Observance of the Adherence to Antibiotic Prescriptions by Iraqi Dental Patients: A Different Perspective on Antimicrobial Resistance

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Abstract

Background: The excessive use and abuse of antibiotics contribute to bacterial resistance, raising the risk of complications and treatment failures. This study investigates adherence to antibiotic prescriptions among Iraqi dental patients, highlighting implications for antimicrobial resistance.
Objective: To assess adherence levels and identify factors influencing antibiotic therapy compliance among dental patients.
Methods: A cross-sectional survey was conducted in which adult dental patients aged 18 and older, who had been prescribed antibiotics within the past year, participated. The modified Morisky Medication Adherence Scale-8 items was used to evaluate adherence, and data were analyzed with IBM SPSS Statistics software V26.
Results: Among 100 participants, 56% reported forgetting to take their antibiotics, 45% intentionally skipped doses, and 53% reduced or halted their doses. Adherence levels were categorized as medium in 45%, low in 28%, and complete in 27%. There were no significant differences by gender; however, adherence varied significantly across age groups, being higher in those aged 39-59.
Conclusion: The study underscores the need for targeted interventions to improve adherence to antibiotic therapy among dental patients, which is essential for mitigating antimicrobial resistance and enhancing treatment outcomes.
Keywords: Morisky scale, antibiotic stewardship, antibiotics, bacterial resistance, patient adherence

Abstrak

Latar belakang: *Penggunaan dan penyalahgunaan antibiotik yang berlebihan berkontribusi pada resistensi bakteri, meningkatkan risiko komplikasi dan kegagalan pengobatan. Penelitian ini menyelidiki kepatuhan terhadap resep antibiotik di antara pasien gigi Irak, dengan menyoroti implikasi terhadap resistensi antimikroba.*
Tujuan: *Menilai tingkat kepatuhan dan mengidentifikasi faktor-faktor yang mempengaruhi kepatuhan terapi antibiotik pada pasien gigi.*
Metode: *Survei potong lintang dilakukan terhadap pasien gigi dewasa berusia 18 tahun ke atas yang telah diresepkan antibiotik dalam tahun terakhir. Skala Kepatuhan Obat Morisky versi modifikasi-8 item digunakan untuk mengevaluasi kepatuhan, dan data dianalisis menggunakan perangkat lunak IBM SPSS Statistics V26.*
Hasil: *Dari 100 peserta, 56% melaporkan lupa untuk mengambil antibiotik mereka, 45% secara sengaja melewati dosis, dan 53% mengurangi atau menghentikan dosis mereka. Tingkat kepatuhan dikategorikan sebagai sedang pada 45%, rendah pada 28%, dan lengkap pada 27%. Tidak ada perbedaan signifikan berdasarkan jenis kelamin; namun, kepatuhan bervariasi secara signifikan antar kelompok usia, dengan yang tertinggi terdapat pada kelompok usia 39-59 tahun.*
Kesimpulan: *Penelitian ini menekankan perlunya intervensi terarah untuk meningkatkan kepatuhan terhadap terapi antibiotik di antara pasien gigi, yang penting untuk mengurangi resistensi antimikroba dan meningkatkan hasil pengobatan.*
Kata kunci: *skala Morisky, manajemen antibiotik, antibiotik, resistensi bakteri, kepatuhan pasien*

Introduction

The discovery and the use of antibiotics was one of the most important revolutions of the twentieth century to control and reduce infectious diseases. However, excessive use and misuse of antibiotics play an important role in increasing bacterial resistance, leading, in turn, to an increased risk of complications and mortality and, consequently, to a more complex resolution of infectious diseases and potential treatment failure. Moreover, the overuse of antimicrobials increases healthcare costs , thereby causing a global public health problem that crosses all borders and is present worldwide.[12] Antimicrobial resistance (AMR) is caused by several factors, including inappropriate antibiotic prescription with overuse or misuse, and poor patient adherence to antimicrobial therapy, non-compliant with treatment recommendations, registering an increase in the improper use of antibiotics across Europe in recent years. Out of all antibiotics administrations, 7–10% were in an outpatient environment, with dentistry accounting for a comparatively higher amount of these prescriptions, as confirmed by numerous findings highlighting that dentists often do not observe antibiotics prescription guidelines, especially for prophylactic purposes in dentoalveolar surgery.[3] In addition, according to a recent global survey, non- adherence to antibiotic therapy, which determines an inappropriate use and may increase the risk of therapeutic failure, reinfection, and AMR, was estimated at around 22.3%, with a variation between 9% and 44% among countries.[4] Consequently, several measures were undertaken to improve patients' adherence to short-term antimicrobial treatments, comprising accurate antibiotic prescriptions and written information on the importance of taking all medications. Considering the contributing role of patients' adherence to antibiotic treatments in AMR and the insufficient evidence concerning dental prescription, the study primarily aimed to assess the adherence to oral antibiotic therapy through a modified Italian version of the Morisky Medical Adherence Scale-8 items, also in relation to participants' characteristics, and secondarily to evaluate the awareness of antimicrobial resistance among dental patients

