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An Evaluation of Practitioner's Understanding of the Relationship Between Eye and Dental Health

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ABSTRACT

Background: According to several studies, eyesight may be impacted by dental health, including the condition of your teeth and gums. Hence awareness of correlating factors of ocular and dental disease is necessary among eyecare and dental care providers, so they can spread the awareness to patients.

Methodology: A self-administered questionnaire was developed after focus group discussion. Dentists and ophthalmologists in Mumbai and Navi Mumbai received the Survey Monkey questionnaire, which was distributed through emails and in-person meetings.

Results: 245 practitioners responded to the survey, including 125 dentists and 120 ophthalmologists. According to the survey, 62.18% of ophthalmologists and 34.40% of dentists are aware of the link between poor dental health and the eyes. Years of experience and knowledge of dentists were not correlating ($p > 0.05$), whereas years of experience and knowledge of ophthalmologists were correlating ($p<0.05$) regarding the relationship between poor oral health and eye.

Conclusion: Ophthalmologists have encountered more instances of ocular issues caused by poor dental health than dentists. Thus, the present brief survey concludes that dental care provider needs more awareness about eye disease caused by dental issues. Both respective fields can provide awareness to patients for better quality of life.

1. Introduction

Numerous case histories show a direct etiological link between mouth-based infection foci and inflammatory conditions of the eye (Gillett, 1930). It has been acknowledged that some oral health issues may itself cause or worsen certain general health issues, most notably or probably leading to diabetes, eye disease, cardiovascular, and respiratory issues (Evans & Kleinman, 2001; Pace & McCullough, 2010). According to certain research, those with oral inflammation also developed central retinitis (Sepic *et al.*, 2008).The link between uveitis and dental infections was also shown to be statistically significant (Ignat *et al.*, 2001).When the case report suggested that gingival fibromatosis is linked to several ocular problems, an overview of pertinent research and their findings is offered (Pockpa et.al., 2017). POAG [primary open angle glaucoma]: It is a chronic illness that is the main cause of blindness in the world and is defined by the neurodegeneration of retinal ganglion cells and their axons (Astafurov *et al.*, 2014). In a case-control study with African Americans that was conducted in clinics. 58 patients with glaucoma had considerably higher oral bacterial loads and significantly fewer teeth than 45 controls (Polla *et al.*, 2017). The same research team discovered that microglial activation followed glaucomatous neurodegeneration. These findings imply that infections that might cause periodontal disease may have systemic implications that can result in POAG (Astafurov *et al.*, 2014). Dental infections may lead to issues that affect the eyes, including impaired vision, retinal disorders, and blindness (which might be temporary or permanent) (Resnikoff *et al.*, 2004; Augood *et al.*, 2006; Barouch & Miller, 2007). There are currently limited standards for addressing and preventing such ocular issues. However, there are very limited recommendations in the dentistry curriculum on how to avoid and treat ocular issues brought on by tooth infections, and unexpectedly, there are limited studies on ocular complications caused by oral infections in the dental literature. Researchers have discovered that your entire dental health, including the condition of your teeth and gums, may significantly impair your ability to see (Shaju *et al.*, 2011; Chandra *et al.*, 2016). According to those studies, tooth decay, gum disease, and

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teeth with old mercury fillings are the most common dental issues that affect the eyes (Hunsigi *et al.*, 2016).

2. Material and Methodology:

The Institutional Ethics Committee of Lotus College of Optometry and Eye Hospital, Mumbai, India approved the study protocol. Informed consent was obtained from all participants before interviews commenced. The study was a cross-sectional survey, using convenience sampling among ophthalmologist and dentist of Mumbai, Maharashtra, India. In the pilot study, brief survey was conducted with ophthalmologists and dentists to find out whether they had seen any instances demonstrating the link between poor dental health and the eye. The relationship between poor dental health and its impact on the eyes has been studied, and a self-administered questionnaire was developed by focus group discussion to capture this information. For focus group discussion a diverse group of Dentists and Ophthalmologists with varying years of experience were recruited, after the focus group, data was analysed. Identified the common themes and patterns in the responses and with the use of information survey questionnaire has been developed. A self-administered questionnaire was distributed through survey monkey platform or in person meeting with both Dentist and Ophthalmologist. Some of the questionnaire's questions include multiple-choice responses, while others are of the YES/NO kind. The results of each answer were entered into an excel sheet and sent for further analysis after completion.

