



## “ANTIHYPERTENSIVE DRUGS AND PERIODONTAL HEALTH: EXPLORING THE INTERPROFESSIONAL LINK

### Periodontology

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### ABSTRACT

**INTRODUCTION:** Use of Antihypertensives has led to increase in gingival enlargement(GE) a well documented side effect. Increased awareness among physicians will enable them in early detection and precise diagnosis and treatment which will improve oral health status of the population.

**AIM:** To determine knowledge and awareness of antihypertensive drugs causing GE in postgraduates and medical practitioners.

**MATERIAL AND METHODS:** Questionnaire which records demographic details, basic knowledge of periodontology, etiology and drugs causing GE, preventive and treatment aspect in 200 postgraduates and medical practitioners and their familiarity with role of dentist/periodontists in GE was distributed and analyzed.

**RESULTS:** Knowledge about basics of periodontology, etiology of gingival enlargement, drugs, preventive and treatment aspect of GE were more in medical practitioners compared to postgraduates.

**CONCLUSION:** Interprofessional collaboration between medical professional and dentist /periodontist helps in spreading awareness in diagnosis and management of drug induced gingival enlargement with proper medical and drug history.

### KEYWORDS

Gingival Enlargement, Awareness, Hypertension, Antihypertensive Drugs.

#### INTRODUCTION:

Oral health plays an integral part in maintaining systemic health of an individual. [1] Poor oral health reverberates the social inequalities, consequently the prevention of oral diseases should be a priority in developed and underdeveloped countries around the world. Medical practitioners must play an active role in oral health promotion. Appropriate knowledge of oral diseases is essential in medical practice as periodontal disease is associated with multiple systemic conditions and a large number of systemic diseases have oral manifestations, and many drugs are associated with oral adverse drug reactions. [2]

Periodontology is one of the fast growing dental specialties. Periodontology not only wrap preventive and curative aspects of oral health, but also offer cosmetic flare and regenerative speciality programs. The periodontal diseases are a group of chronic inflammatory diseases characterized by inflammation of tooth-supporting tissues like gingival, cementum, periodontal ligament and alveolar bone fostered by bacterial infection. [3] If left untreated, can deterioration of the supportive tissue of the teeth and eventually to tooth loss [4,5] and also contribute to more destructive diseases that can seriously affect the quality of life and actually shorten life expectancy. Periodontal diseases have systemic ramifications and has been implicated in a wide range of conditions such as hypertension, stroke, atherosclerosis, poor pregnancy outcome. [6]

Systemic arterial hypertension is chronic global condition leading to millions of premature deaths. Approximately around 54% of stroke and 47% of ischemic heart disease cases are linked to hypertension worldwide. Furthermore 80% of the deaths attributable to hypertension occur in low and middle income countries. [7] Hypertension has been hypothesized to be due to oxidative stress and endothelial dysfunction. It is well known that hypertension and periodontitis share common risk factors like smoking, stress, increased age, and socioeconomic factors that further confound the association between hypertension and periodontitis. Use of antihypertensive drugs bring about the control of hypertension along with the change in sedentary lifestyle habits by culminating yoga and stress relieving exercises in the daily routine. In a large cross-sectional study,

Holmlund et al.[8] reported that increased risk associated with the history of antihypertensive treatment had positive correlation with the number of periodontal pockets. Further there is a linear trend between periodontal disease severity and antihypertension treatment.

Drug-induced gingival enlargement or hyperplasia occurs as a result of systemic drug use. It occurs as an unwanted side effect following the administration of drugs like antihypertensives, immunosuppressants, calcium channel blockers and the overgrowth cannot be explained as a variation of the intended pharmacological action of the drug. [9] Several risk factors namely age, genetic predisposition, presence of preexisting plaque, and gingival inflammation influence the relationship between the drugs and gingival hyperplasia. [10] It would be pertinent to identify and explore possible risk factors relating to both prevalence and severity of drug-induced gingival overgrowth. This would be possible with the collaboration of physician and dental professional to maintain the well being of an individual.

