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Research Article

Assessing The Knowledge and Attitudes of Group of Practicing Dentists in Saudi Arabia with Regards to Antifungal Prescriptions for The Treatment of Oral Candidiasis: A Cross-Sectional Study.

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Abstract:

Introduction: Candida albicans is the most prevalent causative species of oral fungal infections. This study was designed to assess the knowledge of dentists who are practicing in a dental university hospital regarding antifungal prescriptions for the treatment of oral candidiasis in a Riyadh city, SA.

Material and Methods: A self-administered questionnaire were distributed among dentists of different specialties to assess their knowledge and attitudes toward antifungal prescription for the treatment of oral candidiasis. Statistical analysis was carried out to describe the properties of the sample in terms of frequencies and distribution while chi square test was used to compare the results between groups at level of significant P value ≤0.05 using the Statistical Packages for the Social Science (SPSS) Program.

Results: A total of 130 completed questionnaires were received. Males contributed 55.4% compared to 44.6% female counterparts. Topical antifungals were preferred by 85.4% of the participants. Topical Nystatin and oral fluconazole were the chosen antifungal agents by the dentists for the treatment of local (55.4%) and systemic (58.4%) fungal infections respectively. The challenge that was faced by most respondents (46%) is the lack of knowledge about the recommended dosage to be prescribed. Also, a significant difference in the knowledge was detected between dentists of different specialties.

Conclusion: Most dentists will start with topical antifungal agents, nystatin suspension is the first medication of choice follow by miconazole and for the systemic antifungal agents oral fluconazole is first medication of choice. As for the adjunctive therapy most participants prescribed 0.2% chlorhexidine gluconate mouthwash.

Keywords: Antifungal Prescriptions, Dentist, Knowledge Assessment. Oral Candidiasis..

Introduction

There is evidence increasing of Candida species becoming more resistant to some antifungal agents, particularly the azole group.(1) C. albicans is the most common species among oral fungal infections. About 93% of denture stomatitis patients are linked to C. albicans fungal infections. Moreover, other fungal species such as; Candida glabrata and Candida tropicalis are often associated with the denture place and the palatal surface of healthy denture wearers . C. albicans is an oral commensal found in 40% of human beings and has a role in the formation of denture plaque.(2)

Topical anti-fungal is selected as the treatment of choice for the healthy individuals infected with candidiasis, while systemic administration is indicated in recurrent or disseminated infection especially present in low immunity patients.(3) Oral candidiasis is managed by correct investigation of the predisposing factors and use a proper antifungal medication which eventually mandates sufficient knowledge of the clinicians on the diagnosis and antifungal treatment of the infections.(3)

Health care providers became more conscious and mindful of oral fungal infection particularly following the emergence of human immunodeficiency virus (HIV) infection and the widespread use of broad spectrum antibiotics and immuno-suppressant therapy.(4) It is common to encounter a recurrence of the oral candida infection, sometime of institution of antifungal therapy, which constitutes a frustration and disappointment for both the clinician and the patient.(5) Other factors were also implicated fungal infections such as old age, certain medications, Cushing's syndrome, malignancies, and the use of dentures.(6)

As a part of a comprehensive management of such infections, the healthcare practitioner's knowledge of available and suitable prescriptions for the treatment is mandatory. Hence, this study was developed to measure the knowledge and attitudes of dentists regarding antifungal prescriptions.

Material and Methods

A cross-sectional study was designed and conducted among a sample of 130 dentist of different dental specialties in Riyadh city, Saudi Arabia, The questionnaires were distributed in the period from February 1st to April 30th, 2018. The questionnaire was design according to similar studies that were published by R. J. Oliver et al. and Zahid Iqbal et al.

A pilot study was first carried out on 60 dentists with different characteristics to assess its clarity and feasibility. Results of the pilot study revealed that the questionnaire was easy to understand and fill-up and it took about 5–10 minutes to complete. Thus, no further adjustments were recommended. A questionnaire was distributed thereafter to a convenient sample.

