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Knowledge and Behavior of a Group of Dentists towards Antibiotic Prescription to Pediatric Patients in Baghdad

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Abstract

Aim of the study: To evaluate the knowledge and behavior of a group of dentists in Baghdad towards prescribing antibiotics to pediatric patients.

Material and method: A Cross sectional study was conducted by an electronic self- administered questionnaire to dentists specialized in Preventive or Pediatric Dentistry, general dentists with certificate in Preventive and Pediatric and Preventive Dentistry and to general dentists working in health centers of Al-Resafa in Baghdad. Open-ended and closed-ended questions were directed to the dentists regarding the knowledge and behavior towards prescribing antibiotics to children.

Results: (116) dentists responded to the questionnaire consisted of (36) specialized dentists in Pediatric or Preventive dentistry, (8) general dentists (certificate in Preventive and pediatric Dentistry) and to (72) general dentist. Most of the dentists with an age range from 21 to 30. Females constituted most of the sample (74.1%). General dentists represented the higher proportion (62.1%). Only (38.8%) of the dentists were self-educated whereas the medical websites seemed to be the main source (80.0%). Besides, only (13.8%) of total dentists have attended scientific medical course on antibiotics indications and/or resistance for the last two years. Amoxicillin was the main antibiotic prescribed for non-allergic children (75.9%), whereas Erythromycin and Azithromycin were prescribed for allergic children (73.3%). (42.2 %) of the sample prescribed antibiotics once per-week, while (13.8%) prescribed on need. Cellulitis contributed (60.3%) among conditions need prescription of antibiotics before and/or after the treatment. Regarding the prophylactic antibiotics, high risk cardiac conditions represented (93.1%).

Conclusion: Most of the general and specialist dentists were aware towards antibiotics prescription for children but lacked in updating their information which based primarily on their previous dental education.

Keywords: Surface treatments, Shear bond strength, Biodentine, composite resin.

Introduction:

In dental clinic, dentists need to prescribe many types of medications to treat oral and dental diseases as well as conditions, such as viral diseases, bacterial infection, fungal, as well as swelling and pain. Among children and adults, it was found that antibiotics remain to be the most prescribed medications [1,2].

In recent years there has been an increasing tendency to reduce the widespread use of antibiotics for prophylactic and therapeutic purposes. Today there is no clear consensus among experts on the use of antibiotics in Dentistry [3]. It was reported that many dentists trend to abuse antibiotics to manage nonindicated cases, such as irrevocable pulpitis, swelling, pain, and

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dento-alveolar abscess [4]. The overuse and abuse of antibiotics [5] and promotes to the emergence of antibiotic resistance in children [6] may be attributed to the inadequate understanding of the suitable clinical suggestions for antibiotic recommendations and uses.

The administration of medications to pediatric patients is further problematic by the need to adjust the dosages of drugs to accommodate their lower body weight [7]. Some studies revealed that the decision of treatment done by the health care professionals focus only on the current symptoms without worry about outlook antibiotics resistance that may aggravate the case [8,9].

Among healthcare workers, especially dentists, the knowledge about the danger of antibiotic resistance during prescription to manage various dental infections is not uniform. And because of high expectation of contamination during dental procedures, the antibiotics are usually used in dental procedure [10]. The dentists who have insufficient dental practices which manifested by over-prescribing and abuse of antibiotics are due to inadequate knowledge or social reasons [11].

Improper prescription of anti-biotics among pediatric patients, like improper dosage and/or more than required periods of management might be responsible for antibiotic tolerance. As a sequence, it was found that the oral cavities of a small children have many drugs tolerant micro-organisms [12,13]. The pediatric dentists have also been mentioned as an unnecessary use of antibiotics which was noted in orofacial infections among children [14,15]. Another study indicated that the effect of antibiotic recommending by dentists and the awareness of antibiotic tolerance are low down [16]. The aim of this study was to assess the knowledge and behavior of a group of dentists in Baghdad towards prescribing antibiotics to pediatric patients.

Materials and methods:

A cross-sectional study was done by distributing an electronic self-administered questionnaire generated by Google Forms web application to (116) respondent dentists working in different specialized and primary health centers in Al-Resfa area in Baghdad (Study No. 147657) . The responses consisted of (36) specialized dentists in Pediatric or Preventive Dentistry (Master of Sciences M.Sc. and Higher Dental Diploma H.D.D.) and (8) general dentists (certificate in Preventive and Pediatric Dentistry) and (72) general dentists (Bachelor of Dental

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Surgery B.D.S.). All dentists were asked whether they practiced private work or not. The questionnaire consisted of two sections: the first section provided personal demographic and work-related information including: age, gender, degree of dentistry educational achievement of the participants and the second section provided closed-ended and open-ended questions regarding the awareness and behavior of dentists towards prescribing antibiotics to pediatric patients.

