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KNOWLEDGE OF ALLERGIC REACTIONS TO DENTAL PHAR MACEUTICALS AND MATERIALS AMONG PATIENTS, DENTIS TS, AND DENTAL PERSONNEL - A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: This study aims at examining the effects of the drugs and dental materials used in dental practices on patients and the dental personnel and the allergies manifested by them which may in some cases be adverse.

Materials And Methods: A self -administered questionnaire was distributed among 200 participants of whom 100 were dental patients and 100 were dentists and dental personnel for data acquisition. The chi-square test was applied for the statistical analysis.

Results: Awareness of allergic reactions due to dental products was low among the patients with only 19% of study population reporting awareness. The chi-square test for patients represented revealed significant association for variables such as observation of other people experiencing reaction ($p=0.011$) and patients association of adverse reactions with dental materials ($p=0.008$) to awareness of allergies due to dental drugs. 81% of the dentists and dental staff were shown to be aware of allergic reactions due to dental products but were found to have low awareness of the management of these reactions.

Conclusion: Majority of the patients have either not experienced or observed these reactions or have not associated these reactions with dental products leading to under-reporting of cases.

Keywords: Allergy, Awareness, Dental Practice, Dental materials, Drugs

Introduction

In recent years, concerns regarding the biocompatibility and hypersensitivity potential of dental materials have gained increasing attention. The dental operatory environment exposes both patients and dental personnel to a wide range of substances, including resins, latex, eugenol, formaldehyde,

impression materials, anesthetics, and various medicaments.[1] While these are considered safe under regulated usage, some individuals may develop adverse reactions, ranging from mild irritation to severe allergic responses, including anaphylaxis.[2]

The incidence of contact dermatitis, urticaria, respiratory symptoms, and localized mucosal reactions in dental settings is not uncommon, especially among professionals who face prolonged and repeated exposure to these agents.[3] Patients, on the other hand, may experience allergic responses post-procedure but often fail to recognize the origin of their symptoms, leading to under-reporting and misdiagnosis. One particularly challenging aspect is the lack of direct correlation between material use and symptom onset, which can delay diagnosis and intervention.[4]

Allergic reactions in dentistry can be broadly categorized as immediate (Type I) or delayed (Type IV) hypersensitivity reactions. Type I reactions are IgE-mediated and can result in systemic anaphylaxis.[5] Type IV reactions, more common in dentistry, are T-cell mediated and usually present as contact dermatitis. Materials commonly implicated include acrylic resins, methacrylates, nickel, latex, glutaraldehyde, and various antiseptics. Although regulatory bodies have improved safety standards, the diversity of products and lack of universal labeling continue to pose risks.[6]

Despite advancements in dental education, awareness levels especially among dental auxiliaries and newer practitioners can vary. Similarly, most patients are unaware of potential allergic components in dental products.[7] They often attribute symptoms such as swelling, itching, or burning sensations to procedural side effects rather than true allergic responses. This lack of awareness can compromise the quality of care, delay proper treatment, and put vulnerable patients at risk.[8]

Moreover, the management of allergic reactions in dental settings remains inconsistent. While dental practitioners may be familiar with common reactions, many do not routinely conduct allergy assessments or maintain comprehensive emergency protocols.[9] The presence of medical emergencies such as anaphylactic shock in a dental clinic demands not only awareness but also preparedness, including having epinephrine auto-injectors, oxygen, and trained staff capable of handling such incidents.

Given these concerns, the present study was designed to assess the awareness and understanding of allergic reactions caused by dental materials and drugs among both dental patients and professionals. It seeks to bridge the gap between exposure and knowledge, and further aims to highlight the importance of effective training and patient education to reduce clinical risks. By comparing awareness levels and analyzing patterns, this study contributes valuable insights to improving safety standards in dental practice.

METHODOLOGY

This was a descriptive, cross-sectional study conducted to assess the knowledge and awareness of allergic reactions related to dental pharmaceuticals and materials among dental patients and professionals. A total of 200 participants were included, comprising 100 dental patients and 100 dental professionals (including dentists, dental hygienists, and assistants). Ethical approval was obtained from the institutional review board vide number AIDC/39/24. All participants provided informed consent prior to participation. Confidentiality and anonymity of respondents were maintained throughout the study**.**

Participants were selected using a non-probability convenience sampling method from multiple dental care facilities, including outpatient departments and private dental clinics. Inclusion criteria were age ≥18 years, ability to comprehend the questionnaire, and informed consent. Those unwilling or unable to complete the questionnaire were excluded.