The data was collected, summarized, and coded. All statistical analyses were performed with the Statistical Package for Social Sciences (SPSS) program (version 20). The following descriptive statistics were performed: frequency distribution tables and chai-square test. P value ≤ 0.05 was considered statistically significant.

Table 1: Assessment of Dentists' Knowledge towards use of Antifungals

Questions	Answer
Gender	Male Female
Experience (years)	Less than 2, 2-5, 5-10, 10+
Nationality	Saudi, Non Saudi
Clinic Setting	Governmental Teaching (University) Military Private
Specialty	General dental practitioner Postgrad student Saudi board resident Specialist Consultants
How often do you consult on a patient with oral Candidiasis?	Daily, Weekly, Monthly, Yearly
In patient with oral candidiasis, which rout of administration of antifungals do you prefer to use? :	Topical Systemic
For topical antifungal treatment of oral candidiasis, which of the followings antifungals you most frequently prescribe? (You can choose more than one)	Nystatin suspension ,Nystatin suspension ,Fluconazole cream , Miconazole Oral Gel , Amphotericin B lozenges
For systemic antifungal treatment of oral candidiasis, which of the followings antifungals you most frequently prescribe? (You can choose more than one)	Oral fluconazole ,Oral amphotericin , Intravenous echinocandin Intravenous amphotericin B
In patient with oral candidiasis, which adjunct therapy of the followings you frequently prescribe?:	chlorhexidine., Povidone iodine, Normal saline
In the treatment of candidiasis by a fluconazole susceptible infection, which dosage is correct?	Fluconazole 100mg 3 times weekly Fluconazole 200mg 3 times weekly Fluconazole 100-200mg daily, for 7-14 days Fluconazole 200-400mg daily, for 7-14 days
In the treatment of candidiasis with nystatin, which dosage is correct?	Nystatin suspension 100000 U/mL 4 times daily Nystatin suspension 200000 U/mL 4 times daily Nystatin pastilles 100000 U 4 times daily Nystatin pastilles 200000 U 2 times daily
Challenges you may face regarding prescribing or counseling Antifungals	Lack of knowledge about their indications. Lack of knowledge about their dosing. Lack of knowledge about interactions with other drugs. Lack of knowledge about interactions with food.

Result

A total of 130 completed questionnaires were received. 96.9% Saudi and 3.1% non-Saudi, 55.4% were male and 44.6 were female, 48.5% had less than 2 years of practice experience, 33.8 had from 2-5 years of experience, 9.2% from 5-10 years and 6.9% more than 10 years of experience. Regarding their categories 36.9% were postgraduate students and 53.1 were general practitioners and 10% were specialists and consultants Regarding to the dentist's specialty 51.5 % were general practitioners, 13.8% were oral medicine specialists and maxillofacial surgeons, 10.8% were periodontists ,10% were endodontist, 7.7 % were endodontists 1.5% were

prosthodontists and restorative dentists, 3.1% were orthodontists. 46.2% had lake of knowledge about their dosage, 18.5% lack the knowledge about their indications and 15.4% % lack the knowledge about their drug interactions.

Chai-square test it detected a significance between the different specialties who answered the following questions: 0.002 for the question "how often do you consult on a patient with oral candidiasis?), 0.000 for the question (For topical antifungal treatment of oral candidiasis, which of the followings antifungals you most frequently prescribe?), 0.020 for question (Challenges you may face regarding prescribing or counseling Antifungals?)

Table 2, Q1 : how often do you consult on a patient with oral candidiasis ?