Methods

The study was conducted at the College of Dentistry, Baghdad University, aimed at understanding the adherence to antibiotic prescriptions among Iraqi dental patients. It followed strict ethical guidelines established by the university, ensuring that all respondents participated voluntarily and that their rights and welfare were protected in alignment with the principles of the Helsinki Declaration.[7]

A cross-sectional survey design was chosen for this study to collect quantitative data regarding antibiotic adherence among dental patients. The participants were adult dental patients aged 18 and older who had been prescribed antibiotics within the past year. Individuals were included in the study if they provided informed consent. Conversely, patients with cognitive impairments that hindered their understanding of the survey and those currently enrolled in clinical trials involving antibiotics were excluded to avoid confounding factors.

The questionnaire depended on the modified version of the Morisky Medical Adherence Scale-8 items (MMAS-8). This scale was initially developed to evaluate medication adherence in patients with hypertension, but it is now widely used in various other patient populations. With a sum of scores equalling 8, 6 to <8, or <6, patients can be categorized as having high, medium or low adherence to therapy. The questionnaire is formed of eight questions, evaluating for Adherence to Antibiotic Prescription of Dental Patients. the questionnaire score was computed as follows: one point was assigned to no answers, and no points were assigned to yes answers, except for item 5, where the scores were inverted (no points were assigned to no answers, one point was assigned to yes answers). For item 8, the answers never and rarely were assigned a value of 1, while the answers sometimes, often, and always were assigned a value of 0. The total questionnaire score ranged from 0 to 8, where a score of 8 indicated complete adherence, scores of 6-7 showed medium adherence, and scores < 6 indicated a low adherence to antibiotic therapy.

For data analysis, IBM SPSS Statistics software V26 was used. Descriptive statistics (graphical analysis) were conducted to calculate the mean, and standard deviation. Cronbach's alpha is used to assess the reliability, or internal consistency, of a set of scales or test items. To find the correlation, The independence test and Chi-square test, was used, and to explain the relation, linear regression was applied. Statistical significance (two-tailed) was defined as p 0.05.

Results

Patients attending dental clinics participated in the survey study. The ratio between the male and female 50/50. The age groups were as follow; 48 % (39-59), 44 % (18-38) and 8 % (60-80). Descriptive statistic as follow;

Forgetting Medications: more than half of participants (56%, n = 56) reported forgetting to take their antibiotics at least sometimes. There were no statistically significant differences in forgetting by gender or age group (p > 0.05).

Intentional Non-Adherence: When asked about intentionally skipping medications other than due to forgetting (45 yes, 55 no), the results indicated that almost half (45%) admitted to skipping doses occasionally.

Reducing or Stopping Doses: Over half (53%, n = 53) of participants acknowledged decreasing their antibiotic doses or stopping them entirely at some point during treatment.

Traveling and Medication: Over half (55%, n = 55) reported forgetting to take their antibiotics when traveling or leaving home.

Completing Full Course: Despite forgetting or skipping doses, a majority (58%, n= 58) claimed to take their antibiotics on the last day of treatment.

Early Cessation: A significant portion (66%, n = 66) admitted to stopping their antibiotics early due to feeling better.

Perceived Hassle: While a substantial number (39%, n = 39) found taking antibiotics at specific times to be a hassle, the majority (61%, n = 61) did not report this as a problem.

Frequency of Forgetting: Difficulty remembering to take antibiotics was most commonly reported as "sometimes" (45%), followed by "rarely" (43%), "often" (1%), and "always" (9%). Only 2% reported never forgetting their antibiotics.

This data suggests that a significant proportion of patients in this study struggle with medication adherence for antibiotics. Forgetting, intentional skipping, early cessation, and forgetting while travelling were all documented with some frequency. Table 1 summarized the patients response.

Based on the Morisky Medical Adherence Scale-8 items questionnaire, the score distribution based on the reported answers is shown in Figure1. The overall level of adherence resulted as medium in 270 (45 %) subjects, low in (28 %), and complete in (27 %), respectively (Figure 1)

Discussion

In dentistry and throughout medicine, the problem of antibiotic resistance is becoming more and more of a worry. When antibiotics are overused or misused, resistant bacteria can grow, making illnesses more difficult to cure and perhaps leading to major health issues.

