

Knowledge of Dentists about Tuberculosis in Shiraz, 2014

Original Article

Fatemeh Lavaee¹, Zahra Ranjbar², Mohsen Pakari³

^{1,2}Assistant Professor, Department of Oral Medicine, Shiraz University of Medical Sciences, Shiraz, Iran.

³ Student, Shiraz University of Medical Sciences, Shiraz, Iran.

Received: May 11, 2015

Accepted: Aug 17, 2015

Corresponding Author:

Zahra Ranjbar

Address:

Department of Oral Medicine, School of Dentistry, Shiraz University of Medical Sciences, Shiraz, Iran.

Email: Z_ranjbar@sums.ac.ir

Zahra_ranjbar82@yahoo.com

Telephone: +987136289917

Fax: +987136270325

Abstract

Introduction:

Tuberculosis (TB) is an infectious and contagious disease caused by mycobacterium tuberculosis. Dentists are susceptible to TB. Thus, the aim of this study is to evaluate the knowledge and attitudes of dentists regarding TB.

Materials and methods:

This cross-sectional and descriptive-analytic study evaluated the knowledge of 120 dentists regarding TB. Using a questionnaire the queries were divided into three categories: 1) general aspects of TB, 2) treatment of TB, and 3) drug interactions and dental management of patients with TB. The relation existing among different categories of the questionnaire and the relation between dentists' gender and their TB knowledge about were evaluated using the Mann-Whitney test.

Results:

A positive correlation between the dentist's knowledge about treatment and drug interaction domains and their age and experience was demonstrated, although general aspects and total score were not affected by aging.

There was no significant difference between the knowledge about general aspects of TB and its treatment and drug interactions; however, a significant difference was found between dental management and the knowledge about general aspects of TB ($p = 0.040$).

Conclusion:

This study concluded that the dentists' knowledge about TB is poor. Hence, promoting this knowledge among these professionals is necessary.

Key words:

•Tuberculosis •Knowledge •Infectious Disease

Introduction

Tuberculosis (TB) is a major world health problem and one of the oldest diseases afflicting humanity. TB is transmitted by an infectious agent named *Mycobacterium tuberculosis*.

It is known that improper social and economic factors, high prevalence of AIDS, immigrants afflicted with TB and immune suppression are the most important factors adversely affecting the prevalence of this infectious disease.⁽¹⁾

Dentists are more susceptible to the risk of being infected with TB.⁽¹⁾ Well informed dentists can protect not only themselves but also their health care workers and patients against TB, they can also diagnose the disease better. Previous studies reported that dentists and their health care workers do not show enough knowledge about TB.

Naidoo and his colleague, in South Africa, reported that only 31% of dentists had the experience of referring patients with TB suspect to a hospital for diagnosis and treatment.⁽²⁾ In another study in Tehran, it was reported that general dentists lacked the proper knowledge to diagnosing TB.⁽³⁾ Researchers in Uganda pointed out the essential need for interns to improve their knowledge and attitude concerning infection control.⁽⁴⁾ Additionally, other authors reported that dentists demonstrate low information about the infectious pathogen transmission routes.⁽⁵⁾

To the best of our knowledge, there were few studies conducted on this subject in the dentistry field. Because of the low level of awareness of health care workers and dentists⁽²⁻⁵⁾ and the need for evaluating the educational system quality, we decided to survey the knowledge of dentists in Shiraz when detecting patients with TB. This study evaluated the effects of gender, age, and working experience of Shiraz dentists on their knowledge about TB.

Materials and Methods

This is a descriptive-analytic cross-sectional study, and the data were obtained by providing questionnaires to general dentists in Shiraz in 2014. Sample size was estimated according to the Taheri's research in Tehran and had initially⁽³⁾ 150 volunteers. Sample randomization was made according to the registered list of general dentists in Shiraz branch of Medical (dental) Council. According to this list and by means of

random number tables we chose 150 general dentists and attended to their offices according to their registered addresses. Dentists who agreed to participate were included in the study, and they answered the questionnaire. Dentists who were not at their office by the time the researcher attended and could not be found at any other appointment were excluded from the study along with the ones who failed to fill out the questionnaire. Finally, 120 dentists participated effectively of this study.

Participants were asked to complete the questionnaire on the same day on which it was given to them. The questionnaire used herein was the same employed in Taheri's study⁽³⁾, and its validity and reliability were confirmed with acceptable Alpha Cronbach (0.64) (internal consistency or reliability) and Spearman–Brown coefficient (0.65). In the above mentioned study, correlation coefficient showed acceptable reliability (0.656). The questionnaire consisted of 18 multiple choice queries separated in three categories (each one containing 6 questions):

1) general aspects of TB, 2) treatment and drug interaction in TB and 3) dental management of these patients. Each question had five possible choices, including the answer "I do not know" as the fifth option. Each correct response received a positive point and each incorrect response, a negative point.