Specialty	Percentage %
Pedodontist	7.69 daily
	7.69 monthly
	84.6 1 yearly
Endodontists	10 monthly
	90 yearly
Restorative Dentists	100 yearly
Orthodontists	100 yearly
Periodontists	14.28 daily
	21.42 monthly
	64.28 yearly
Oral Medicine Specialists and Maxillofacial Surgeons	5.55 weekly
	27.7 monthly
	66.66 yearly
General Dentists	4.47 weekly
	29.58 monthly
	64.17 yearly

The level of significant is .002 according to chi square test

Table 3, Q2 : For topical antifungal treatment of oral candidiasis, which of the followings antifungals you most frequently prescribe?

Answer : nystatin suspension

Specialty	Percentage %
Pedodontists	84.61
Endodontists	30
Periodontists	35.71
Oral Medicine Specialists and Maxillofacial Surgeons	50
General Dentists	61.19
Restorative Dentists	50

Table 4, Q2 : Answer : fluconazole cream

Specialty	Percentage %
Endodontists	30
Oral Medicine Specialists and Maxillofacial Surgeons	16.66
General Dentists	4.47

Table 5, Q2 : Answer : miconazole oral gel

Specialty	Percentage %
General Dentists	10.44
Endodontist	30
Oral Medicine Specialists and Maxillofacial Surgeons	11.11
Periodontists	7.14
Orthodontists	25
Pedodontists	7.69

Table 6, Q2 : Answer : nystatin suspension + fluconazole cream

Specialty	Percentage %
General Dentist	11.94
Periodontists	14.28

Table 7 , Q2 : Answer : nystatin suspension + miconazole oral gel

Specialty	Percentage %
Endodontists	10
Periodontists	14.28
Oral Medicine Specialists and Maxillofacial Surgeons	11.11
General Dentist	2.98

Table8, Q2 : Answer : nystatin suspension + amphotericin b lozenges

Specialty	Percentage %
Orthodontist s	25
Oral Medicine Specialists and Maxillofacial Surgeons	5.55
General dentists	2.98
Periodontists	14.28

The level of significant is .000 according to chi square test.

Table 9, Q3 : Challenges you may face regarding prescribing or counseling Antifungals . A1 : Lack of knowledge about their indications

Specialty	Percentage %
Pedodontist	15.38
Endodontist	30
Oral Medicine Specialists and Maxillofacial Surgeons	33.33
General Dentists	13.43
Prostodontists	50
Periodontists	7.14
Orthodontists	25
Restorative Dentists	50

Table 10, Q3 : Challenges you may face regarding prescribing or counseling Antifungals . A2 : Lack of knowledge about their dosing

Specialty	Percentage %
Pedodontists	38.46
Endodontists	50
Restorative Dentists	50
Orthodontists	25
Periodontists	50
Oral Medicine Specialists and Maxillofacial Surgeons	50
General Dentists	47.76

Table 11, Q3 : Challenges you may face regarding prescribing or counseling Antifungals . A3 : Lack of knowledge about interactions with other drugs.

Specialty	Percentage %
General Dentists	23.88
Oral Medicine Specialists and Maxillofacial Surgeons	11.11
Periodontists	7.14
Endodontists	10

The level of significant is .020 according to chi square test.

Discussion

Oral candida has been classified into primary and secondary classification. Primary oral candida is subclassified into acute (pseudomembranous and erythematous), chronic (pseudomembranous, erythematous and hyperplastic) and candida associated lesions.(7) For mild cases of oral candida, topical antifungal agents are recommended and adequate.(8,9) According the result of this study 85.4% of dentist used topical antifungal to treat patients with fungal infection which around the percentage of study that was published by Martinez-Beneyto Y of 83% and higher than Ali Hafezeqoran result of 77% (22, 23)

Nystatin medication is a polyene antifungal agent that is derived from the Streptomyces species.(11) Nystatin was present in different type like cream, ointment, lozenge, oral suspension, or vaginal tablet. The nystatin lozenge has a long action time and contains high level of glucose, which can increase the risk for dental caries.(10) Nystatin cream and ointment is usually used by apply it three to four times daily and for Suspension: 100 U four times daily.(18) For antifungal medication 55.4% of participants prescribed nystatin suspension which is first most common medication of choice in this study but has lower percentage of study was done by Mohammad H. Al-Shayyab et al. , R. J. Oliver et al. , Ali Hafezeqoran et al. and Martinez-Beneyto Y (1, 21-23) On the another hand, a study that was published by Martinez-Beneyto Y, nystatin become a second medication used by percentage around 57.70 % (22), which is similar to study done by (Anand, et al., 2016) around 23% (19)