One of the key factors contributing to antimicrobial resistance is the lack of adherence to prescribed antibiotic therapy. In our study, we found that only 27% of dental patients adhere to their prescribed oral antibiotic therapy, with the majority falling into the medium or low adherence categories. The finding of this study agree with the study of Llor et al, as they found that a non-adherence of 25.2% in a Spanish sample.[8]

Table 1. Adherence to antibiotic prescription of dental patients questionnaire and responses

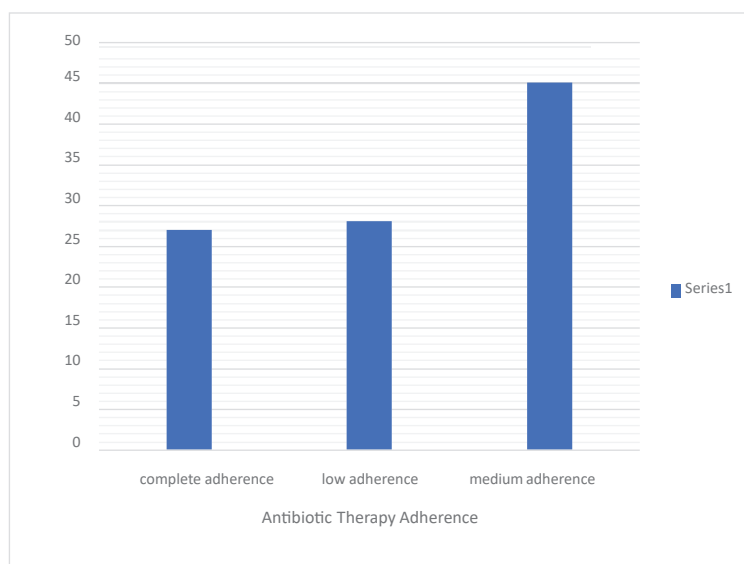| No	Questionnaire Item	Yes (%)	No (%)
1	Have you sometimes forgotten to take antibiotics?	56	44
2	Some people sometimes skip taking their medications, but not because they forget. Were there days when you didn't take your antibiotics?	45	55
3	Have you ever decreased your doses or stopped taking your antibiotics?	53	47
4	When you travel or leave home, have you sometimes forgotten to take antibiotics with you?	55	45
5	Did you take antibiotics on the last day of treatment?	58	42
6	When you felt better, did you sometimes stop taking the antibiotics?	66	34
7	Has having to take antibiotics in fixed doses and at the right time ever bothered you?	39	61
8	How often did you have difficulty remembering to take antibiotics?	-	-
	(Always: 9%, Often: 1%, Sometimes: 45%, Rarely: 43%, Never: 2%)	-	-

Table 2. Chi-square test results for adherence differences among age groups

Category	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-square	19.906*	4	0.001
Likelihood ratio	20.196	4	0.000
N of Valid Cases	100		

Note: *3 cells (33.3%) have expected count less than 5. The minimum expected count is 2.16..

Moreover, a study by Tong et al. in a Chinese study, adherence to antibiotic therapy was observed in only 13% of patient.[9]

Such low adherence rates are alarming because antibiotics must be used appropriately to treat bacterial infections and stop resistance from growing. Patients may stop taking antibiotics once they feel better, skip doses, or not finish the entire course of treatment, all of which can lead to the development of resistance.

On the other hand, no relation has been presently found between the level of adherence to antibiotic therapy and gender, compliant with the results of a recent meta-analysis.[10] However, conflicting results have been obtained by 11 reporting lower adherence in the female gender.

Furthermore, this study also showed significant differences in adherence to antibiotic treatment among different age groups. It was surprising to see that the age group 39-59 had the highest adherence rate, while the younger age group of 18-38 had the lowest adherence rate. In agreement with the results of Fernandes et al,

identified increasing age as a factor associated with non-adherence[12] Additionally, Rolnick et al., found a greater non-adherence in younger patients. This may indicate a need for targeted interventions to improve adherence among younger patients, who may be less likely to prioritize their oral health or adhere to medication regimens.[13]

To address this issue, dental professionals need to educate their patients on the proper use of antibiotics and the consequences of non-adherence. This may involve providing clear instructions on when and how to take the medication, as well as explaining the importance of completing the full course of treatment.[14]

Additionally, dentists should be cautious in prescribing antibiotics, reserving them for serious bacterial infections and avoiding their routine use for conditions that do not require them. This can help reduce the overall burden of antibiotics in the community and minimize the risk of resistance.[15]

Overall, improving adherence to antibiotic therapy among dental patients is crucial in the fight against

antimicrobial resistance. By working together to educate patients and promote responsible prescribing practices, we can help preserve the effectiveness of these life-saving medications for future generations.

Conclusion

This study highlights significant challenges in antibiotic adherence among dental patients in Iraq, revealing that a considerable portion of patients forget or intentionally skip doses. The findings emphasize the need for targeted interventions tailored to address the identified barriers, particularly among younger age groups. By improving adherence to antibiotic regimens, healthcare professionals can play a pivotal role in mitigating the risk of antimicrobial resistance, ultimately enhancing treatment outcomes in the dental community.

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Author Contribution

All authors made essential contributions to the study's design, data collecting, analysis, and interpretation of results. All authors wrote and updated the article, accepted the final version, and agreed to be held liable for all elements of the work.

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Declaration of Competing Interest

The authors declare no conflicts of interest.

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