For statistical analysis, SPSS (version 17) was used. The Kruskal–Wallis test was used to estimate the statistical relation existing between the different categories of the questionnaire (general aspects of TB, treatment and drug interaction in TB, and dental management).

The association between gender and dentists' knowledge was evaluated using the Mann–Whitney test. In addition, the relation between the age, working experience, and knowledge of participants were assessed by the Spearman's correlation coefficient.

Results

The sample size was statistically sufficient for conducting the analysis. Of the 150 randomly selected patients, a total of 120 participants participated in the study, of these 52% (62 dentists) were male with mean age of 30.45 ± 10.19 years, and 48% (58 dentists) were female with mean age of 30.10 ± 8.39 years. The average time of

dental practice work was 6.11 ± 5.73 years, the minimum and maximum experience time ranged from one to 30 years, approximately.

The frequency of the answers to each of the three categories of the questionnaire is presented in Tables 1–3. The average grade of total knowledge of participants is 5.62 ± 2.55 . The scores in the sections of general aspects, drug interactions, and dental management were 2.47 ± 1.35 , 1.62 ± 1.22 , and 1.76 ± 1.00 , respectively.

Table 4 demonstrates the information participants had in the three categories separately.

Males and females appeared to demonstrate differences regarding their scores on dental management and treatment and drug interaction. Knowledge scores of male dentists about dental management (male 1.95 ± 1.01 , female 1.6 ± 0.96 , $p = 0.04$) and treatment and drug interaction (male 1.93 ± 1.22 , female 1.23 ± 1.15 , $p = 0.004$) were significantly higher than those of female dentists. Concerning the general aspects, male and female scores (male 2.23 ± 1.31 , female 2.36 ± 1.41 , $p = 0.937$) and total grades

(male 6.12 ± 2.63 , female 5.18 ± 2.37 , $p = 0.078$) were not statistically significant.

There was a statistically meaningful relation when considering age ($p = 0.015$, $r = 0.227$) and duration of dental practice ($p = 0.006$, $r = 0.295$) with the category of treatment and drug interaction. Knowledge in the category of treatment and drug interaction appeared to be greater in the older and the more experienced dentists than that in others.

Kruskal–Wallis test showed meaningful differences between the three categories (general aspect of TB, treatment and drug interaction in TB, and dental management) ($p = 0.026$).

There was a significant difference between the scores in the category of general aspects of TB and dental management ($p = 0.04$); however, the differences between the general aspect of TB and drug interaction ($p = 0.253$), the drug interaction and dental management in patients with TB ($p = 0.358$) were not statically significant.

Table 1. Answers of dentists to general aspects of TB

Question	Correct answer	a	b	c	Not knowing	False and not knowing	
1-Infectious patients for TB	Frequency	b	19	55	7	39	65
	Percentage		15.8	45.8	5.8	32.5	54.2
2-When tuberculin tests will be positive	Frequency	a	57	18	12	33	63
	Percentage		47.5	15	10	27.5	52.5
3-The most common site for oral TB	Frequency	a	30	41	24	25	90
	Percentage		25	34	20	20.8	75
4- The meaning of positive tuberculin test	Frequency	c	2	14	71	33	49
	Percentage		1.7	11.7	59.2	27.5	40.8
5-An area of induration which is considered positive	Frequency	c	19	30	27	44	93
	Percentage		15.8	25	22.5	36.7	77.5
6-The frequency of tuberculin test performing	Frequency	b	20	32	33	35	88
	Percentage		16.7	26.7	27.5	29.2	73.3

Table 2. Answers of dentists to the treatment and drug interaction aspects of TB

Question		Correct answer	a	b	c	Not knowing	False and not knowing
7- The medication can be prescribed for prophylaxis of suspected patients to TB	Frequency		45	31	5	39	75
	Percentage	a	37.5	28.8	4.2	32.5	62.5
8- drug interaction of Isoniazide	Frequency	a	57	18	12	33	63
	Percentage		47.5	15	10	27.5	52.5
9- drug interaction of Rifampin	Frequency	b	17	21	26	56	99
	Percentage		14.2	17.5	21.7	46.7	87.5
10- Which drug prescribed for TB Can cause leucopenia and thrombocytopenia	Frequency		25	26	13	56	95
	Percentage	a	20.8	21.7	10.8	46.7	79.2
11- Drug interaction of streptomycin	Frequency	a	38	12	19	51	82
	Percentage		15.8	25	22.5	36.7	77.5
12- Disinfectant for TB bacillus	Frequency	b	20	32	33	35	88
	Percentage		31.7	10	15.8	42.5	63.3

