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Prevalence and Distribution of Self-Reported Drug Allergies Among Patients Treated at a Brazilian Dental School

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Abstract:
Background: *Self-reported drug allergies are clinically relevant in dental practice because they may influence medication selection and patient safety. This study aimed to determine the prevalence and distribution of self-reported drug allergies among adult patients treated at a dental school and to investigate their association with demographic characteristics.* ***Materials and Methods:*** *This retrospective observational prevalence study reviewed 1,431 medical records of adult patients treated at a dental school in Teresina, Piaui, Brazil, between September 2020 and May 2022. Data on age, sex, skin color, self-reported drug allergies, and the drugs reported as causing allergic reactions were collected. Associations between self-reported drug allergy and demographic variables were assessed using the chi-square test, with statistical significance set at $p<0.05$.* ***Results:*** *Overall, 154 of 1,431 patients (10.8%) reported at least one drug allergy. Dipyrone was the most frequently reported drug (49.35%), followed by penicillins (18.2%) and other nonsteroidal anti-inflammatory drugs (16.88%). The prevalence of self-reported drug allergy was numerically higher among females than males (11.96% vs. 8.95%), although the association was not statistically significant ($p=0.072$). No significant associations were observed with age group ($p=0.402$) or skin color ($p=0.545$).* ***Conclusion:*** *Self-reported drug allergies affected approximately one in ten patients treated at the dental school, with dipyrone and penicillins being the most frequently reported drugs. No significant associations were found with sex, age group, or skin color. These findings reinforce the importance of careful medication and allergy history assessment during dental anamnesis.*

Keywords: *Drug Allergy; Drug Hypersensitivity; Dentistry; Prevalence; Patient Safety.*

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I. Introduction

Drug therapy is commonly employed in dental practice as an adjunct to treatment. Although medications are developed according to established safety standards and are essential for the management of many clinical conditions, their use is associated with inherent risks, including adverse drug reactions, drug interactions, contraindications, and other medication-related complications[1]. Among adverse drug reactions, drug hypersensitivity reactions comprise reactions that clinically resemble allergy and may involve either immunological or non-immunological mechanisms. When a specific immune mechanism is demonstrated or strongly suspected, the reaction is classified as drug allergy[2,3].

Allergic reactions may present with a wide range of clinical manifestations, from mild symptoms, such as skin rash and pruritus, to severe and potentially life-threatening reactions, including anaphylaxis [4,5,6]. Immediate drug hypersensitivity reactions can progress rapidly, emphasizing the importance of recognizing previous drug reactions during clinical assessment[5,6,7].

Therefore, careful assessment of patients' medical and medication histories is an essential component of dental care and may help identify potential risks before drugs are prescribed or administered[8]. This assessment is particularly important in dental school settings, where students are developing clinical decision-making and prescribing practices under faculty supervision, reinforcing safe prescribing practices from the early stages of professional training[9].

In this context, this study aimed to determine the prevalence and distribution of self-reported drug allergies among adult patients treated at a dental school and to investigate their association with demographic characteristics, including sex, age, and skin color.

II. Material and Methods

Study Design: Retrospective observational prevalence study based on the review of patients' medical records.

Study Location: The study was conducted at the Carolina Freitas Lira Dental School Clinic, Santo Agostinho University Center, Teresina, Piaui, Brazil.

Study Duration: Medical records of patients treated from September 2020 to May 2022 were reviewed.

Sample Size: A census approach was adopted, in which all 1,438 medical records of patients treated at the Carolina Freitas Lira Dental School Clinic, Santo Agostinho University Center, during the study period were screened for eligibility.

Subjects & Selection Method: A retrospective review was conducted of all eligible medical records of adult patients treated during supervised undergraduate Dentistry internships during the study period. Records included a direct question on drug allergy: "Do you have or have you ever had an allergy to any medication?". Affirmative responses were classified as self-reported drug allergy, and the implicated drug(s) were recorded. No confirmatory allergy testing was performed.