Interprofessional collaboration is an “affiliation between a group of health providers and a client through participatory collaborative and coordinated approach to shared decision making in social and other health related issues”. [11] It is a process in which different professional groups work in harmony to improve health care. Greater resource efficiency, improvement in the standards of health care services, comprehensiveness, and continuity of care by reducing duplication and gaps in services is achieved. [12] This improved professional cooperation between medical and dental practitioners may benefit all parties and help in public health promotion. A proficient collaboration between medical and dental practice not only fosters people’s health through synergistic communication and decision-making, but provides cost-effective, multidisciplinary care for patients. [13] Studies addressing the awareness level about periodontics among other healthcare providers like medical professionals are very few. [14,15]

The purpose of this study is to investigate the knowledge and awareness of antihypertensive drugs causing gingival enlargement in postgraduates and medical practitioners.

**MATERIALS AND METHODS:**

After obtaining ethical clearance from ethical committee of P.M. Nadagowda Memorial Dental college and hospital, Bagalkot, An anonymous closed end questionnaire survey was conducted in medical college and private clinics of Bagalkot, Karnataka, India to assess the awareness of postgraduates and medical professionals from different specialities of medicine on oral health care.

A total of 200 participants had responded to a self-administered questionnaire which comprised of 21 close ended questions. A duly signed informed consent was obtained from all the professionals participating in the study and their confidentiality was maintained. The subjects were asked to mark their responses using liekart scale. Respondents of either gender with age between 24-60 years of various medical departments were included in the study. After explaining the purpose of the study to them, the questionnaires were handed over to them, who rated it themselves.

Subjects have been divided into 2 groups. One group containing postgraduates and the other group containing medical practitioners. First 1-4 questions determine the demographic details of the professional participating in the study, 5-9 questions determine the basic knowledge of periodontology, 10th question determine etiology of gingival enlargement 11<sup>th</sup>, 12<sup>th</sup> questions determine the drugs causing gingival enlargement, 13-15 determine the preventive aspect of gingival enlargement and 16-21 questions determines the treatment aspect of gingival enlargement.

Their responses were then ranked and evaluated according to the number of correct responses which were chosen. The responses were also classified according to whether they came from a doctor with a basic qualification in medicine (MBBS) or with an advanced qualification in medicine (MD, MS or a superspecialization). Another classification was made according to the clinical experience based on their rank as medical professional. Another classification was made according to gender if the professional is a male or a female. Data were then collected, compiled and results were tabulated and statistically analysed. Fisher exact test was applied for calculating p values.

**RESULTS:**

A total of 200 Medical practitioners and postgraduates completed the questionnaire study, of which 88 participants were the medical practitioners and 112 participants were medical postgraduates, of which 109 were males and 91 were females.

Many of the postgraduates fall under the age group of 24-30 (Table I). Rank as medical professional (Table II) depicts the years of experience the individual has in the field of medicine and their clinical expertise.

**Table I- Depicting the age group of the professional**

Age (in years)	Total
24-30	95
31-39	50
40-49	28
50-59	14
>59	13

**Table II- Depicting the Rank of the Medical Professional**

Rank as Medical professional	Total
Assistant professor	41
Professor	29
Reader	18
Post graduate	112

A total of 60-PG and 47-MP respondents were aware of the condition called periodontitis. 88.6%-MP and 72.3%-PG knew the clinical manifestations of periodontitis which included bleeding gums, mobile teeth and gingival recession. 89.8% -MP and 79.5%-PG were aware that there is a speciality for treating gums or periodontal diseases whereas 14.5% of the total respondents don't know about the speciality. 61.4%-MP and 48.2%-PG, feel that there is link between chronic periodontitis and hypertension whereas 21.6%-MP, 40.2%-PG were not aware about the link. 71.6%-MP and 69.6%-PG don't ask for the dental history before prescribing drugs. (Table III)

**Table III:- Comparison of the knowledge and awareness of gingival enlargement among medical practitioners and postgraduates**

