

## Awareness of Periodontal Disease and Its Influence on Systemic Health: A Survey Among Medical Professionals in State of Rajasthan (Bikaner Subdivision)."

### Abstract:

**Background:** Since past few decades, it is established that periodontitis has powerful influence on various systemic conditions. To maintain general health among the medical professionals this bidirectional link between periodontal and systemic health should be acquainted.

**Aims:** To evaluate knowledge, awareness and orientation of medical professionals towards periodontal diseases and its influence on systemic health in state of Rajasthan (Bikaner sub division). To aware medical professionals for overall improved health care delivery system and motivate referrals to periodontists in systemically ill patients.

**Method and Material:** Prepared questionnaire data was gathered from 503 medical professionals of various medical institutions in state of Rajasthan (Bikaner sub division). Study spanned from June 2019 to August 2019. Data was tabulated in Microsoft Excel sheet and subjected to statistical analysis. Mean and standard deviations of measurements per group were calculated, and differences between two groups were determined using chi square test.

**Results:** Majority of participants had basic knowledge regarding periodontal diseases but clinical orientation and practice behavior were very limited. Most of them were aware regarding systemic effects of periodontal diseases like chronic heart diseases, diabetes but were unaware of likely effects of periodontal diseases on conditions such as adverse pregnancy outcomes (PTLBW, PROM, and Preeclampsia) and hospital acquired pneumonia.

**Conclusion:** Medical practitioners had insufficient knowledge and limited clinical orientation about periodontal diseases and its potential influence on systemic conditions. This emphasizes need for periodontal education in medical field.

**Keywords-**Periodontal disease, medical professionals, periodontal disease, survey, systemic health, awareness.

### Introduction:

Periodontal diseases is a chronic inflammatory condition caused by organized community of microorganisms called dental plaque, affecting the gums and the alveolar bone leading to tooth loss.[1,2] Deep periodontal pockets can harbor 107to 109 bacterial cells[3] and are documented as continually renewing reservoirs for the systemic spread of bacterial antigens, gram-negative bacteria, and pro-inflammatory mediators.[4,5]

Significant changes in understanding of complexity and pathogenesis of periodontitis suggested it to significantly enhance the risk for certain systemic diseases or alter the natural course of systemic conditions.[6] International Diabetes Federation has also proven the didactic relationship

between diabetes and periodontitis suggesting the increased susceptibility of periodontitis with uncontrolled diabetes and vice versa.[7]

Patients with severe periodontitis are almost twice as likely to have fatal heart attack and three times as likely to have stroke

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as patients without periodontal disease, even after adjusting for known cardiovascular risk factors such as blood lipids, cholesterol, body mass, diabetes and smoking. [8] Furthermore, studies suggest that periodontitis is a probable risk factor in adverse pregnancy outcomes such as pre-term rupture of membrane (PROM), pre-term low birth weight (PTLB / PTLBW), pre-eclampsia and respiratory conditions. [9]

The high prevalence of periodontal disease in India [10] and its deleterious association with systemic diseases draws immediate attention to whether the medical practitioners are aware and implement this information in their clinical practices.

To the best of our knowledge no such study has been conducted in state of Rajasthan. Thus, the present questionnaire study is designed to evaluate the knowledge, awareness and orientation of medical professionals about periodontal diseases and its influence on systemic health in state of Rajasthan (Bikaner subdivision). To encourage the medical professional's capacity towards an overall improved healthcare delivery system through the interdisciplinary approach of medical professionals and periodontist.

### **Material and method:**

This questionnaire survey was carried out among 503 medical professionals including MBBS interns/ completed MBBS/ MBBS with post-graduation of different government and private medical institutions of Rajasthan including Bikaner, Sriganganagar, Hanumangarh, from June 2019 to Aug 2019.

#### Method of collection of data

The questionnaire to assess knowledge, awareness and orientation of medical professionals towards periodontal disease was taken as proposed by the study of Kaur S et al (2015)[11] and was validated using Cronbach's alpha.

General demographics like doctor's age, sex, educational qualification, name of specialty, name of institute from where pursuing or completed their graduation was recorded in the first section of the questionnaire.

Knowledge based questions (K1-K6) regarding the gum / periodontal disease were answered in the next section of six true/false questions. Third section with four questions (C1-C4) assessed the orientation towards diagnosis of gum / periodontal disease. Then the acquaintance and attitude of participants toward gum/ periodontal diseases was inquired by giving yes/no choices (P1-P5). Last part (A1-A6) assessed awareness of participants about bidirectional relationship between periodontal disease and systemic health with options of aware/unaware.