Inclusion Criteria: Medical records of patients aged 18 years or older who received dental care in the aforementioned supervised clinical internships during the study period were eligible for inclusion.

Exclusion Criteria: Medical records were excluded when they lacked patient identification or information required for the study, contained erased or illegible information, or represented duplicate records of the same patient treated in more than one supervised internship. Records of patients younger than 18 years were also excluded.

Data Collection: Data retrieved from each medical record included age, sex, skin color, history of self-reported drug allergy, and the specific drug or drugs reported by the patient as causing the allergic reaction. Data were entered into a spreadsheet specifically developed for the study using Microsoft Excel® 2020.

Ethical Considerations: The study was approved by the Research Ethics Committee of the Santo Agostinho University Center, Teresina, Piaui, Brazil (protocol no. 5,751,726), in accordance with Resolution 466/12 of the Brazilian National Health Council.

Statistical Analysis: Associations between self-reported drug allergy and categorical variables were assessed using the chi-square test (χ^2) or Fisher's exact test, when appropriate. Adjusted standardized residuals (ASRs) were evaluated for variables with multiple categories, with ASR>1.96 considered significant. Analyses were performed using SPSS version 20, with statistical significance set at $p<0.05$.

III. Results

A total of 1,438 medical records were identified and screened for eligibility. Seven records were excluded: one because the patient was younger than 18 years and six because of incomplete information, resulting in a final sample of 1,431 medical records. The most represented age group was 30-49 years, and the majority of patients were female.

Overall, 154 patients (10.8%) reported at least one drug allergy. Among the drugs reported as causing allergic reactions, dipyrone was the most frequently cited (49.35%), followed by penicillins (18.2%) (Figure 1). Because some patients reported allergy to more than one drug, percentages may exceed 100% when summed across categories.

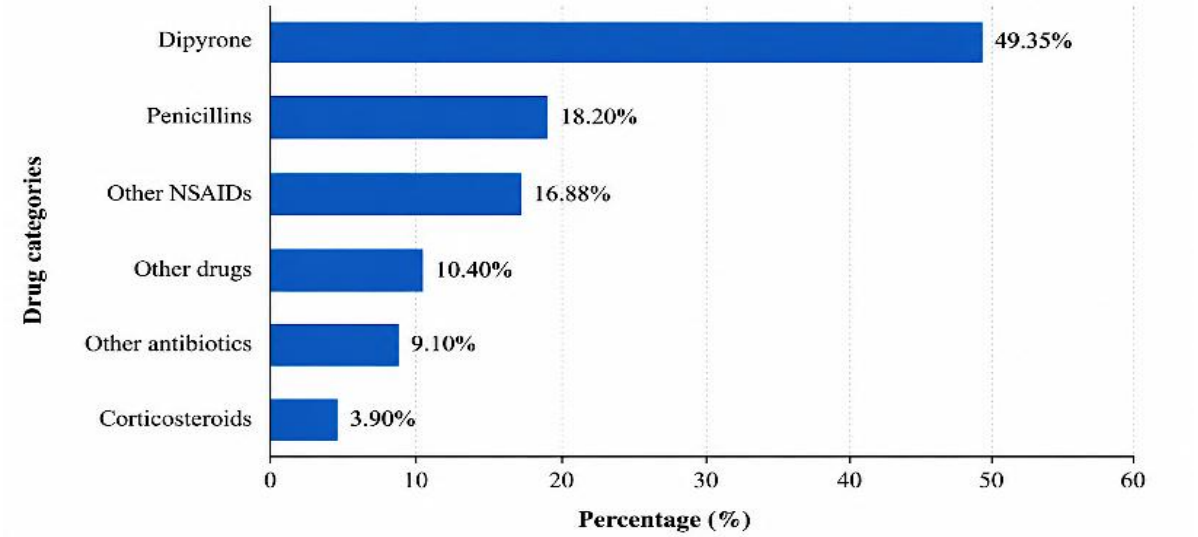

Figure 1. Distribution of drug categories associated with self-reported drug allergy among patients reporting at least one drug allergy.

