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The Role of Antihistamines in Dental Sedation: Perceptions and Practices among Dentists: A Cross-sectional Study

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ABSTRACT

Objectives: This study aims to explore the prevalence, reasons for use, dosage adjustments, and dentists' perceptions regarding antihistamines in dental sedation.

Methods: A cross-sectional survey was conducted among 150 dentists. Participants were asked about their usage of antihistamines for sedation, the most commonly used medications, reasons for their use, and any adjustments made to dosages based on patient factors. Additionally, the study explored their opinions on whether antihistamines could replace benzodiazepines in certain cases.

Results: Of the respondents, 46.7% reported using antihistamines, with diphenhydramine (71.4%) being the most common, followed by hydroxyzine (50.0%) and promethazine (40.0%). The primary reasons for use were preoperative anxiety control (78.6%), salivation reduction (54.3%), and adjunct sedation (42.9%). Regarding dosage adjustments, 44.7% of dentists modified doses based on patient factors. A significant difference in dosage adjustments was observed between private- and hospital-based dentists ($p = 0.03$). When asked about replacing benzodiazepines, 40.0% agreed, 26.7% were unsure, and 33.3% disagreed.

Conclusions: Antihistamines, particularly diphenhydramine, are commonly used in dental sedation for anxiety control and salivation reduction. However, there is a variability in clinical practices, with some dentists modifying dosages based on patient factors. The possibility of replacing benzodiazepines with antihistamines remains a topic of debate among practitioners. Further research is needed to establish clearer guidelines on the safety and efficacy of antihistamines as sedatives in dental practice.

Keywords: Antihistamines, Sedation, Medications, Diphenhydramine, Dental practice.

1. Introduction

Dental anxiety and fear remain significant barriers to receiving dental care, often leading to avoidance behaviors that compromise oral health (1). Effective sedation techniques are essential for improving patient comfort and cooperation, particularly among highly anxious individuals or those undergoing lengthy procedures (2). While benzodiazepines, opioids, and nitrous oxide are the primary pharmacological agents for sedation, antihistamines have gained attention as potential alternatives or adjuncts due to their sedative, anxiolytic, and antiemetic properties (3,4).

First-generation H1 receptor antagonists, such as diphenhydramine and hydroxyzine, are known to cross the blood-brain barrier and inhibit histaminergic neurotransmission, leading to mild sedation, muscle relaxation, and reduced anxiety (5). Additionally, their anticholinergic effects help reduce salivary secretion, which can enhance the operative field during dental procedures (6). Their antiemetic properties make them

particularly beneficial for patients prone to nausea and vomiting during sedation (7).

Despite these advantages, antihistamines remain underutilized in dental sedation. Concerns about adverse effects, such as drowsiness, dry mouth, dizziness, and potential drug interactions, have contributed to their limited clinical use (8). Furthermore, a lack of awareness and standardized protocols among dentists has led to inconsistencies in their application (9).

Given the increasing interest in alternative sedation methods, this study aims to assess dentists' knowledge, attitudes, and clinical practices regarding antihistamine use in sedation dentistry. By evaluating perceptions and identifying potential barriers, this research seeks to provide insights that may contribute to expanding sedation options, optimizing patient management strategies, and informing future guidelines in dental sedation (2).

2. Materials and Methods

2.1 Study Design and Setting

This study was designed as a cross-sectional survey to assess the knowledge, attitudes, and clinical practices of dentists regarding the use of antihistamines in dental sedation. The study was conducted from July 2023 to August 2024 across various regions in Libya.

2.2 Inclusion and Exclusion Criteria

Inclusion criteria required participants to be actively practicing dentists. The study included both dentists who practiced sedation and those who did not, to assess their percentage, perceptions, and reasons for not utilizing sedation. Dentists who did not practice sedation were categorized separately, allowing for comparative analysis. Participants who submitted incomplete survey responses were excluded from the study.