An approval was taken from Iraqi Ministry of Health / Al-Resafa Health Office to involve the dentists working in the specialized centers and primary centers of Al-Resafa. A consent was taken from the participating dentists to be involved in the study and a briefing to the study was presented in the form as an introduction. The data analyzed by descriptive statistics using SPSS program version 26. The questionnaire link was distributed to the targeted sample by WhatsApp application and electronic mails. Mails and data were collected in the period of two months November and December 2022.

Excluded criteria: Dentists specialized in other than Pediatric or Preventive Dentistry and dentists working in centers not related to Al-Resafa Health Office Centers in Baghdad.

Results:

Table 1 reveals the distribution of the sample by age and gender. It was found that most of the dentists with an age range 21 to 30 years (37.9%), followed by the second age range which was leveled to 40 years (36.2%). For the total sample, it was found that females constituted most of the sample (74.1).

Table 1: Distribution of the sample by age and gender.

Age groups (Year)	No.	%
21 – 30	44	37.9
31 – 40	42	36.2
41 – 50	23	19.8
51 – 60	07	06.1
Total	116	100
Total Males	30	25.9

DOI: 10.32828/mdj.v19i1.988

Total Females	86	74.1

According to the scientific degree and working sector, table 2 illustrates that the general dentists who gained Bachelor of Dental Surgery were formed the higher proportion of the sample (62.1%), followed by the specialist dentists in preventive or pediatric dentistry (31%). Besides, 66.4% out of the total dentists were working at governmental dental institutes.

Table 2: Scientific degree and working sector of the dentists.

Dentist		No.	%
Scientific degree	Specialist in preventive or pediatric dentistry	**36**	**31.0**
	Certificate in preventive and pediatric dentistry	**08**	**06.9**
	Bachelor of Dental Surgery	**72**	**62.1**
Working sector	Government	**77**	**66.4**
	Private and government	**39**	**33.6**

Table 3 shows the self-education of the dentists on updated protocols regarding the antibiotics in Pediatric Dentistry for the last two years. It was found that only 38.8% of dentists were self-educated whereas the medical websites seemed to be the main source (80.0%). Also, the table reveals that only 13. 8% of total sample of dentists have attended scientific medical courses on antibiotics indications and/or resistance for the last two years.

Table 3: Self-education of the dentist and attending scientific course on the antibiotics in Pediatric Dentistry for the last two years.

DOI: 10.32828/mdj.v19i1.988

Self-education on antibiotics					
No		Yes		The source	No. %
No.	%	No.	%		
71	61.2	45	38.8	Medical books	09 20.0
				Medical websites	36 80.0
				Medical colleagues	13 29.0
Attending scientific course on antibiotics					
		No		Yes	
		No.	%	No. %	
		100	86.2	16 13.8	

Figures (1) A and (1) B demonstrate the most prescribed antibiotics for pediatric patients in dentistry. It was found that Amoxicillin was the main antibiotic prescribed by the dentists for patients who were non-allergic to penicillin (75.9%) followed by Amoxicillin-Clavulanic acid (20.7%). Whereas Erythromycin and Azithromycin contributed the chief antibiotics were prescribed by the dentists for patients who were allergic to penicillin (73.3%), followed by Cephalexin (37.9%).

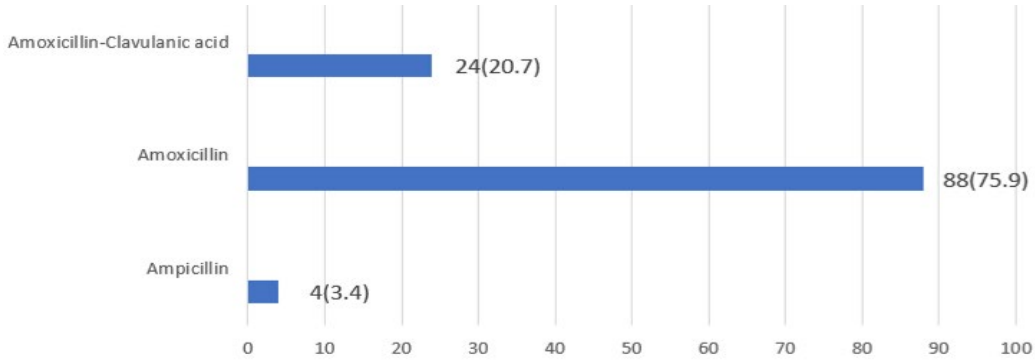

Figure 1(A): Prescribed antibiotics for non-allergic pediatric patients.