3. Results

A total of 245 volunteers participated in the study, out of which 125 were Dentists and 120 were practicing Ophthalmologists. This study collected responses only from practicing professionals and not included any intern or undergraduate students in the same field. **Dentist:** Of 125 Dentists 70 were males and 55 were females, of which (28%) were working in hospitals and (72%) working in private clinics. Most of the participated Dentists are having experience of 5 – 10 years (60.80%) followed by, more than 10 years of experience (37.60%) and 0 – 5 years of experience (1.60%). For Ophthalmologists: In 120 Ophthalmologists 60 males and 60 females, in which (44.17%) was working in hospitals and (55.83%) working in private clinics. Most of the Ophthalmologists are having experience of "more than 10 years of experience (68.33%)" followed by "5 – 10 years about (30.83%)" and "0 – 5 years of experience (0.83 %).

Table 1: Questionnaire and its responses given by Dentists and Ophthalmologists.

Sr.No.	Question	Results (in %)	
		Dentist	Ophthalmologist
1	Do you know that the ocular complication can occur due to dental complication? Yes No Don't know	 34.4 16 64	 62.18 1.68 63.13
2	If yes then, the source of information Personal experience Colleagues Textbooks/ magazine Internet	 18.6 37.21 6.98 37.21	 36.84 40.79 23.37 0
3	Do you notice any ocular complication in a patient with a history of dental infection? Yes No Sometimes	 35.4 64.6 0	 63.06 36.13 0.84
4	If yes, what were the symptoms did you observed in such patients? Loss of vision Blurred vision Constriction of visual field	 11.9 88.1 0	 19.74 78.95 1.32
5	How long the symptoms lasted? Few minutes Few hours Few days Few Months	 0 11.9 64.29 23.81	 0 7.89 53.95 38.16

6	Do you refer to an ophthalmologist for ocular complication? [Question to Dentist only] Yes No	97.62 2.38	
7	As an Ophthalmologist ocular complication due to dental infection are [Question to Ophthalmologist only] Over reported Under reported Adequately reported		22.69 50.42 26.89
8	Do you feel more research and reviews should be carried out and published in journals/books and other literature about ocular complication due to dental infection? Yes No	99.2 0.8	99.16 0.84
9	If you encounter ocular complication due to dental infection, what would be your immediate reaction? Reassurance to the patients, treat dental infection Summon medical emergency Call ophthalmologist Ignore and proceeded with the intended dental procedure	15.2 34.4 44.8 5.6	
10	If you encounter ocular complication due to dental infection, what would be your first line of treatment [Question to Dentist only] Educating the patient for relation and advising to complete the dental treatment properly If patient complaints about visual problem, treating them first Stop the treatment till infection reduces All of the above		10.92 28.75 21.85 38.66

Correlation between knowledge and years of experience was found. The data was entered in MS Excel in numerical form. The analysis was done using SPSS software v26 (IBM Corporation, USA)

In current study no correlation was found for years of experience and knowledge of Dentists ($p > 0.05$). 28 Dentists having "0 – 5 years of experience" said "yes" for the relation, while only 15 Dentists said "yes" having experience of "more than 10 years".

Table 2: Statistical correlation of experience and knowledge of Dentist and Ophthalmologists.

	Dentist	**Ophthalmologist**
N	125	120
Pearson's corelation	0.415	0.649
Significant (2-tailed)	0.266	0.042

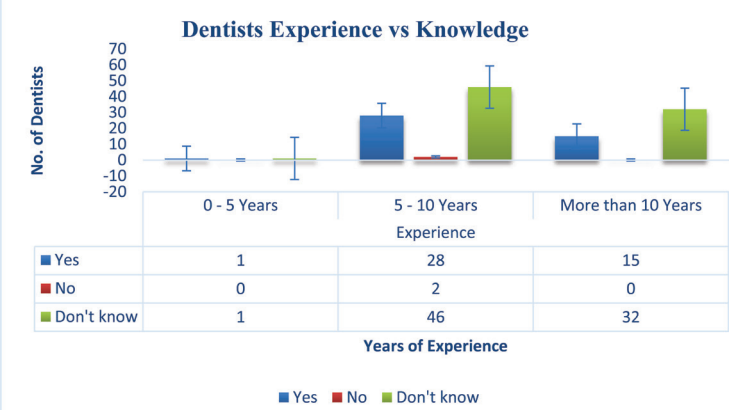

Figure 1: Correlation of experience and knowledge of Dentists.

Positive Correlation was found for years of experience and knowledge of Ophthalmologists on the relation of Poor oral health and eye, ($p < 0.05$). 23 Ophthalmologists said they agree for thus relation of having experience of "5 – 10 years" while 51 Ophthalmologists having experience of "more than 10 years" said yes for the same.