After collecting the questionnaire, an interactive session was carried out among interested participants.

### **Statistical Analysis:**

SPSS software version 22.00 IBM inc. Chicago, USA used for descriptive statistics and chi square test carried out to detect association among categorical variables.

### **Results:**

The questionnaire was distributed among 566 medical professionals; 63 filled the forms incompletely, so were excluded giving a correct response rate of 88.87% (N=503). Majority of participants (50.5%) who enthusiastically participated were young professionals (age < 25 years). Of the total participants 44.7% (N=225) were medical interns, 9.7% (N=49) were medical graduates and 45.6% (N=229) were post-graduates.

Assessment of knowledge about periodontal/gum diseases Most of participants (K1: 89.7%) and (K2: 83.7%) agreed that majority of Indian population suffers from periodontal diseases and had knowledge that bleeding gums, exposed roots and loose teeth are signs and symptoms of periodontal diseases. 80.7% participants had knowledge of systemic conditions affecting initiation and progression of gum diseases, answered the question K3 correctly. Regarding reverse relationship i.e. periodontal medicine 79.9% correctly answered K4 and more knowledge was observed within graduates (89.8%) and result was found to be statistically significant. Question K5 revealed that almost half of participants had knowledge regarding association of poor dental health and myocardial infarction where 45.3%, 55.1% and 65.5% were interns, graduates and postgraduates and results were statistically significant.

82.7% participants knew the association of hematological disorders with periodontium where higher score was of postgraduates (88.2%) and result was found to be statistically significant. (Table 1)

Questions for knowledge assessment	Qualification			Chi square value	p value
	Intern N (%)	Graduate N (%)	Postgraduate N (%)		
K1: Majority of Indian population suffers from periodontal/gum disease?					
True	186(82.7)	10(5.0)	217(94.8)	21.01	0.001*
False	39(17.3)	19(1)	12(5.2)		
K2: Bleeding gums, exposed roots, loose teeth are signs and symptoms of gum/periodontal disease?					
True	151(67.3)	47(25.9)	223(97.4)	32.15	0.000*
False	71(32.5)	21(11)	3(2.6)		
K3: Certain systemic conditions clearly may affect the initiation and progression of gum disease/ gingivitis and periodontitis?					
True	129(57.4)	43(23.2)	211(93.1)	41.79	0.000*
False	71(32.4)	6(3.2)	16(7.2)		
K4: Gum/periodontal disease extends to other body parts/ affects any organ system?					
True	56(25.3)	5(10.2)	90(39.3)	21.03	0.001*
False	159(70.7)	41(89.8)	139(60.7)		
K5: There is an association between periodontal health and myocardial infarction?					
True	102(45.3)	7(10.1)	150(65.1)	76.09	0.000*
False	123(54.7)	23(44.9)	79(34.5)		
K6: Hematological disorders like reproduction and function of leukocytes does not have any effect on the periodontium?					
True	11(4.9)	4(19.4)	7(11.8)	9.47	0.1488*
False	146(64.6)	40(80.6)	82(36.2)		

Table 1: Association of knowledge with educational qualification of medical professionals regarding periodontal diseases

When analyzing responses to the questions exploring the practitioners regarding their clinical orientation and practice behavior towards periodontal diseases only 3% (N=15) always take history of periodontal disease and 3.6% always examined their patients with a reduced rate of occasional referrals (37.2%). Majority of participants (N=333) occasionally or never noticed the periodontal destruction in uncontrolled diabetic patients. Postgraduates seem to mostly referral/ suggestion from Periodontist / Dentist in systemically ill patients. (Table 2)

Table 2: Association of clinical practice orientation and behavior with educational qualification of medical professionals towards periodontal diseases

