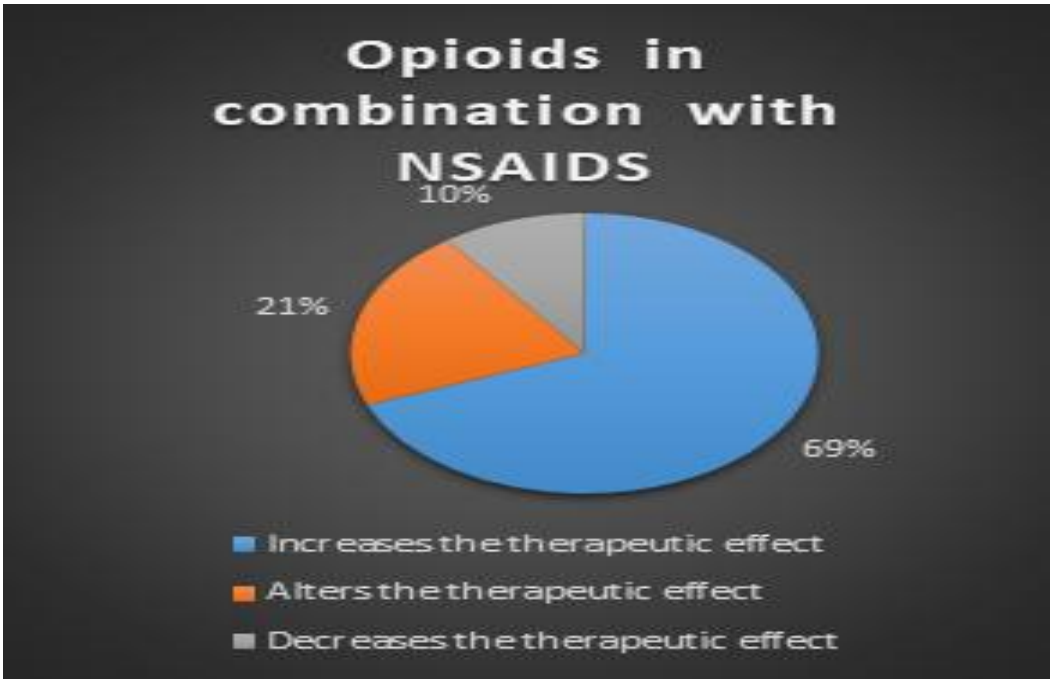

Figure 4: Pie chart showing the effect of combining opioids with NSAIDS. Combination increases the therapeutic effect (69%) followed by alters the therapeutic effect (21%) and decreases the therapeutic effect (10%).

The awareness and knowledge among dentists on the use of opioid analgesic in dental practice was well known and documented. The results of this present study revealed that most dentists have clear cut knowledge regarding the effect of opioid analgesics and its proper usage and limitations in dental practice. Most of the practitioners avoid NSAIDS in patients taking warfarin. Similar results were obtained in the study done by Krasniqi et al., which stated that NSAIDs display major interactions when used alongside anticoagulant and antiplatelet effects of warfarin and clopidogrel, which results in enhancement of their effects and increased risk of bleeding(Krasniqi and Daci, 2017). This is contraindicated in a study done by Joseph et al.,, which concluded that so far no other NSAIDs have been shown to have a significant effect on warfarin metabolism.(J W O'Callaghan, R N Thompson, A S Russell, 1984)

And also in this study, most of the practitioners thought opioid causes addiction and similar results were obtained in a study which concluded that effective narcotic analgesics were available but seldom used, and that doctors were ignoring pain management because of an irrational fear of addiction(Phillips, 2000). Robinson stated that recent guidelines have emphasized the need to initiate, structure and monitor therapy in a manner that both optimizes the positive outcomes of opioid therapy and minimize the risks associated with abuse, addiction and diversion.(Robinson, 1993)

In this study, 60% of practitioners agreed that hydrocodone was the commonly used opioid. This is similar to the study which concluded that Hydrocodone-based opioids accounted for most (62.3%) of US dental opioid prescribing, followed by codeine (23.2%), oxycodone (9.1%), and tramadol (4.8%).(Suda*et al.*, 2019)

In the current study, 51% practitioners agreed that they require opioid analgesics for major procedures. Similar study by Raymond et al., stated that procedures like orthognathic procedures, facial trauma, tumor resection which cannot be managed by NSAID alone require opioid analgesics. (Raymond A. Dionne, Gary Warburton, Asma Khan, 2018)

In this study, 79% of dental practitioners prescribe NSAIDS over opioid analgesics. This is similar to the ADA statement: "Dentists should consider nonsteroidal anti-inflammatory analgesics as the first-line therapy for acute pain management"(American Dental Association, 2018) It is controversial that a study in the United States which shown that dentists recommend and prescribe opioids over nonsteroidal anti-inflammatory drugs, in greater quantities, and for longer than necessary to control dental pain(McCauley *et al.*, 2016)

In this study, 69% practitioners accepted that opioids increase the therapeutic effect when used in combination with NSAIDS. It is similar to a recent systematic overview in JADA , the combination of 400 mg ibuprofen with

1,000 mg acetaminophen was more effective than any opioid-containing regimen and was also associated with a lower risk of adverse events(Moore *et al.*, 2018). It is controversial to a study done by Mario I. Ortiz et al., which concluded that not all the opioid-NSAID, opioid-acetaminophen, or NSAID-acetaminophen combinations are clinically successful in all cases. The association of weak opioids, such as dextropropoxyphene, to acetaminophen does not significantly increase pain relief compared to acetaminophen alone(Ortiz *et al.*, 2012).

This survey certainly has its own limitations. As the subjects were asked regarding their experiences in their practice over a wide frame of time, memory and subjective bias could have been possible and also this study was done in a small population. Hence, furthermore studies should be done among dentists with a larger population to assess the knowledge about the mechanism, benefits, combination with other drugs and risks of the opioid analgesic in the management of pain in future.

CONCLUSION

Majority of the dental practitioners were aware regarding the use of opioid analgesics in dental practice. It is always better to avoid opioid analgesics in a dental setup unless and until its usage is required or when other drugs fail to elicit its potential effect or when increased efficiency is required.

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CONFLICT OF INTEREST

The authors declare that there were no conflicts of interest in the present study.

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