		Study Groups		Total	Fishers exact test p-value
		MP	PG		
Q5	1	8	2	10	0.10(NS)
		9.1%	1.8%	5.0%	
	2	3	3	6	
		3.4%	2.7%	3.0%	
	3	30	47	77	
		34.1%	42.0%	38.5%	
4	47	60	107		
	53.4%	53.6%	53.5%		
Q6	1	7	29	36	<0.001*
		8.0%	25.9%	18.0%	
	2	0	2	2	
		0.0%	1.8%	1.0%	
	3	3	0	3	
		3.4%	0.0%	1.5%	
4	78	81	159		
	88.6%	72.3%	79.5%		
Q7	1	79	89	168	0.11(NS)
		89.8%	79.5%	84.0%	
	2	1	2	3	
		1.1%	1.8%	1.5%	
	3	8	21	29	
		9.1%	18.8%	14.5%	
Q8	2	54	54	108	0.02*
		61.4%	48.2%	54.0%	
	3	15	13	28	
		17.0%	11.6%	14.0%	
5	19	45	64		
	21.6%	40.2%	32.0%		
Q9	1	25	34	59	0.88(NS)
		28.4%	30.4%	29.5%	
	2	63	78	141	
71.6%		69.6%	70.5%		
Q10	1	4	3	7	0.01*
		4.5%	2.7%	3.5%	
	2	7	5	12	
		8.0%	4.5%	6.0%	
	3	10	33	43	
		11.4%	29.5%	21.5%	
4	67	71	138		
	76.1%	63.4%	69.0%		
Q11	1	61	52	113	0.005*
		69.3%	46.4%	56.5%	
	2	9	21	30	
		10.2%	18.8%	15.0%	
	3	18	39	57	
		20.5%	34.8%	28.5%	
Q12	1	21	21	42	0.07(NS)
		23.9%	18.8%	21.0%	
	2	10	26	36	
		11.4%	23.2%	18.0%	
	3	8	16	24	
		9.1%	14.3%	12.0%	
4	49	49	98		
	55.7%	43.8%	49.0%		
Q13	1	73	85	158	0.29(NS)
		83.0%	75.9%	79.0%	
	2	15	27	42	
17.0%		24.1%	21.0%		
Q14	1	88	112	200	-
		100.0%	100.0%	100.0%	
Q15	1	19	42	61	<0.001*
		21.6%	37.5%	30.5%	
	2	29	50	79	
		33.0%	44.6%	39.5%	
	3	28	11	39	
		31.8%	9.8%	19.5%	
	4	12	9	21	
		13.6%	8.0%	10.5%	

Q16	2	40	29	69	<0.001*
		45.5%	25.9%	34.5%	
	3	44	60	104	
		50.0%	53.6%	52.0%	
4	4	23	27		
	4.5%	20.5%	13.5%		
Q17	1	55	55	110	0.02*
		62.5%	49.1%	55.0%	
	2	5	7	12	
		5.7%	6.3%	6.0%	
	3	4	21	25	
		4.5%	18.8%	12.5%	
4	24	29	53		
	27.3%	25.9%	26.5%		
Q18	1	7	12	19	0.72(NS)
		8.0%	10.7%	9.5%	
	2	52	70	122	
		59.1%	62.5%	61.0%	
	3	25	27	52	
		28.4%	24.1%	26.0%	
	4	4	3	7	
		4.5%	2.7%	3.5%	
Q19	1	5	12	17	0.002*
		5.7%	10.7%	8.5%	
	2	65	55	120	
		73.9%	49.1%	60.0%	
	3	7	26	33	
		8.0%	23.2%	16.5%	
5	11	19	30		
	12.5%	17.0%	15.0%		
Q20	1	3	1	4	0.64(NS)
		3.4%	0.9%	2.0%	
	2	48	60	108	
		54.5%	53.6%	54.0%	
	3	19	24	43	
		21.6%	21.4%	21.5%	
	5	18	27	45	
		20.5%	24.1%	22.5%	
Q21	1	21	35	56	0.35(NS)
		23.9%	31.3%	28.0%	
	2	48	54	102	
		54.5%	48.2%	51.0%	
	3	2	1	3	
		2.3%	0.9%	1.5%	
	4	2	0	2	
		2.3%	0.0%	1.0%	
	5	15	22	37	
		17.0%	19.6%	18.5%	