Table 3. Answers of dentists to dental management aspects of TB

Question		Correct answer	a	b	c	Not knowing	False and not knowing
13- Dental management of active patients with TB	Frequency	a	48	18	29	25	72
	Percentage		40	15	24.2	20.8	60
14- using Rubber dam for patients with TB	Frequency	a	81	10	17	12	39
	Percentage		67.5	8.3	14.2	10	32.5
15- Dental management of children under 6-year-old	Frequency		45	41	8	26	112
	Percentage	c	37.5	34.2	6.7	21.7	93.3
16- minimum duration of treatment for TB to perform dental management safe	Frequency		13	34	25	48	95
	Percentage	c	10.8	28.3	20.8	40	79.2
17- minimum duration of necessary drug therapy	Frequency		16	34	18	52	104
	Percentage	a	13.3	28.3	15	43.3	86.7
18- dental management of PPD ¹ Positive patient without clinical symptom	Frequency		15	34	21	50	86
	Percentage	b	12.5	28.3	17.5	41.7	71.7

¹PPD: purified protein derivative

Table 4-The grade of participants

Grade	Mean	Standard deviation	Middle	Minimum	Maximum
Total	5.62	2.55	5	0	14
General aspects	2.74	1.35	2	0	6
Treatment and drug interaction	1.62	1.22	2	0	5
Dental management	1.76	1	2	0	4

Discussion

Considering the category of general aspects of TB, approximately half of participants (54%) had not enough information about patients presenting high contagious risk and the time needed for the tuberculin test appeared positive.

In contrast, participants had an acceptable concept about positive tuberculin test (59%) (previous infection with or without presence of active infection,⁽⁶⁾ although they could not explain the result of the test (26.7%) and did not know the importance of/ dentists taking the test once a year (22.5%). Only 37.5% of dentists answered the questions about prophylaxis⁽⁷⁾ of TB correctly. Acetaminophen is usually prescribed for pain control in dentistry, but dentists had not enough information about the interactions of this painkiller with the general aspects of the disease in patients with TB.

TB prescribed medication has some side effects on different blood cells, causing leucopenia and thrombocytopenia.^(1,8) Although some oral manifestations and some dental treatments are directly related with the level of white blood cells or platelets, the results of this study showed that dentists rarely have enough awareness on this matter (20.8%).

The procedures of infection management control in private offices are of responsibility of dentists and their health care workers, so it is important for them to be aware of the effective disinfectant process⁽⁹⁾ to prevent the presence of TB bacillus. In contrast to most of other issues, dentists were familiar with the essential need of using rubber dam in all dental treatments (67%).⁽¹⁰⁾ But most of them did not know which patients were allowed to be admitted for dental treatment (40%). Cavity inducing diseases are rare in children younger than 6 years old and they are incapable of produce sputum, consequently these patients are considered as noninfectious and dentists can render dental treatment. In contrast, patients with active clinical TB should not receive outpatient treatment.^(1,7,11-13) According to the results of this study, the need for better practical education is obvious.

To the best of our knowledge, previous studies on this matter are limited to small data research conducted on TB. Most of these evaluated the knowledge and attitude of dentists about the in-

fection control procedure.

Naidoo and his coworker assessed the role of dentists in infection control and preventing TB transmission. They enumerated the following measures for protecting dentists: using high power ventilator, disinfection by radiation or perfect self-protection process including the use of mask (78% of dentist use mask), gloves (92%), rubber dam (11%), and protection glasses (50%). As the results of our study showed, dentists had acceptable information about the necessity of using rubber dam but more research is required for assessing their practical function.

However, they had low level of knowledge about symptoms, risk factors, susceptible patients and diagnostic laboratory tests.

Naidoo and his coworker also reported that only 31% of patients suspected with TB infection were referred to the specialist for further evaluation.⁽²⁾

Similarly, in Poland, Burge and coworkers declared very low level of information about this subject. Although they did not consider gender and place of study, they emphasized the importance of improving educational programs.⁽¹⁴⁾

Taheri and her colleagues performed the same research in Tehran. The highest grade of information achieved in their study (grade 11) was approximately the same as the results were found herein (grade 14), both presenting very weak knowledge about different aspects of TB.⁽³⁾ In Taheri's research, dental management, general aspects of TB in this study, had better knowledge status.⁽³⁾ According to the similar mean range of participants' age and experience in both studies, this difference can be explained by personal factors of volunteers.