A self-administered structured questionnaire was developed in English and translated into Urdu for better comprehension among patients. The questionnaire included:

- Demographic data (age, gender, education, occupation)
- History of exposure to dental materials
- Awareness of allergic reactions
- Observation of allergic symptoms in self or others

• Knowledge of emergency protocols and management (for professionals)

The tool was reviewed by a panel of dental experts for content validity and pilot-tested on a small group (n=20) to ensure clarity and relevance. Revisions were made accordingly.
The questionnaire was distributed in person over a period of 2 months. Respondents completed the questionnaire anonymously and returned it immediately to the data collectors to reduce missing responses and ensure a high response rate.
Data were entered and analyzed using SPSS version 28. Descriptive statistics (frequencies, percentages) were used to summarize categorical variables. The Chi-square test was applied to assess associations between variables such as awareness levels and demographic or experiential factors. A p-value < 0.05 was considered statistically significant.

Results
Out of 100 patients, only 19% were aware of the possibility of allergic reactions caused by dental materials. 81% had never heard or been informed about such risks. A significant number ($p = 0.011$) who had witnessed others experience a reaction were more likely to be aware (Table 1).

Variable	Aware (n=19)	Not Aware (n=81)	p-value
Observed others with reactions	13 (68.4%)	24 (29.6%)	0.011
Associated symptoms with dental products	15 (78.9%)	17 (21.0%)	0.008
Reported allergic reaction themselves	5 (26.3%)	7 (8.6%)	0.045

Table 1: Patient Awareness

Among the 100 dental professionals surveyed, 81% reported being aware of allergic reactions related to dental drugs or materials. However, only 37% reported feeling confident about managing such reactions (Table 2).

Knowledge and Experience Metrics	Number (n=100)	Percentage (%)
Aware of allergic risks	81	81%
Experienced a patient with reaction	23	23%
Received formal training on management	32	32%
Confident in managing allergic reaction	37	37%

Table 2: Dental Personnel Awareness

DISCUSSION
The findings of this study reveal a concerning disparity between exposure to dental allergens and awareness and preparedness among both patients and dental professionals. Although a majority of dental professionals acknowledged the potential for allergic reactions in their practice, the results also highlight a critical knowledge gap in management protocols and emergency preparedness.
This study highlights a significant gap in awareness and preparedness regarding allergic reactions to dental materials and pharmaceuticals among both patients and dental professionals. Despite being commonly used in routine dental care, substances such as latex, eugenol, acrylics, and anaesthetics can trigger a range of hypersensitivity reactions, from mild dermatitis to life-threatening anaphylaxis. Among patients, only 19% were aware of the potential for allergic reactions. This finding is consistent with similar studies. Stielow et al (2023)[10] reported that only 22% of patients were informed or aware of possible allergic responses to dental materials. Chari et al. (2021)[11] similarly found that most patients were unable to link symptoms like itching, swelling, or burning to their dental treatments, leading to under-reporting and misdiagnosis. This indicates a persistent communication gap between

dental professionals and their patients, emphasizing the need for better patient education and informed consent practices. Furthermore, our study showed that patients who had observed allergic reactions in others were significantly more likely to be aware of the issue ($p = 0.011$). This is supported by findings from public health literature that suggest health-related awareness is often community-driven and improves through shared experiences (Lucas et al., 2025).[12]

Among dental professionals, 81% were aware of allergic risks, yet only 37% felt confident in managing allergic reactions. This disparity between knowledge and practical readiness was also reported by Cervantes-Arellano et al. (2024)[13], who found that while awareness of medical emergencies among dentists was high (80–85%), confidence in managing acute allergic reactions such as anaphylaxis was significantly lower (around 30–40%). This suggests a critical gap in emergency preparedness, likely resulting from limited training opportunities or outdated protocols. Only 32% of dental professionals in our study reported having received formal training in managing allergic reactions. This aligns with global findings by Scully and Barone et al, (2025)[14], who emphasized that the majority of dental professionals lack training in the use of emergency interventions such as intramuscular epinephrine and airway management. The absence of standard emergency drills or refresher training in many clinics further aggravates this issue.

These findings underscore the urgent need for targeted interventions, including regular continuing dental education (CDE) programs focused on allergy management, incorporation of emergency protocols into routine dental practice, and patient-cantered risk communication strategies. As emphasized by Federation et al. (2024)[15], the implementation of standardized screening and labelling for allergenic dental products should also be a regulatory priority to reduce the incidence of adverse reactions

CONCLUSION

This study reveals a substantial gap in awareness and preparedness regarding allergic reactions to dental materials and pharmaceuticals among both patients and dental professionals. While most dental personnel are aware of the potential for allergic reactions, a significant proportion lack the training and confidence to manage such incidents effectively. On the other hand, patient awareness remains notably low, with many unable to associate symptoms with dental products or procedures

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