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Knowledge and awareness of Endo-Perio lesions among dentists and dental interns in Saudi Arabia

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ABSTRACT

Background: An endo-perio lesion is defined as inflammation on a tooth that is associated with both pulpal and periodontal pathology. Endodontic-periodontic lesions are a clinical difficulty to diagnose and treat properly. According to studies, the awareness and knowledge levels were low in general dentists compared to specialist dentists. This research was done to evaluate knowledge and awareness about Endo-Perio lesion among dentists in Saudi Arabia. *Methods:* In KSA, an observational cross-sectional questionnaire study was done. The study's population consisted of 773 Saudi dentists. Structured self-administrated questionnaires were applied in this research data. Data was entered on the excel program 2016 and then analyzed using SPSS. *Results:* There were 773 respondents in the study. 53.7 percent were between the ages of 20 and 25, and 41.4 percent were between the ages of 26 and 30. Males made up 54.3 percent of the sample, while females made up 45.7 percent. Defective restorations, 58.2 percent vertical root fracture, 53 percent dental caries, 67.4 percent plaque and calculus, 26.6 percent malocclusion, and 23.8 percent reported high heat during endodontic therapy were all indicated as risk factors. *Conclusion:* Dentists and dental interns in Saudi Arabia have a moderate to poor degree of information's and awareness about endo-perio lesions, according to the study. Periodic seminars and workshops for dentists employed in governmental hospitals and private clinics to improve their understanding of EPL might provide better results.

Keywords: Endo-Perio lesions, Prognosis, periodontal Pathology, Endodontic Pathology.

1. INTRODUCTION

Because of its intricate anatomy and physiology, the interaction among tissues that invest and support the tooth structure has long attracted researchers' curiosity. The term "perio-endo lesion" refers to a tooth inflammation that is associated with both pulpal and periodontal pathology (Sonde & Edwards,

2020). Pathways connecting periodontal and endodontic tissues, such as canals, dentinal tubules, and iatrogenic defects, are proposed to be a part in the progression of endodontic infection leading to periodontal breakdown (Sharma et al., 2018). Clinicians face difficulties in diagnosing and prognosing endodontic-periodontal lesions (Singh, 2011). Simring and Goldberg first described the endo-perio lesions and the association between them with the term "retrograde periodontitis" (Raja et al., 2008). Many studies talked about the linking between endo-perio lesions, however, A systematic review study showed that treating the endo-perio lesion will result in a decreased probing depth (Oktawati et al., 2020). For many years, the connection among endo and perio disorders has long been a topic of conjecture, consternation, and debate. Today, More than half of all tooth deaths are caused by pulpal and periodontal infections (Sharma et al., 2018). Several investigations have demonstrated that a close speculative relationship between the periodontal and pulpal tissues. The understanding of disease transmission between these two has become a required protocol for reaching the correct and accurate diagnosis (Alshawwa et al., 2020). The studies reveal that, many students are unaware of the bacterial source of infection in endo-perio lesions. There is also a lack of clarity in the course of therapy for different lesions (Sambandhan et al., 2020).

According to studies, dentists who continue their academic studies at the university had a better level of awareness and understanding regarding endo-perio lesions than dentists who employed in community clinics and private clinics. The awareness and knowledge levels were low in general dentists compared to specialist dentists (Çirakoglu & Karayürek, 2020). Endodontic-periodontic lesions are a clinical difficulty to Dx and management properly. This lesion can show in a variation of ways, including the absence of carious teeth, making diagnosis more difficult (Patel et al., 2017). This article paper designed to measure and analyze dentists' knowledge, awareness and management of Endo-Perio lesions, as there has been no research about this topic in KSA. The main goal of this article is to assess knowledge and awareness about Endo-perio lesion among dentists in Saudi Arabia.

2. MATERIALS AND METHODS

Study design

This is a descriptive survey research; an investigation was made in Saudi Arabia from April 2021-December 2021. This study based on structured questionnaire. The study's population consisted of dentists in Saudi Arabia who works in either governmental or private sectors. This study included the Dental practitioners who are registered in the Saudi minister of health.

Sample size

Sample size is determined with a 95% confidence level using the Qualtrics tool.

Data collection methods and instrument

Data collection completed by pre-designed disseminated questionnaire. Participants filled the containing two sections the first one about demographic feature such as age, gender, specialty and registration in Saudi ministry of health. The second section about, knowledge and awareness level about Endo-perio lesion, the participants were asked about classification, examination methods and prognosis, characteristic features of endo-perio lesions and different treatment modalities, most common bacteria and risk factors also were asked about route of communication and accessibility to the pulp.