Neither of the studies reported significant difference between male and female knowledge, but in our study, male participants were significantly more aware of treatment and drug interaction ($p = 0.004$) and dental management ($p = 0.04$). This might be related to the fact that male dentists demonstrate more courage in treating complex dental cases. Thus, they may need to receive more information, particularly about drug interactions and dental management.

Taheri's study confirmed the positive effect of age and time of practice on the knowledge of participants.⁽³⁾ This effect was also found in the

category of drug interaction in the present study. The dentists with more experience have better knowledge of the issues studied herein. Comparing the information participants had at their disposal regarding the three categories discussed earlier, Taheri and her colleague found significant differences between these categories, except for general aspects of TB in comparison with drug interaction.⁽³⁾ In the present study, significant differences were observed between general aspects of TB and dental management. The explanation of this difference is challenging because the mean age and experience range of participants were very similar. Although we tried to select sufficient sample size, some dentists refused to participate in the research, in addition, a few participants failed to answer the questions accurately. Ultimately, 120 questionnaires were filled out completely after repeated referrals. For future studies, we suggest to evaluate the types of equipment which are needed for treating patients with TB appropriately at an office or clinic, and also to estimate the percentage of admitted patients with TB who can receive outpatient treatment.

References

1. Little JW, Falace D, Miller C, Rhodus NL. Dental management of the medically compromised patient. 8th ed. USA: Elsevier; 2013.p.108-16.
2. Naidoo S, Mahommed A. Knowledge, attitudes, behavior and prevalence of TB infection among dentists in the western Cape. *J South African Den Assoc* 2002;57(11):476-8.
3. Taheri J, Maleki Z, Alavi K, et al. Knowledge and attitudes of Tehran dentists about TB in 2006-2007. *J Dent Faculty Shahid Beheshti Univ* 2007;24(2):200-11.
4. Kamulegeya A, Kizito AN, Balidawa H. Ugandan medical and health sciences interns' infection control knowledge and practices. *J infec developing countries* 2013;7(10):726-33.
5. Epstein JB, Mathias RG, Gibson GB. Survey to assess dental practitioner's knowledge of infectious disease. *J Canadian Dent Assoc* 1995;61(6):519-25.
6. Scott-Thomas A, Syhre M, Epton M, et al. Assessment of potential causes of falsely positive Mycobacterium tuberculosis breath test. *Tuberculosis* 2013;93(3):312-7.
7. Society AT. Diagnostic standards and classification of tuberculosis in adults and children. *Am J Respir Crit Care Med* 2000;161:1376-95.
8. Koul A, Arnoult E, Lounis N, et al. The challenge of new drug discovery for tuberculosis. *Nature* 2011;469(7331):483-90.
9. Walker DR, Paulson L, Jenkins L. Disinfection/sterilization in U.S. dental practices--practice behavior and attitudes. *General dent* 1998;46(3):290-3.
10. Klasco R. USP DI Drug information for the healthcare professional. USA: Greenwood Village CO, Micromedex Inc; 2006.
11. Sonis S, Fazio RC, Fong L. Principles and practice of oral medicine. Philadelphia: WB Saunders Co; 1984.p
12. Heir J, Ziccardi VB. Transmission of infectious disease in the dental setting. *Mount Sinai J med* 1998;65(5-6):378.
13. World Health Organization. Guidance for national tuberculosis programmes on the management of tuberculosis in children. Switzerland: WHO; 2014.
14. Burger MS, Abraham-Inpijn L, Vissink A. An inventory of knowledge on tuberculosis among dentists in the Netherlands. *Ned Tijdschr Tandheelkd* 2012;119(3):140-3.

Conclusion

The level of dentists' knowledge about several aspects of TB was unfortunately very poor. In all the studies including this one, we observed that the participants had insufficient information about TB. For improving the knowledge of dentists, more educational courses and proper short extracts in the form of the leaflet, CD or book regarding this systemic disease should be provided.

Acknowledgments

Our best regards to Vice Chancellor of Research Affairs and Student Research Committee, Shiraz University of Medical Sciences of Iran for their very kind cooperation in preparing this manuscript. In addition, we thank Dr. Mehrdad Vossough for statistical analysis. There is no conflict of interest. This article has been extracted from doctoral thesis #92-01-21-6750, Dr. Mohsen Pakari of school of Dental Medicine, Shiraz University of Medical Science, Shiraz, Iran.