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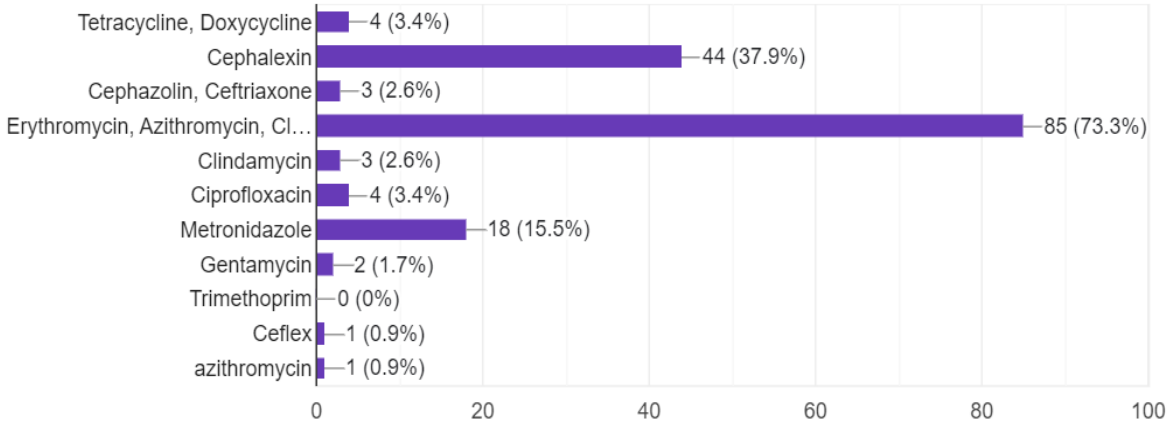

Figure 1(B): Prescribed antibiotics for allergic pediatric patients.

Table 4: Time and duration of antibiotics prescription to children.

Antibiotics prescription		**No.**	**%**
Time per-week	*No prescription*	01	00.9
	Once	49	42.2
	Twice	33	28.4
	Three times	16	13.8
	Five times	01	00.9
	On need	16	13.8
Duration per-day	*No prescription*	01	00.9
	1 – 3 days	40	34.4
	3 – 5 days	61	52.6
	6 days	14	12.1

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Table 4 reveals time per-week and duration of antibiotics prescription to children. 42.2 % of the sample prescribed antibiotics once per-week, while 13.8% of the dentists prescribed antibiotics three- times a week and the same percent prescribed on need.

Figures 2 (A) and 2 (B) explain the conditions in pediatric dentistry require the antibiotics prescription before and/or after the treatment and the prophylactic antibiotics prescription before the treatment. It was found that cellulitis contributed the high percent (60.3%) among conditions need prescription of antibiotics before and/or after the treatment, then the chronic dental abscess (47.4%). Whereas mild dental traumas were situated in the last position (3.4%). Regarding the prophylactic antibiotics, high risk cardiac conditions positioned the first one (93.1%) then the immune-compromised patients (61.2%).

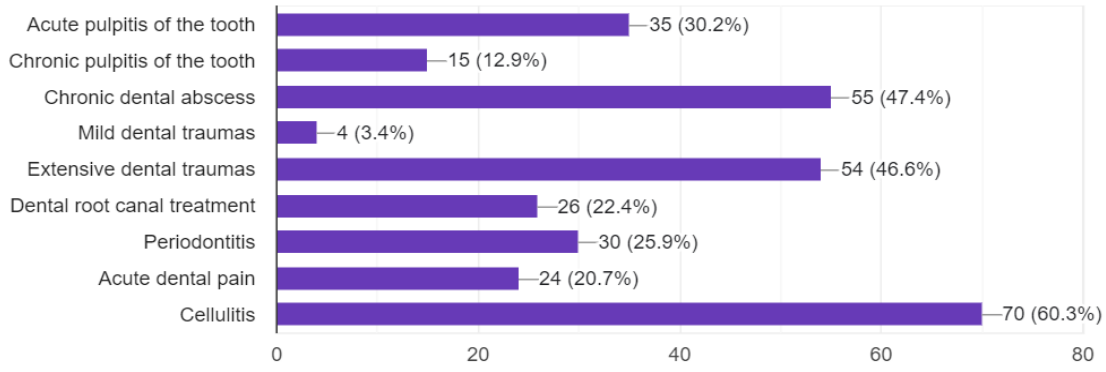

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Figure 2 (A): Conditions in Pediatric Dentistry require the antibiotics prescription before and/or after the treatment.