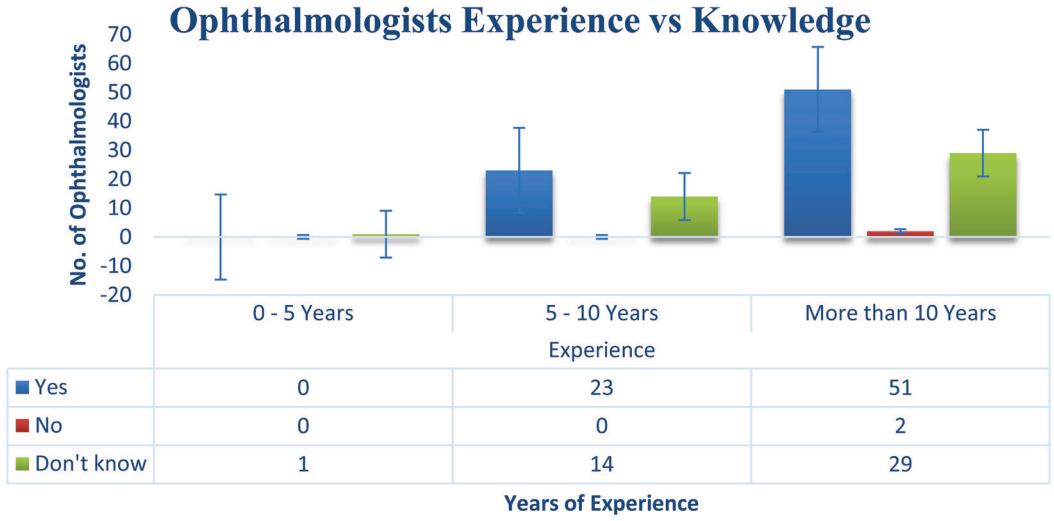

Figure 2: Correlation of experience and knowledge of Ophthalmologists.

6. Discussion

Many respondents in present survey supported the prevention of ocular problems, which is a positive sign for enhancing and expanding preventative services for the general public. Surprisingly, despite their lack of training, dentists in present observation provided patients with ocular complications with appropriate preventative care and treatment. Prospective Study of Oral Health and Risk of Primary Open-Angle Glaucoma in Men was a study carried out by Louis. They found no links between the quantity of teeth having root canals and POAG (Pasquale *et al.*, 2016; Polla *et al.*, 2017). Root canal treatment is often utilized to save teeth for a range of other reasons in addition to the preceding endodontic inflammation caused by dental caries (Eke *et al.*, 2012). Periodontal disease has a different pathophysiology and microbes than endodontic inflammation; in particular, the dysbiosis linked to periodontitis triggers a potent and immediate immune response, whereas the dysbiosis linked to caries encourages demineralization through acidogenic and aciduric mechanisms (Lee *et al.*, 2013). Only 24.2% of participants in the research conducted by Prahalad Husingi were aware of the occurrences of ocular issues owing to oral infection, while 45.7% were uninformed of such difficulties (Hunsigi *et al.*, 2016). In this survey, just 34.40% of dentists were aware that poor dental health and eye health are related, whereas 60 % of dentists were not. Most of the research that have examined attitudes in relation to knowledge levels have concluded that ongoing education is necessary to modify unfavorable attitudes. Although the dentists in current study had a low level of knowledge, they were eager to learn about ocular complications and learn how to prevent them. However, dental curricula have limited preventive strategies for the prevention and initial management of ocular complications caused by dental infection. Nearly 44.80% of dentists report that when they get a patient who meets their standards in their office, they will contact ophthalmologists. In present research, 62.18% of ophthalmologists were aware that consequences from oral infections may develop, but 36.13% of ophthalmologists were not aware of this connection. The association between poor dental health and eyes is "under-reported," according to around 50.42% of ophthalmologists, and 99.16% agreed that there is a need for more accurate information on the subject. In the present study, most ophthalmologists said that if they encounter patients who have both poor oral health and eye complications, they will treat the visual issues first. However, 38.66% chose all the options, including stopping treatment until the infection subsides and preparing the patient for it. Assessment as well as in-depth understanding of the ocular consequences brought on by oral infections are required. Dentists' expertise and outlook contribute to the expansion of preventative measures for eye issues brought on by tooth infection. Ophthalmologists have encountered more of these instances than dentists, yet there are known examples of the relationship between poor dental health and the eyes. According to present observations, dentists' understanding of ocular consequences caused by tooth infection was inferior to that of ophthalmologists,

Competing Interests

The authors declare that no competing interests exist

Ethics Declaration

Ethical clearance number from the institutional ethical committee (LCOO-ETH/PG/2021/8/14-13)

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