2.3 Data Collection Instrument

A structured questionnaire was developed to collect information on dentists' demographic characteristics, knowledge, attitudes, and clinical practices concerning antihistamine use in dental sedation. The questionnaire was validated by a panel of dental experts for content, accuracy and clarity before distribution. To ensure reliability, a pilot study was conducted with a small sample of dentists (n = 10), and the questionnaire showed good internal consistency (Cronbach's alpha = 0.85). The questionnaire consisted of the following sections:

1. **Demographic Information**: age, gender, years of experience, type of practice (private, academic, or hospital-based).
2. **Knowledge Assessment**: awareness of the pharmacological properties of antihistamines, their role in sedation, and potential side effects.
3. **Attitudes**: perceptions regarding the safety, efficacy, and preferred indications for antihistamine use in sedation.
4. **Clinical Practices**: frequency of antihistamine use, preferred agents, and dosage adjustments based on patient factors.

2.4 Data Collection Procedure

To maximize response rates, the survey was distributed using both online (Google Forms, e-mail) and paper-based methods. Participants were provided with an informed consent statement outlining the purpose of the study, confidentiality measures, and the voluntary nature of participation. Responses were collected between July 2023 and August 2024. A total of 153 responses were initially received; after data cleaning, 150 valid responses were included in the analysis.

2.5 Ethical Considerations

This study was approved by the Ethics Committee at Sirt University. Written informed consent was obtained from all participants before data collection. All responses were anonymized, and participation was strictly voluntary. Participants had the option to withdraw from the study at any stage without any consequences.

2.6 Data Analysis

The collected data was entered into SPSS, version 28 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. Inferential statistics, such as chi-square tests (χ^2), odds ratios (ORs), and Pearson's correlation coefficients (r), were employed to assess associations and relationships. A p-value of <0.05 was considered statistically significant.

3. Results

3.1 Demographic Characteristics of Participants

A total of 150 dentists participated in the study (85.7% response rate). Most of them were males and

worked in private clinics. A significant association was found between years of experience and knowledge of antihistamine use in sedation (χ^2 = 12.45, p = 0.002) (Table 1).

Table 1: Demographic distribution of the participants

Variable	Category	N	%
Gender	Male	90	60.0
	Female	60	40.0
Age Group (years)	20–29	30	20.0
	30–39	65	43.3
	40–49	45	30.0
Years of Experience	<5 years	45	30.0
	6–10 years	35	23.3
	11–20 years	40	26.7
	>20 years	30	20.0
Practice Setting	Private Clinics	80	53.3
	Academic Institutions	45	30.0
	Hospital-based	25	16.7
Statistical Test	Years of experience *vs.* knowledge of antihistamine use in sedation	χ^2 = 12.45, p = 0.002	

3.2 Knowledge about Antihistamines in Dental Sedation

Most participants (68.0%) were aware of antihistamines' sedative use, with diphenhydramine being the most recognized agent. While 65.3% correctly identified sedation as a pharmacological effect, 40.0% were uncertain about its anxiolytic properties. Drowsiness, dry mouth, and dizziness were the most commonly recognized adverse effects. Dentists with >10 years of were 2.3 times more likely to correctly identify antihistamine side effects compared to those with ≤5 years (OR = 2.3, 95%, CI: 1.4–3.8, p = 0.001) (Figure 1).