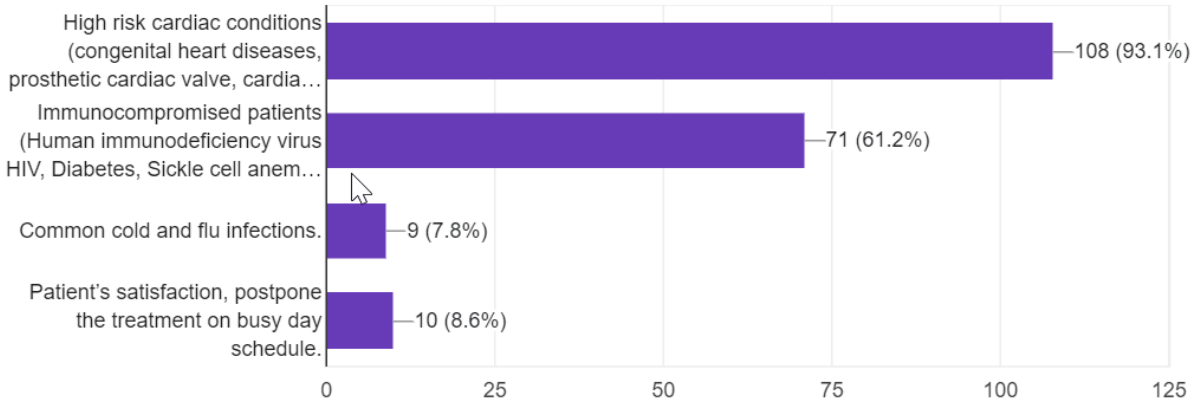

Figure 2 (B): Conditions in Pediatric Dentistry require the prophylactic antibiotics prescription before the treatment.

Discussion

The antibiotics in Dentistry are becoming more common and are primarily indicated for infection control [17]. With this rising prescription trend, the global problem of antibiotic resistance is a reason for concern [18]. Among children with orofacial infections, also inappropriate use of antibiotics has been noted. For pediatric dentist, awareness of the perfect indications of antibiotics is essential. When prescribed anti-biotics systemically, those medications should be utilized as an adjunct to the treatment of particular oral infections or as prophylaxis to avoid severe bacteremia [19]. Most of the respondents in this study were within the age group of 21 to 40 years and females represented the higher percent compared to males. It showed that about two thirds of respondents in the conducted survey were general dentists working in governmental sectors compared to other categories which came after.

The study showed that most dentists lacked in updating their information on antibiotics use and resistance and prescribing protocols in Pediatric Dentistry, and only about a third of them relied on self-education to update information, primarily using medical websites, compared to a smaller proportion of those who sought advice from medical colleagues or researching medical book references. In addition, more than two thirds of dentists have not attended scientific events, conferences or courses in the last two years of their practice in this regard. Aly et al.

DOI: 10.32828/mdj.v19i1.988

found that the many dentists, markedly general dentists, did not follow professional strategies for prescribing antibiotics among children, in spite of being aware of antibiotic resistance and prescribing strategies [20]. Knode et al. confirmed that awareness of antibiotic prophylaxis and antibiotic resistance was sufficient among general and pediatric dentists. However, there was a general lack of awareness of antibiotic prescribing guidelines in both groups [21]. Rubanenko et al. revealed that the high percentage of dentists among both groups did not know if the antibiotics are needed in a given dental situation or not. He concluded that the awareness level of both pediatric and general dentists is low, [22].

Most dentists in the study prescribed majorly Amoxicillin followed by Amoxicillin-Clavulanic acid antibiotics for non-allergic to penicillin patients. This is agreed by Paude et al. [23]. Which may be attributed to that Amoxicillin, together alone and in grouping with clavulanic acid, is considered the drug of first choice for the treatment of dental infections in pediatric patients and adolescents. Amoxicillin is a common cause of allergic reactions, so good history-taking is needed. It is active against a broad range of gram-positive bacteria and against some gram-negative bacteria (in such situation, Amoxicillin works better than Penicillin). The little amount of side effects is positive, yet, the addition of clavulanic acid can be associated with more side effects, such as diarrhea [24]. Al-Johani et al. found that Amoxicillin was the most usually preferred antibiotic for the majority of the orofacial infections among the dentists [25]. On the other hand, Aly et al. concluded that clavulanic acid together with Amoxicillin was usually prescribed antibiotic then Amoxicillin [20]. For patients allergic to penicillin the study showed that Erythromycin and Azithromycin antibiotics contributed the chief antibiotics that were prescribed by more than two thirds of the dentists in the survey and is followed by Cephalexin. D'Ambrosio et al. suggested that the majority of dentists prescribed macrolides in the case of an allergy to penicillin [26]. Generally, this study indicated that the prescription of antibiotics by the dentists was mostly once a week with duration for 3-5 days. This suggested prescribing antibiotics for the correct duration and frequency tends to reduce adverse outcomes and relieves the problem of antibiotic tolerance. Whereas other investigation found that most dentists for both groups (the general and specialists) given antibiotics for 5–7 days [20].