\*p<0.05 statistically significant, p>0.05 Non Significant, NS

76.1%-MP and 63.4%-PG respondents know that gingival enlargement could be caused by inflammation, puberty, pregnancy and some drugs. 11.4%-MP and 29.5%-PG respondents feel it could be only inflammatory whereas 8%-MP and 4.5%-PG, feel it is only drug induced and 4.5%-MP and 2.7%-PG respondents feel it could be puberty or pregnancy induced. (Table III)

69.3%-MP and 46.4%-PG were aware that antihypertensive drugs cause gingival enlargement whereas 20.5%-MP and 34.8%-PG were not aware about it. 55.7%-MP and 43.8%-PG know that the calcium channel blockers, immunosuppressive drugs, and anticonvulsants were the drugs that cause gingival enlargement. (Table III)

83%-MP and 75.9%-PG think that there is dentist/Periodontist role in the treatment of drug induced gingival enlargement. All of them consult a dentist when they personally have inflammation of gums, ulcers/Pus discharge in their mouth. (Table III)

45.5%-MP, 25.9%-PG respondents often change drugs in drug induced gingival enlargement whereas 50%-MP, 53.6%-PG respondents occasionally change drugs and 4.5%-MP, 20.5%-PG respondents never change drugs. 62.5%-MP and 49.1%-PG respondents encourage the patient to consult the dental professionals who have/are at the risk of periodontal disease. 67.1%-MP, 73.2%-PG respondents agree that

discussing /evaluating the periodontal status is peripheral to their role as a physician whereas 32.9%-MP, 26.8%-PG respondents disagree it. 57.9%-MP, 54.5%-PG respondents think that scaling would regress the condition of drug induced gingival enlargement whereas 20.5%-MP, 24.1%-PG respondents don't know about it. 54.5%-MP, 48.2%-PG respondents think that surgical excision is used occasionally for the treatment of drug induced gingival enlargement whereas 2.3%-MP, 0.9%-PG respondents feel that it is used frequently and 1% of the total respondents feel that it is always used for the treatment. 23.9%-MP, 31.3%-PG think that surgical excision is never used for the treatment of drug induced gingival enlargement whereas 17%-MP, 19.6%-PG respondents don't know about it. (Table III)

### DISCUSSION:

William Osler stated that mouth is the mirror of the general health. Periodontal disease is an intricate infectious disease ensuing from the interplay of host bacterial infections and its response. Focal infection theory explains that often asymptomatic and a localized infection, can disseminate microorganisms or their toxins to distant sites within an individual and there by initiate the disease process. [16] Systemic disorders result by vascular dissemination of bacterial products, such as lipopolysaccharides through sulcular epithelium. Poor oral health maintenance reflects on the general health of the individual. This cross-sectional study was conducted to evaluate the knowledge, attitude and awareness of medical practitioners and postgraduates on the adverse drug reactions caused by antihypertensive drugs such as gingival enlargement.

Hypertension is a bane on current generations life owing to stress. The association between hypertension and periodontium has been emphasized by a US national survey which demonstrated that gingival bleeding was consistently associated with Systolic Blood Pressure and High Blood Pressure. Gingival bleeding is an indicator of active inflammation in the oral cavity, whereas the other periodontal disease parameters like loss of attachment or pocket depth are indicative of lifetime experience of periodontal disease.[17]

Physicians are endowed to have a basic dental knowledge as they do come across various oral tribulations among patients such as tooth ache, gingival enlargement, bleeding gums, various white and red lesions in their clinical practice. If these dental issues are identified, examined and addressed at the initial stages, the oral health of the individual would be improved thereby improving the quality of life of the population. Dental infections are insidious diseases and, if left untreated, will continue to destroy both gum tissue and the underlying bone. [2]

Medical practitioners treat and recall hypertensive individuals on a frequent basis. A knowledge about the side effects of various anti-hypertensive medications prescribed will go a long way improving the overall systemic and oral health of the individual. With this in mind the present study was conducted. The findings of this study showed different median levels for the postgraduates and medical practitioner's knowledge about basics of periodontology, etiology, drugs causing gingival enlargement, preventive and the treatment aspect of gingival enlargement which indicated a significant difference between them.