Among NSAIDs other than dipyrone, paracetamol and nimesulide were the most frequently reported drugs, each accounting for 23.08% (n=6) of the reports (Figure 2A). Among antibiotics other than penicillins, sulfadiazine was the most frequently reported drug, accounting for 28.57% (n=4) of the reports, followed by sulfamethoxazole/trimethoprim with 21.43% (n=3) (Figure 2B).

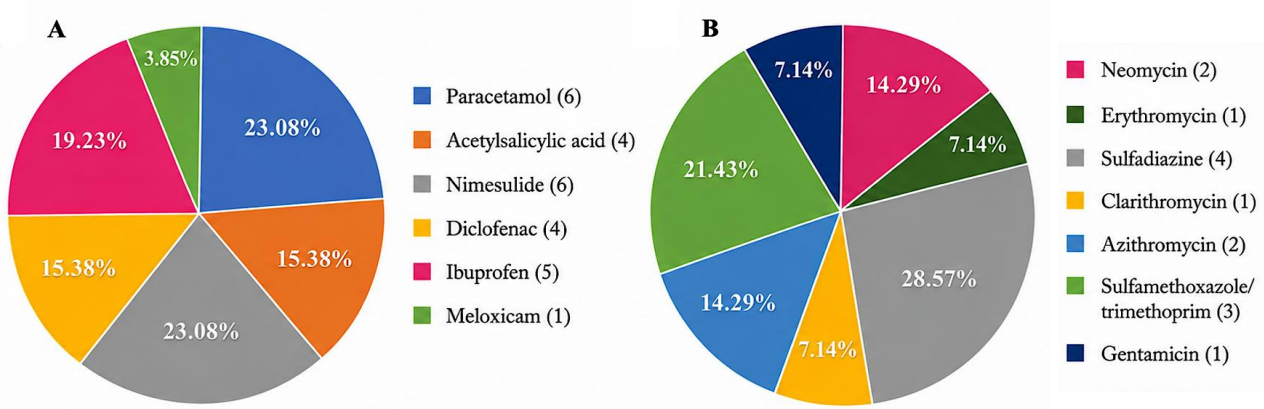

Figure 2. Distribution of drugs associated with self-reported drug allergy within specific drug categories. (A) Other nonsteroidal anti-inflammatory drugs (NSAIDs) and (B) other antibiotics.

Drugs that did not fall within the main pharmacological categories were grouped as "other drugs." Within this group, bromopride was the most frequently reported drug (31%), followed by metoclopramide (Plasil; 20%) and tramadol (Tramal; 12%). Promethazine (Phenergan) accounted for 7% of the reports, whereas salbutamol, omeprazole, histamine, nalbuphine, and captopril each accounted for 6%.

Associations between self-reported drug allergy and sex, age group, and skin color are presented in Table 1. The prevalence of self-reported drug allergy was numerically higher among females than males (11.96% vs. 8.95%); however, the association did not reach statistical significance ($\chi^2(1) = 3.247$, $p = 0.072$). Likewise, no significant associations were observed with age group ($\chi^2(3) = 2.935$, $p = 0.402$) or skin color ($\chi^2(3) = 2.136$, $p = 0.545$).

Table 1. Association of self-reported drug allergy with sex, age group, and skin color of the patients.

Variable	Category	Allergy Yes n	Allergy No n	Prevalence (%)	ASR	χ^2 (df)	p-value
Sex	Male	51	519	8.95	—	3.247 (1)	0.072
	Female	103	758	11.96	—		
Age group	18–29	48	457	9.50	-1.13	2.935 (3)	0.402
	30–49	58	499	10.41	-0.34		

	50–65	42	276	13.21	1.60		
	≥65	6	45	11.76	-0.24		
Skin color	White	30	280	9.68	-0.70	2.136 (3)	0.545
	Brown	82	637	11.40	0.79		
	Black	42	348	10.77	0.01		
	Other	0	12	0.00	-1.21		

Note: χ^2, Pearson chi-square test; ASR, adjusted standardized residual; df, degrees of freedom. Prevalence was calculated within each demographic category. Absolute ASR values >1.96 were considered indicative of a significant contribution to the association.