Questions assessing clinical orientation and behavior	Qualification			Chi square value	p value
	Intern N (%)	Graduate N (%)	Postgraduate N (%)		
C1: Do you inquire your patients if they have any gum/ periodontal disease now or in the past?					
Never	73(32.4)	5(10.2)	16(7)	66.28	0.001*
Occasionally	116(51.6)	22(44.9)	126(55)		
Very frequently	32(14.2)	20(40.8)	78(34.1)		
Always	4(1.8)	2(4.1)	9(3.9)		
C2: Do you examine your patients for any kind of gum/ periodontal disease?					
Never	54(24)	5(10.2)	16(7)	55.30	0.001*
Occasionally	117(52)	23(47)	88(38.4)		
Very frequently	49(21.8)	18(36.7)	115(50.2)		
Always	5(2.2)	3(6.1)	10(4.4)		
C3: Do you take Dentist/Periodontist suggestion or referral in systemically ill patients?					
Never	2(0.9)	1(2)	6(2.6)	27.81	0.001*
Occasionally	104(46.2)	16(32.7)	67(29.3)		
Very frequently	98(43.6)	18(36.7)	103(45)		
Always	21(9.3)	14(28.6)	53(23.1)		
C4: Have you noticed severe gum/ periodontal destruction in uncontrolled diabetic patient?					
Never	69(30.7)	2(4.6)	37(16.2)	141.50	0.001*
Occasionally	113(50.2)	14(28.6)	98(42.8)		
Very frequently	34(15.1)	18(36.7)	87(38)		
Always	9(4)	15(30.1)	7(3)		

When asked about questions regarding inclusion of periodontal examination in medical training 54.2% think that to some extent, periodontal disease evaluation should be done by general practitioners in case of systemically ill patients, and 50.9% participants agree that medical training should include acquaintance about screening periodontal disease of which graduates showed keen interest. (Table 3)

Questions assessing periodontal examination knowledge	Qualification			Chi square value	p value
	Intern N (%)	Graduate N (%)	Post graduate N (%)		
P1: Do you think that general practitioners in case of systemically ill patients should do gum/periodontal disease's evaluation?					
Yes	84(37.3)	15(30.6)	98(42.8)	18.73	0.008*
No	7(3.1)	9(18.4)	17(7.4)		
To some extent	134(59.6)	25(51)	114(49.8)		
P2: Are you at ease while performing a simple periodontal examination (oral/gingival examination)?					
Yes	31(13.8)	9(18.4)	35(15.3)	23.66	0.001*
No	91(40.4)	18(36.7)	47(20.5)		
To some extent	103(45.8)	22(44.9)	147(64.2)		
P3: Did you acquire any knowledge about periodontal/gum disease and its relation with systemic health while you were in medical college?					
Yes	64(28.4)	26(53.1)	116(50.7)	34.58	0.001*
No	18(8)	6(12.2)	26(11.3)		
To some extent	143(63.6)	17(34.7)	87(38)		
P4: Do you think that medical training should also include some acquaintance about screening of gum/periodontal disease?					
Yes	101(44.9)	28(77.6)	127(55.5)	20.51	0.003*
No	4(1.8)	3(6.2)	19(8.3)		
To some extent	120(53.3)	18(36.7)	83(36.2)		
P5: Do the patients expect that you should discuss the role of oral health and its relation with systemic health?					
Yes	44(19.6)	13(26.6)	63(27.5)	6.21	0.183#
No	111(49.3)	25(51)	92(40.2)		
To some extent	70(31.1)	11(22.4)	74(32.3)		

Table 3: Association of periodontal examination knowledge with educational qualification among medical professionals

On evaluating, awareness towards perio systemic link most of the participants i.e. 77.7% were aware that patients with poor oral hygiene has higher risk of coronary heart disease, 84.5% were aware that diabetes increases the risk and severity of gum/periodontal diseases. However when it comes to potential effects of periodontal disease on other organ systems such premature rupture of membrane (PROM), pre term low birth weight babies (PTLBW), pre-eclampsia and hospital acquired pneumonia (HAP), the knowledge was limited.[55.3] % were unaware that periodontal diseases contribute to PTLBW more than smoking and alcohol consumption during pregnancy. 65.6% (N=330) participants were unaware that periodontal disease may act as a risk factor in hospitalized patients to cause HAP and on analysis significant difference was obtained. (Table 4)

Table 4: Association of awareness with educational qualification of participants towards periodontal systemic link