This study indicated that gender did not have any effect on the knowledge of antihypertensive drugs causing gingival enlargement. These results were in agreement with those of the study by Poorasemi et al (2004) [18] in which they reported no correlation between gender and knowledge of periodontal diseases.

The results also revealed a significant relationship between the postgraduates and medical practitioner's age and knowledge of periodontal disease. These findings were in accordance with the results of Rafei et al (2006). [19] Older age may represent more experience. Naturally, the older physicians have acquired more experience over time about the oral health and its correlation with systemic diseases.

A significant correlation was found among the postgraduates and medical practitioners when comparing their qualification and rank in the professional setting with the knowledge of antihypertensive drugs causing gingival enlargement. This was in agreement with the findings of Chitsazi et al (2004) [20] for general practitioners. The basic knowledge of periodontology was reported to be higher in medical practitioners than that of postgraduates which was in agreement with the studies carried out by Nagarkanti et al (2013) [21] and Nojumi et al (2001) [22], in which they showed a correlation between higher

educational levels and knowledge of periodontal diseases. Higher qualification and higher rank of appointment meant more clinical expertise and knowledge.

The awareness of antihypertensive drugs causing gingival enlargement was higher in medical practitioners than in postgraduates. Similar results were obtained in a study conducted by Anandakumar et al in 2016. [23]

Studies found that preventive health behaviours such as attending regular dental check-ups is allied with good attitude towards learning. [24,25] Good attitude to collaboration between medical and dental practice could be associated with good attitude towards learning.

Many of the respondents feel that discussing or evaluating the periodontal status is peripheral to their role as physician, the results of which is contradictory to the studies done by Roshni jaiswal et al in 2015. [26]

Many of the medical practitioners feel that change of drugs would regress the condition when compared to the postgraduates, the results of which is contradictory to the studies done by swati pralhad et al in 2011. [27] Many medical practitioners feel that scaling would regress the condition compared to the postgraduates, the results of which is contradictory to the studies done by swati pralhad et al in 2011. [27] However, few medical practitioners feel that surgical excision is used for the treatment of drug induced gingival enlargement which is in accordance with the studies conducted by swati pralhad et al in 2011. [27]

#### FUTURISTIC STRATEGIES:

Owing to a lack of awareness about knowledge and awareness of antihypertensive drugs causing gingival enlargement few steps need to be taken in this area. Interprofessional collaboration can be achieved by implementing the following strategies to improve the current situation of awareness levels.

- MBBS curriculum in India includes a dental posting in which they have an exposure to dental health aspects which improves their awareness, knowledge and attitude towards dentistry. Similar curriculum should be implemented in dental speciality to be aware of various systemic conditions.
- Combine continuing medical education (CME) and continuing dental education (CDE) programs.
- Publish our articles in medical specialty journals and vice-versa.
- Conduct combined conferences at national and international levels.
- Circulate combined newsletters and
- Conduct similar surveys and awareness programs at the national level.
- Setting up of associate clinics which includes Dental and medical practitioners should be encouraged so that the patients are at benefit.
- Doctors should be advised to examine the oral cavity of the patients as oral cavity is the mirror of general health.

#### CONCLUSION:

Regardless of the tremendous advancements in the field of Dentistry, most of the medical practitioners had a relatively low level of knowledge about the oral/periodontal health related conditions and about the related specializations in the field of dentistry. Most of them could not recognize the common periodontal diseases and advise their patients to consult a periodontist which may be attributed to the lack of time and insufficient training. The results of this survey suggest that medical practitioners and postgraduates are not as knowledgeable as they should be about various periodontal conditions, their detection and prevention.

It is time to reiterate and spread the awareness among the medical professionals about the key and pivotal role played by the periodontist in diagnosis and management of drug induced gingival enlargement with proper medical and drug history. Most of the medical practitioners are those who have an opportunity to encourage oral health because of their access to families as a family physician which helps in spreading the awareness of such drug induced conditions among the public. It is also mandatory that medical practitioners should keep their knowledge refurbished with time and get actively involved in oral health maintenance, as this will help in early detection, prevention and treatment of periodontal diseases and also enhances systemic health.

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