DOI: 10.32828/mdj.v19i1.988

The study revealed that the dentists used to prescribed antibiotics in case of both prophylactic conditions and dental conditions treatment purposes. The presumed dental conditions that mandate the prescription of antibiotics to children by general and specialist dentists according to their practice before and after the treatment in this survey were referred mainly to cellulitis, chronic dental abscesses, and extensive dental traumas respectively. Moreover, less than one third of the respondents indicated the use of antibiotics in acute pulpitis cases and periodontitis. Some studies suggested that scientific evidence is considered insufficient to confirm the use of antibiotics to treat irreversible pulpitis and periapical abscesses [27,28]. D'Ambrosio et al. found that abscesses, extractions, and pulpitis were the top reasons for prescribing antibiotics by dentists [26].

Among the prophylactic conditions which need antibiotics prescription to children: patients within the high-risk cardiac and immunocompromised conditions were confirmed to prescribe the antibiotics for them by most of the dentists in the present study respectively. This came in accordance with Ramadan et al. [29]. Antibiotic prophylaxis is suggested by American Heart Association for patients suffering from heart disease as they are at highest risk of an adverse consequence [30]. On the other hand, the prophylactic use of antibiotics has been considered for many diseases, with infective endocarditis being the sign with the best-established guidelines [31]. Although fewer dentists in the study indicated that common cold or delay the treatment due to busy schedule working day or according to patient's parents' satisfaction required prophylactic antibiotics prescription according to their practice. The non-clinical circumstances acting as factors for antibiotic usage involve uncertain analysis of the situation, necessity to delay of treatment owing to inaccessible appointments, challenges such as unsuccessful sterilization, and social dealings. Other observed prescribing performance in regarding to pediatric dentistry may be due to the stress of the parent where this parental stress has been noted as one of the fundamental reasons of unnecessary prescriptions. Besides, it was recommended that practitioners suppose that applying antibiotics is the fastest way to solve any type of consultation [15].

A previous study suggested that most dentists recommend antibiotics in cardiovascular diseases, while for blood dyscrasias, viral contaminations, juvenile diabetes and respiratory diseases, most of the

DOI: 10.32828/mdj.v19i1.988

dentists stated that they would not prescribe antibiotics [20]. The Antibiotics for Dental Pain and Swelling Guideline (2019) which was advocated by the American College of Emergency Physicians discouraging the usage of antibiotics for most pulp and periapical infections, and instead only using dental treatment and when wanted and, if needed, over-the-counter pain reliefs for instance, ibuprofen and acetaminophen. Dentists should prioritize dental treatments for example: non-surgical radicular pulp treatment, incision and drainage for symptomatic permanent pulpitis, symptomatic apical periodontitis, as well as localized acute apical pus among peoples who are not cruelly immunocompromised. If a patient's situation advances to systemic involvement, displaying signs of illness, fever or malaise, then dentists would advise antibiotics [32].

The study had a limitation that it was completely dependent on self-administered information from the participating dentist and not according to the documented records of antibiotics prescription in the selected centers in the study.

Conclusions

1. Most of the general and specialist dentists were generally aware towards antibiotics prescription for children in certain dental and prophylactic conditions according to their practice mainly in the governmental centers and based primarily on their previous dental education, knowledge and occasionally relied on medical websites to update their related information.
2. There is a prime need for updated regular scientific courses for dentists for adhering to the antibiotics uses protocols and guidelines in Pediatric Dentistry to overcome the misuses and/or overuses of these drugs and to raise the awareness of the dilemma of antibiotics resistance and the negative impact and consequences that may cause.

Suggestions:

1. Other studies can be done to involve other regions and all the Preventive and Pediatric dentists in all the specialized centers in Iraq.
2. Other studies can be done using patients' records about antibiotics prescription for children in Dentistry.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Conflict of interest: None.

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Data Availability Statement

Data are available from the authors upon reasonable request.

Conflict of interest

The authors reported that they have no conflicts of interest.

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