IV. Discussion

The prevalence of self-reported drug allergy in the present study was 10.8%, indicating that approximately one in ten patients reported a history of allergy to at least one medication. This finding closely agrees with recent epidemiological data indicating that approximately 10% of the general population engaged in health care report a drug allergy[3]. Careful assessment of patients′ medical history, including previous drug-related reactions, is important before prescribing or administering medications in dental practice and is particularly relevant in dental school settings, where appropriate assessment of drug allergies can contribute to the development of safe prescribing practices among future dental professionals[9,10].

Drug hypersensitivity and drug allergy are related but distinct concepts, hypersensitivity may involve immunological or non-immunological mechanisms, whereas drug allergy is specifically immune-mediated[6,7,11]. This distinction is relevant to self-reported data, as patients may describe drug-related reactions as ″allergies″ without diagnostic confirmation. Accordingly, the prevalence observed in this study represents self-reported rather than clinically confirmed drug allergy.

The prevalence observed in the present study was lower than the 26.42% frequency of self-reported drug hypersensitivity previously reported among 5,302 dental patients[9]. Although both studies relied on patient-reported drug reactions, differences in data collection methods, study populations, and terminology may have contributed to the contrasting frequencies. Nevertheless, both studies highlight the importance of documenting patient-reported drug reactions in dental settings.

Dipyrone (metamizole) was the most frequently reported drug associated with self-reported allergy (49.35%), possibly reflecting its widespread use in Brazil and consequent population exposure[12]. This finding is consistent with reports identifying dipyrone as a major cause of NSAID-related anaphylaxis in South America[10]. Hypersensitivity to dipyrone may involve IgE-mediated immediate reactions, T-cell-mediated delayed reactions, or non-immunological cross-reactive mechanisms related to COX-1 inhibition[13,1415].

Penicillins were the second most frequently reported category associated with self-reported drug allergy (18.2%), consistent with previous findings among dental patients[9]. Given the frequent use of beta-lactam antibiotics for odontogenic infections[16], a self-reported penicillin allergy may influence antibiotic selection. Immediate reactions are generally IgE-mediated and may include urticaria, angioedema, bronchospasm, or anaphylaxis, whereas non-immediate reactions are predominantly T-cell-mediated and commonly present as maculopapular eruptions[17,18].

No significant associations were observed between self-reported drug allergy and sex, age, or skin color. Although prevalence was numerically higher among women than men (11.96% vs. 8.95%) and was highest in the 50–65-year age group (13.21%), these differences were not statistically significant. Previous epidemiological data have shown that drug allergy and hypersensitivity may vary according to sex and age[3], and a recent study based on dental school patient records reported significantly higher frequencies of self-reported drug hypersensitivity among women, White individuals, and older adults[9]. Differences in study populations, medication exposure, and methods of assessing drug-related reactions may account for the different findings.

This study is limited by its retrospective design and reliance on self-reported information from medical records, without diagnostic confirmation or detailed characterization of the reported reactions. Nevertheless, the findings reinforce the importance of a comprehensive medical history, including reported drug allergies, current medications, and previous adverse reactions, to support safer therapeutic decisions. Future prospective studies incorporating detailed characterization and appropriate allergy assessment may help distinguish immune-mediated drug allergies from non-allergic hypersensitivity and other adverse drug reactions.

V. Conclusion

Self-reported drug allergies were relatively frequent among patients treated at the dental school, affecting approximately one in ten patients. Dipyrone was the most frequently reported drug, followed by penicillins. No significant associations were found between self-reported drug allergy and sex, age group, or skin color. These findings highlight the importance of carefully documenting patients' allergy histories during dental anamnesis to support safe prescribing practices.

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