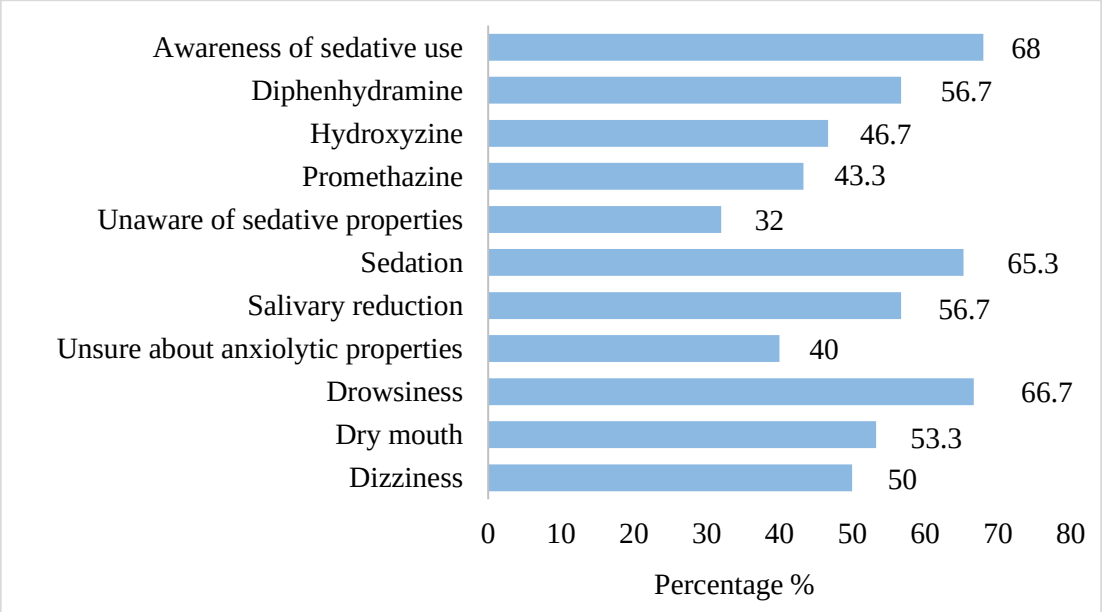

Figure 1. Knowledge about antihistamines in dental sedation

3.3 Attitudes toward Antihistamine Use in Sedation

The majority of respondents (n=92, 61.3%) believed that antihistamines are somewhat effective as sedatives, while 40 (26.7%) rated them as very effective. However, 18 (12.0%) were uncertain about their efficacy.

Regarding their routine use in sedation, 78 (52.0%) supported use in selected cases, whereas 55 (36.7%) opposed routine use, citing safety concerns. A smaller group (17 participants, 11.3%) reported routine use of sedation without restrictions. The main concerns were side effects (n=88, 58.7%), lack of clinical guidelines (n=72, 48.0%), and insufficient training (n=60, 40.0%).

A significant correlation was found between level of experience and positive attitudes toward antihistamines ($r = 0.42$, $p < 0.001$), as shown in Table 2.

Table 2: Attitudes toward antihistamine use in sedation

Category	Number (n)	Percentage (%)
Effectiveness of Antihistamines as Sedatives		
Somewhat effective	92	61.3%
Very effective	40	26.7%
Uncertain	18	12.0%
Routine Use in Sedation		
Supporting use in selected cases	78	52.0%
Opposing routine use	55	36.7%
Main Concerns Regarding Use		
Side effects	88	58.7%
Lack of clinical guidelines	72	48.0%
Insufficient training	60	40.0%
Correlation between Experience and Positive Attitudes	$r = 0.42$	$p < 0.001$

3.4 Clinical Practices Related to Antihistamine Use

A total of 70 dentists (46.7%) reported using antihistamines for sedation, while 80 (53.3%) had never used them. Among those used, diphenhydramine (n=50, 71.4%) was the most common, followed by hydroxyzine (n = 35, 50.0%) and promethazine (n=28, 40.0%).

The primary reasons for use were pre-operative anxiety control (n=55, 78.6%), salivation reduction (n=38, 54.3%), and adjunct sedation (n=30, 42.9%).

Regarding dosage adjustments, 67 dentists (44.7%) modified doses based on patient factors, while 83 (55.3%) did not. Hospital-based dentists were significantly more likely to adjust doses than private dentists ($p = 0.03$).

Finally, when asked whether antihistamines could replace benzodiazepines in certain cases, 60 (40.0%) agreed, 40 (26.7%) were unsure, and 50 (33.3%) disagreed (Table 3).

Table 3: Clinical practices related to antihistamine use

Category	Frequency (n)	Percentage (%)
Dentists using antihistamines	70	46.7%
Dentists not using antihistamines	80	53.3%
Most common antihistamine used		
- Diphenhydramine	50	71.4%
- Hydroxyzine	35	50.0%
- Promethazine	28	40.0%
Primary reasons for use		
- Pre-operative anxiety control	55	78.6%
- Salivation reduction	38	54.3%
- Adjunct sedation	30	42.9%

Modified doses based on patient factors	67	44.7%
Did not modify doses	83	55.3%
Dosage adjustments		
- Private dentists	27	27%
- Hospital-based dentists	40	80%
Antihistamines replacing benzodiazepines		
- Agreed	60	40.0%
- Unsure	40	26.7%
- Disagreed	50	33.3%