Quantities assessing awareness of peri-systemic link	Qualification			Chi-square value	p-value
	Intern N (%)	Graduate N (%)	Postgraduate N (%)		
A1: Patient with poor oral hygiene has 2 fold-increased risk of coronary heart disease? Unaware Aware	39(26.2) 106(73.8)	10(20.4) 39(79.6)	43(18.8) 186(81.2)	3.74	0.1534
A2: Diabetes increases the risk and severity of gum/periodontal disease? Unaware Aware	55(24.4) 170(75.6)	6(12.7) 43(87.3)	17(7.4) 212(92.6)	10.31	0.005*
A3: Gum/periodontal disease can result in premature rupture of membrane and preterm low birth weight babies? Unaware Aware	95(42.2) 130(57.8)	22(44.0) 27(55.1)	62(27.1) 167(72.2)	30.41	0.001*
A4: Gum/periodontal disease may contribute to more preterm low birth weight babies than smoking and alcohol consumption during pregnancy? Unaware Aware	153(68) 72(32)	25(51) 24(49)	100(43.7) 129(56.3)	27.10	0.001*
A5: Gum/periodontal disease increases risk to eclampsia to 2-2.5 folds? Unaware Aware	186(82.7) 39(17.3)	35(71.4) 14(28.6)	151(65.2) 78(34.1)	12.94	0.001*
A6: Gum/periodontal disease may act as a factor in hospitalized patients to cause hospital-acquired pneumonia? Unaware Aware	181(80.4) 44(19.6)	30(61.2) 19(38.8)	119(52) 110(48)	16.46	0.001*

**Discussion:**

Although oral health is considered an important component of general health and quality of life round the globe, very few studies have focused on bidirectional relation of periodontal disease and systemic health among medical professionals. To the best of our knowledge, this is the first study of its type, in this region of the country.

In support of evidence-based care, medical professionals should become familiar about the link between systemic health and periodontal diseases in their practice as they can alter the course of systemic diseases as well as appropriately determine their treatment and prognosis. [12]

Most of the participants particularly graduates were aware about periodontal disease and its signs and symptoms. Large numbers of participants (80%) were aware about role of systemic diseases in the progression of periodontal diseases and had knowledge of the bidirectional link wherein postgraduates had higher knowledge. Participants were more aware about the association of periodontal diseases and hematological disorders (82.7%) than its relation with myocardial infarction (55.5%), which was in consistence with the report of Kaur Set al (2015). [11] Clinical orientation and

practice behavior questions were responded relatively positive by postgraduates as was observed in studies by Kaur Set al (2015), [11] Lin H et al (2014), [12]Kashefimehr A et al (2014), [13] and Al Habashneh R et al (2010). [14]

Even though higher percentage of medical practitioners accepted general practitioners in systemically ill patients should perform that periodontal examination but very few were at complete ease to perform the same with almost half of them acquired some knowledge in their college. The reason for the same could be because the interns were preparing for their post graduate entrance examination in which these questions were repeatedly asked/ or due to the strictness in few medical colleges regarding their dental posting and interest of dental teachers to teach them the same or increased awareness of medical professionals especially the college faculty who might have taught them in brief about the same.

Similar to study by Kaur S et al (2015) [11] majority of medical practitioners particularly graduates accepted that medical training should include some acquaintance about screening of periodontal disease.

Most of the medical practitioners including interns were aware of certain aspects of periodontal medicine such as poor periodontal health and diabetes, coronary heart disease in contrast to other adverse pregnancy outcomes (PROM, PTLBW, and Pre-eclampsia) and hospital acquired pneumonia.

Good basic knowledge but very limited clinical orientation and practice behavior regarding periodontal diseases implies an urgent need to enable the medical professionals to identify their patients with periodontal disease and seek periodontal opinion / referrals. It is also recommended that more space be allocated to subjects related to oral health particularly “Periodontology” in the medical curriculum. Various interdisciplinary seminars, lectures, continuing medical / dental education (CME / CDE) programs, interactive workshops and conferences with special emphasis on “Perio-Systemic Link” should be conducted on regular basis. The present study has certain limitations. The sample size of Graduates was very less which doesn't enable the broad generalization among all the groups of participants. The current data needs to be confirmed by larger prospective studies due to the small sample size in the present study. Though the self-reported questionnaire were anonymous the

responses might be biased to what the participants believed was ideal. The study was confined within small demographic area so it calls for studies to be conducted within larger demographic area.

### Conclusion:

Periodontal health has a direct and or indirect impact on the overall general health. Limited knowledge and clinical orientation of medical professionals in the present study draws immediate attention to improve the healthcare provisions in India. It also emphasizes the need for more meaningful interactions between medical and dental training. Provision of periodontal education must be enlisted and strictly implemented in the medical curriculum. The situation also calls for deployment of consultant periodontists in the general hospitals outpatient departments on a regular basis to raise the bar of healthcare services, in the best benefits of patients.

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