Data analysis

SPSS program was used to analysed the data that collected and entered on the excel program. For statements and variables, the frequency, percent, averages, and standard deviations were calculated. Pearson correlation was conducted to test the correlation between awareness and knowledge. Regression test was conducted to test the prediction of demographic factors on awareness and knowledge. A p value of less than 0.05 was judged significant statistically.

3. RESULTS

In table (1); there were 773 respondents in the survey. 53.7% aged between 20- 25 years old and 41.4% between 26- 30 years old. 54.3% of sample was males and 45.7% were females. 54.7% of participants were general dentist, 37.4% were dental intern, 3.5% dental students and 1.3% was prosthodontics.

Table 1 Respondents' demographic characteristics (n=773).

Parameter		No.	Percent
Age	Less than 20	2	.3
	20 – 25 years old	415	53.7
	26 – 30 years old	320	41.4
	31 – 35 years old	25	3.2
	36 – 40 years old	9	1.2
	41 – 50 years old	2	3.
Gender	Male	420	54.3
	Female	353	45.7
Specialty	Dental student	27	3.5
	Dental intern	289	37.4
	General dentist	423	54.7
	Restorative dentistry	17	2.2
	Paediatric	1	.1
	Endodontics	6	.8
	Prosthodontics	10	1.3

Of our studied sample, 53.9% were aware of Simon classification of endo-perio lesions. 52% identified Actinomycetemcomitans as the bacteria most commonly related to endo-perio lesions, 17.8% *T. denticola*, 16.7% *S. mutans*, and 13.5% *S. aureus* as mentioned in Figure (1). Regarding treatment, primary endo secondary perio lesion was informed to be managed as 77.7% reported endodontic therapy followed by periodontal therapy, 15.7% RCT alone, and 6% periodontal therapy followed by endodontic therapy. Treatment of primary perio secondary endo lesion was reported as 43.9% reported endodontic therapy followed by periodontal therapy, 47.1% periodontal therapy followed by endodontic therapy, 5.3% periodontal therapy alone and 3.8% RCT alone. Endo and perio management were used together to treat 36.4 percent of combined lesions, 53.2% reported endodontic therapy followed by Periodontal therapy, and 10.5% reported Periodontal therapy followed by Endodontic therapy.

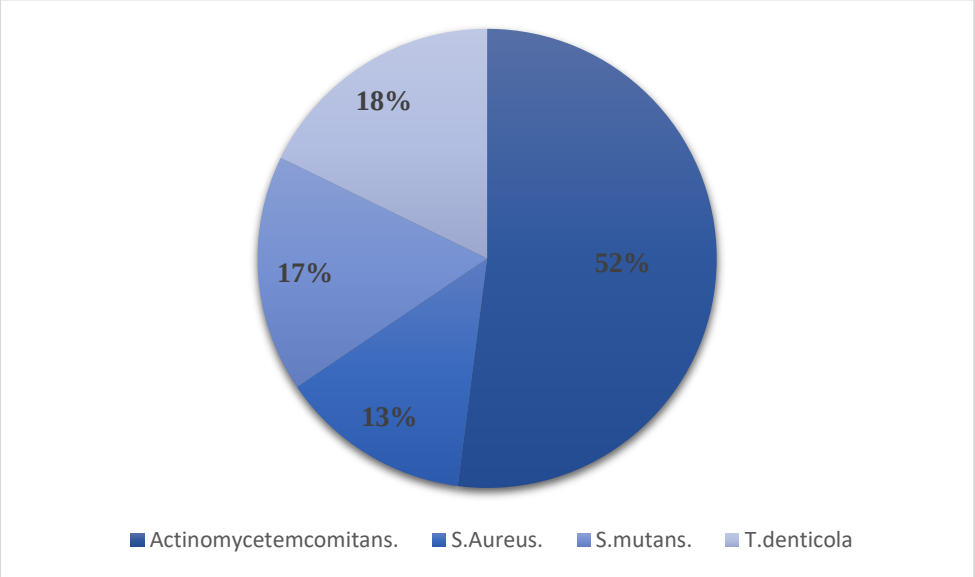

Figure 1 Knowledge of participants about the most common bacteria associated with Endo-Perio lesion.