4. Discussion

This study aimed to explore the use of antihistamines as a sedative option among dentists, focusing on their prevalence, reasons for use, dosage adjustments, and perceptions regarding their potential to replace benzodiazepines. The results revealed that a substantial proportion of dentists (46.7%) reported using antihistamines, with diphenhydramine being the most commonly used drug. This aligns with findings from previous studies, where diphenhydramine was found to be the most frequently utilized antihistamine for sedation due to its antihistaminic and sedative properties (10). Hydroxyzine and promethazine, though less frequently used, were also identified as alternatives in sedation protocols, highlighting the range of antihistamines employed in dental practice.

The primary reasons for antihistamine use in this study were pre-operative anxiety control (78.6%), salivation reduction (54.3%), and adjunct sedation (42.9%). These reasons are consistent with the literature, where antihistamines have been recommended for managing anxiety and reducing excessive salivation during dental procedures (11). The use of antihistamines for anxiety management could be particularly relevant, as dental anxiety is a common issue among patients and can significantly affect the treatment process (12). The sedative effects of antihistamines help ease patient discomfort and improve compliance during dental procedures, which could lead to more successful outcomes.

In terms of dosage adjustments, the findings indicate that 44.7% of dentists modified antihistamine doses based on patient factors, while 55.3% did not make such adjustments. This variation may be linked to differences in clinical experience, training, or the specific needs of patients. While some studies suggest that a standardized dosing approach is often used in dental practice (13), others emphasize the importance of personalized treatment protocols based on individual patient characteristics, such as age, weight, and medical history (14-16). The significant difference observed in dosage adjustments between private and hospital-based dentists ($p = 0.03$) suggests that the clinical setting may influence prescription practices. Private practice dentists may have more flexibility in adjusting treatments based on individual assessments, whereas hospital-based dentists might follow more rigid protocols (17).

A notable aspect of this study is the perception regarding antihistamines potentially replacing benzodiazepines. While 40% of dentists agreed with this notion, 33.3% disagreed, indicating a lack of consensus. Benzodiazepines, although effective, are associated with potential side effects, such as dependency, sedation, and cognitive impairment, which could make antihistamines an attractive alternative for sedation (18). However, the evidence supporting the complete replacement of benzodiazepines with antihistamines is limited (19). Antihistamines may not offer the same level of sedation, especially for highly anxious patients or those requiring deep sedation, which is why they are often considered adjuncts rather than replacements for benzodiazepines in clinical practice (20,21).

4.1 Limitations

While this study provides valuable insights, it has several limitations. First, the self-reported nature of the data may introduce response bias, as participants may underreport or overreport their practices. Second, the cross-sectional design limits the ability to draw causal relationships between variables, such as clinical setting and dosage adjustments. Additionally, the sample size, though representative of the population surveyed, may not capture the full range of practice behaviors across different regions or dental specialties. Future studies with a larger and more diverse sample could help enhance the generalizability of these findings.

4.2 Implications

The findings of this study have several clinical implications. The frequent use of antihistamines in dental sedation protocols highlights the need for updated training and guidelines for dentists to ensure safe and effective use of these medications. The consideration of antihistamines as potential alternatives to benzodiazepines could contribute to reducing the risks associated with long-term benzodiazepine use, particularly in patients with a history of substance abuse. However, further research is needed to determine the appropriate clinical indications, dosages, and efficacy of antihistamines in comparison to other sedatives.

5. Conclusions

In conclusion, this study reveals that antihistamines, particularly diphenhydramine, are commonly used by dentists for sedation, primarily for managing pre-operative anxiety and excessive salivation. While dosage adjustments based on patient factors are common, there is a variability in clinical practices, especially between private and hospital-based dentists. The possibility of using antihistamines as an alternative to benzodiazepines remains a topic of debate, with mixed opinions among practitioners. More extensive studies are required to further explore the safety, efficacy, and potential benefits of antihistamines in dental sedation, and to establish clearer guidelines for their use in clinical practice.

Conflict of Interests

The authors have no conflict of interests to declare.

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