84,61% of Pedodontists and 61.19 % of general dentists selected the nystatin as chose of topical antifungal treatment and regarding the dose for nystatin suspension 51.5% selected 100000 U/ml 4 Times daily, 23.1% select 200000 U/Ml 4 times a day which is higher percentage than Ali Hafezeqoran et al. study.(22) A published study by Anand, et al. shown the majority of nystatin prescription was prescribed by prosthodontists.(19)

Another topical antifungal medication is Amphotericin B can treat local oral fungal infection. It can be used by apply it as an ointment, cream, or lotion three to four times daily for a maximum of 2 weeks (12,13). In this study low percent of dentist select this medication combined with nystatin as chose of antifungal treatment similarly to previous studies.(19,21) In our study 12.3 % of dentist selected Amphotericin B, this percentage was consider as similar result of previous studies done by Al shayyab et al. 13.3% but lower than study that was done by Richard Oliver et al. 37%. (1, 21)

Miconazole is another topical antifungal agent that also functions as an anti-staphylococcal agent. It has fungistatic properties, inhibiting ergosterol synthesis in the fungal plasma membrane.(14) In this study the miconazole is the second choice of medication selected by dentists. It's supplied as a gel, cream, ointment, or lacquer. The gel is used by apply it three to four times daily for 2 to 4 weeks. The cream is applied twice daily for 2 to 3 weeks.(15,16) Only 11.5% of dentists in this study selected this agent to treat oral fungal infections which is lower than the result of previous studies conducted by Mohammad H. Al-Shayyab et al. 62.4% , Richard Oliver et al. 45% and Martinez-Beneyto Y 59, 30 %. (1, 21, 23)

Fluconazole cream as topical antifungal agents is the third medication of choice in this study but for systemic oral fluconazole 58.4% of dentists in this study selected systemic antifungal agent which is a higher percentage than other reported percentages by previous studies; Mohammad H. Al-Shayyab et al. 10.9%, Richard Oliver et al. and Martinez-Beneyto Y.(1, 21, 23) Fluconazole can be taken with an initial loading dose of 200 mg on day 1, and then daily for 7 to 14 days in various doses: 50 mg/kg/day, 100 mg/kg/day, 150 mg/kg/day, 200 mg/kg/day, or 3 mg/kg/day (17,9)

The result of this study shown 43.1% of dentists selected 100-200mg daily, 7-14days which is higher percentage than the study done by Ali Hafezeqoran et al.(22) and 27.7% of participants selected 100mg 3 times weekly, 14.6% selected 200mg 3 times weekly.

Chlorhexidine gluconate at a concentration of 0.2% it used in dental clinical practice as an antiseptic oral rinse due to its activity against a wide range of oral microbial species including Candida.(20) In this study the result show for the adjunct therapy 70.8% chlorhexidine and 20% normal saline . but in previous study chlorhexidine was prescribed by dental practitioners (16%) along with other antifungal agents as an adjunctive therapeutic agent. (19)

Conclusion

The annual presentation of patients with oral fungal infections in the dental clinic is considered very low. Most dentists will start with topical antifungal agents, nystatin suspension is the first medication of choice follow by miconazole and for the systemic antifungal agents oral fluconazole is first medication of choice. As for the adjunctive therapy most participants prescribed 0.2% chlorhexidine gluconate mouthwash. However, when it comes to the prescribed dosage of each

antifungal agent, some participants lacked the proper knowledge and therefore, revising the current recommended dosage before prescribing any agent is advisable.

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