Regarding risk factors, 58.7% of our studied sample reported defective restorations, 58.2% vertical root fracture, 53% dental caries, 67.4% plaque and calculus, 26.6% malocclusion, and 23.8% reported excessive heat during endodontic therapy. About prognosis, 57.5% of participants think that prognosis of true combined lesion is questionable the majority of times, 30.9% reported

poor or hopeless prognosis and only 11.5% reported good prognosis as illustrated in table (2). The most direct route of Communication pathway between pulp and periodontal tissue was informed to be apical foramen by 49%, lateral canals 39.8%, dentinal tubules 7.8%, and dental caries 3.4%. The most common examination method for Dx of endodontic lesion (primary type) was reported as vitality test by 75.3%, radiograph by 14.7% and percussion test by 10%. Most characteristics feature of primary periodontal lesion were identified as bone loss and deep pocket depth by 95.3%, caries by 2.8% and root perforation 1.8%. Also, in table (2); 89.5% reported that host defense mechanism considered as a factor affecting extend of periodontal destruction and 86.8% reported bacterial products and toxins may obtain entry to the pulp by way of exposed dentinal tubules.

Table 2 Knowledge and awareness of participants of Endo-Perio lesions (n=773).

Parameter		No.	Percent
Are you aware of Simon classification of endo-perio lesions?	Yes	417	53.9
	No	356	46.1
The most common bacteria associated with endo-perio lesion?	Actinomycetemcomitans.	402	52.0
	S. Aureus.	104	13.5
	S. mutans.	129	16.7
	T. denticola	138	17.8
Treatment of primary endo secondary perio lesion?	Endodontic therapy followed by Periodontal therapy.	601	77.7
	Periodontal therapy alone.	5	0.6
	Periodontal therapy followed by Endodontic therapy.	46	6.0
	RCT alone.	121	15.7
Treatment of primary perio secondary endo lesion?	Endodontic therapy followed by Periodontal therapy.	339	43.9
	Periodontal therapy alone.	41	5.3
	Periodontal therapy followed by Endodontic therapy.	364	47.1
	RCT alone.	29	3.8
Management of combined lesions	Together Endodontic and Periodontal therapies simultaneously.	281	36.4
	Endodontic therapy followed by Periodontal therapy.	411	53.2
	Periodontal therapy followed by Endodontic therapy.	81	10.5
The most direct route of Communication pathway between pulp and periodontal tissue	Apical foramen.	379	49.0
	Dental caries.	26	3.4
	Dentinal tubules.	60	7.8
	Lateral canals.	308	39.8
Prognosis of true combined lesion frequently?	Good.	89	11.5
	Poor and hopeless.	239	30.9
	Questionable	445	57.5
Predisposing risk factors that leads to Endo-perio lesion (There is overlapping)	Defective Restorations	454	58.7
	Vertical root fracture	450	58.2
	Dental caries	410	53.0
	Plaque and Calculus	521	67.4
	Malocclusion	206	26.6
	Excessive heat during	184	23.8

	endodontic therapy		
The most common examination method for Dx of endodontic lesion (primary type)	Percussion test.	77	10.0
	Radiograph.	114	14.7
	Vitality test.	582	75.3
Most characteristics feature of primary periodontal lesion	Bone loss and deep pocket depth.	737	95.3
	Caries.	22	2.8
	Root perforation.	14	1.8
The host defense mechanism considered as a factor affecting the extend of periodontal destruction	Yes	692	89.5
	No	81	10.5
Bacterial products and toxins may gain access to the pulp by way of exposed dentinal tubules	Yes	671	86.8
	No	102	13.2

According to table 3; knowledge of Simon classification of endo-perio lesions was linked to the participant's speciality in a meaningful way (P= 0.05) but not with age or gender.

Table 3 Association between sociodemographic characters of participants and specialty with knowledge of Simon classification of endo-perio lesions

		Know Simon classification of endo-perio lesions		Total (N=773)	P value
		Yes	No		
Age	Less than 20	0	2	2	0.322
		0.0%	0.6%	0.3%	
	20 - 25 years old	225	190	415	
		54.0%	53.4%	53.7%	
	26 - 30 years old	176	144	320	
		42.2%	40.4%	41.4%	
	31 – 35 years old	11	14	25	
		2.6%	3.9%	3.2%	
	36 - 40 years old	5	4	9	
		1.2%	1.1%	1.2%	
	41 - 50 years old	0	2	2	
		0.0%	0.6%	0.3%	
Gender	Male	214	206	420	0.117
		51.3%	57.9%	54.3%	
	Female	203	150	353	
		48.7%	42.1%	45.7%	
Specialty	Dental student	18	10	28	0.005
		4.3%	2.8%	3.6%	
	Dental intern	176	113	289	
		42.2%	31.7%	37.4%	
	General dentist	208	214	422	
		49.9%	60.1%	54.6%	

Restorative dentistry	10	7	17
	2.4%	2.0%	2.2%
Paediatric	0	1	1
	0.0%	0.3%	0.1%
Endodontics	0	6	6
	0.0%	1.7%	0.8%
Prosthodontics	5	5	10
	1.2%	1.4%	1.3%

4. DISCUSSION

Endo-Perio lesion management is the most prevalent challenges in today's therapeutic practise. The coexistence of pulpal illnesses and inflammatory periodontal diseases at the identical period might complicate diagnosisis and therapy planning, as well as impact the order of care to be undertaken (Raja Sunitha et al., 2008). Because there is a significant degree of understanding about the etiologic and pathophysiology of pulpitis and apical periodontitis, general dentistry practitioners should strive for the greatest result rate in endodontic therapy. Bacterial and viral infection are the primary causes of illness in the pulp and apical periodontium; however, promoting factors including root perforation, fractures, and dental anomalies all play a part in the formation and the development of these lesions (Al-Fouzan, 2014; Radwan et al., 2021).

In our study, 52% of participants identified Actinomycetemcomitans as the most common bacteria associated with endo-perio lesion, 17.8% *T. denticola*, 16.7% *S. mutans*, and 13.5% *S. Aureus*. Most characteristics feature of primary periodontal lesion were identified as bone loss and deep pocket depth by 95.3%, caries by 2.8% and root perforation 1.8%. A previous study reported that number of clinicians aware of risk factors and disease definition for endo-perio lesions was (43.11%) (Çirakoglu & Karayürek, 2020). Khandelwal et al., (2020) was reported that a lack of experience was evident amongst the participants except endodontists and periodontists. 66% dental professionals are reluctant to handle complex endo-perio lesions cases and 78% refer those cases to the specialists.

Only 31% of dental professionals especially specialists are capable to manage these cases. After proper endodontic therapy, primary endodontic lesions normally recover. The prognosis and therapy of endodontic–periodontal lesions vary depending on the aetiology, pathophysiology, and precise diagnosis of each illness. The prognosis is typically favourable, especially if the irrigation procedure was followed meticulously throughout the cleaning and shape the canal of the roots (Khandelwal et al., 2020). In our study 57.5% of participants think that prognosis of true combined lesion is questionable the majority of times, 30.9% reported poor or hopeless prognosis and only 11.5% reported good prognosis.

Periodontal treatment is all that is required for primary periodontal lesions. Etiologic treatment, which involves removing any variables that might cause or encourage epithelium down growth, is then there's periodontics surgery (Carrotte, 2004; Miao et al., 2015). In our study, primary endo secondary perio lesion was informed to be managed as 77.7% reported endodontic therapy followed by periodontal therapy, 15.7% RCT alone, and 6% periodontal therapy followed by endodontic therapy. Treatment of primary perio secondary endo lesion was reported as 43.9% reported endodontic therapy followed by periodontal therapy, 47.1% periodontal therapy followed by endodontic therapy, 5.3% periodontal therapy alone and 3.8% RCT alone.

In our study, knowledge of Simon classification of endo-perio lesions was substantially related to the participant's specialization (P= 0.05) but not with age or gender. A previous study reported that, perio specialists and endo specialists have advanced information's level than other dentists in other specialties. Considering demographic data, it was discovered that there was no association across sex and awareness level, but the marital status was a significant variance. Accordingly, the knowledge and awareness of single individuals about EPL was higher than married individuals (çirakoglu & karayürek, 2020). The main limitation of this article is the deficiency of previous literature to compare with our results.

5. CONCLUSIONS

In conclusion, the study found a moderate to low level of knowledge and awareness of endo-perio lesions among dentists in Saudi Arabia. Holding periodic seminars and courses for dentists working in public hospitals and private clinics to boost their knowledge level in the Dx and management of endo-perio lesions may result in more beneficial results with the growth of expertise in dentists who meet these lesions.

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Ethical approval

The research proposal was approved by the Regional Research and Ethics committee of Vision College of Dentistry and Nursing - Jeddah with Ethical approval number (21-7/1).

Author Contributions

Dr. Amna Yusuf Siddiqui: contribute in designing the study and manuscript review.

Dr. Raghad Radhan, Fahad Almalki, Faris Alghamdi, Aseel Alsubhi, Abdulrahman Alaamri, Khames T. Alzahrani: designed the study, developed the questionnaire and the informed consent, wrote the protocol and planed the study, carried out data entry, statistical design and analysis.

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Conflict of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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