

Research Article

Prevalence of Aggressive Periodontitis in Moradabad Population with Their Systemic Manifestations: A Cross Sectional Survey

Dr. Keerti Sharma*, Dr. Rohit Rai

Department of Periodontology, Teerthanker Mahaveer Dental College & Research Centre, Moradabad, India

***Corresponding author**

Dr. Keerti Sharma

Email: dr.keertisharma@gmail.com

Abstract: To determine the prevalence of aggressive periodontitis and associated systemic manifestations in Moradabad district, Uttar Pradesh, India. 3000 patients, including 1872 males and 1128 females were evaluated with mean age of 30.99. The study population was classified into three groups: gingivitis, chronic periodontitis and aggressive periodontitis. Subjects with aggressive periodontitis were further classified into localized (LAP) and generalized (GAP) groups. Based on the Hospital anxiety and depression scale study subjects were classified into non case, borderline case and case. Forty four patients were diagnosed with aggressive periodontitis of which 25 were LAP and 19 were gap. Prevalence rates of fatigue was 20% (LAP) and 15.78% (GAP); weight loss was; 4% (LAP) and 10.52% (GAP); loss of appetite was 8% (LAP) and 15.78% (GAP). The distribution of anxiety scores in LAP group was 44 % (Noncase), 28% (Borderline) and 28% (Case). The distribution of anxiety scores in GAP was 31.5% (Noncase) 31.5% (Borderline) 37% (Case). The distribution of depression scores in LAP group was 68% (Noncase) 20% (Borderline) 12% (Case). The distribution of depression scores in GAP was; 57.89% (Noncase); 21.05% (Borderline); 21.05% (Case). The prevalence of aggressive periodontitis was 1.5% in Moradabad district. The localized form was more common than the generalized form. The frequency of systemic manifestations such as fatigue, weight loss and loss of appetite was significantly greater in aggressive periodontitis. Significant co-relation between anxiety/depression and aggressive periodontitis was observed.

Keywords: Localized aggressive periodontitis, Generalized aggressive periodontitis, Stress, Anxiety, Depression, Systemic Manifestations.

INTRODUCTION

Periodontitis is defined as "an inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms or groups of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with pocket formation, recession, or both [1]. Periodontitis is a multifactorial disease that involves infection and inflammation of supporting periodontal tissues leading to their destruction. Based on the rate of progression periodontitis can be broadly classified into chronic & aggressive forms. Aggressive periodontitis encompasses rapidly progressive forms of periodontitis and is characterized by severe destruction of periodontal ligament and alveolar bone occurring in otherwise systemically healthy individuals. It is characterized by a rapid loss of clinical attachment and alveolar bone and normally affects young adults" [2].

The terms "early-onset periodontitis" (EOP) and "juvenile periodontitis" (JP) were replaced by that of "aggressive periodontitis" (AP) according to the AAP classification of periodontal diseases and conditions in 1999 [3]. Aggressive periodontitis differs from the

chronic form by the rapid rate of disease progression seen in, an otherwise healthy individual, an absence of large accumulation of dental plaque and calculus. This form of periodontitis usually affects young people at or after puberty, and thus can be observed during the second and third decade of life. The primary features of aggressive periodontitis include a history of rapid attachment and bone loss with familial aggregation [4].

Aggressive periodontitis can be localized or generalized aggressive periodontitis. Localised aggressive periodontitis occurs in children and adolescents without clinical evidence of systematic disease and is characterised by the severe loss of alveolar bone around permanent teeth. Frequently the disease is localized to the permanent first molars and incisors [5]. Generalised aggressive periodontitis often considered being a disease of adolescents and young adults can begin at any age and often affects the entire dentition. Individuals with generalised aggressive periodontitis exhibit marked periodontal inflammation and have heavy accumulation of plaque and calculus [6, 7].

There are many risk factors that could be considered as causal factors for aggressive periodontitis. Risk factors may be modifiable or non-modifiable. Modifiable risk factors are usually environmental or behavioural in nature, whereas non-modifiable risk factors are usually intrinsic to the individual, and therefore will not easily be changed [8].

Globally, studies have been performed to determine the prevalence of periodontal diseases in diverse population groups and their association with several factors such as age, race, sex, habits, socioeconomic status, plaque retentive factors, genetic risk factors, microbiology etc. [9-13].

In India, several studies have been conducted to determine the oral health status and prevalence of gingivitis and periodontitis [14-19]. A national oral health survey done in the year 2002-03 revealed that the prevalence rates in different states of India for gingivitis ranged from 41.8% to 92.9% and for periodontitis from 0.2% to 29.1%.²⁰ however most of these studies have not differentiated between the chronic and aggressive forms of periodontitis.

Although there is data available regarding the relationship between aggressive periodontitis and sociodemographic factors, the association of aggressive periodontitis with systemic manifestations such as anxiety, depression, malaise, weight loss and loss of appetite has not been sufficiently reported. Based on this aspect, a study on a Jordanian population revealed a higher prevalence of anxiety and depression in aggressive periodontitis patients as compared to chronic periodontitis and control cases [7]. However till date, data on the prevalence rates of aggressive periodontitis and its association with systemic disorders in Indian populations is lacking.

Hence, this cross-sectional study was conducted to determine the prevalence of aggressive periodontitis and its association with systemic manifestations in Moradabad district, Uttar Pradesh, North India.

Aim and Objectives

The aim of this cross-sectional study was to determine the prevalence of aggressive periodontitis and its association with systemic manifestations in Moradabad district with the following objectives-

- To determine the prevalence of aggressive periodontitis in Moradabad district.
- To assess the prevalence of localized and generalized aggressive periodontitis.
- To determine the association of aggressive periodontitis with systemic manifestations in Moradabad district.

MATERIALS AND METHODS

Study Design

The present cross sectional study was conducted to assess the prevalence of aggressive periodontitis and association of systemic manifestations in Moradabad district. The study utilized a convenience sampling model for selecting the subjects from Moradabad district. Data was recorded for a total of 3000 dentate subjects. Both male and female were included.

Methodology

The 3000 subjects were divided into four age groups:

- I. < 20yrs,
- II. 20-30 yrs,
- III. 30- 40 yrs
- IV. >40 yrs

Statistical Analysis

All the study variables were subjected to statistical analysis using the Statistical Package for Social Sciences (SPSS Statistics Base version 19.0) software. The Pearsons Chi-square test was used to compare between percentages and the differences in post hoc test were used to analyze the differences in Socio-demographic characteristics, Gingival Index, systemic manifestations and HAD scores.

RESULTS

The present cross- sectional survey consisted of 3000 patients, including 1872 males and 1128 females. Forty four out of 3000 patients were diagnosed with aggressive periodontitis. The localized form was more common than the generalized form by a ratio of 1.32:1 (Table 2, 3, 4) (Fig. 1). The least number of patients were found in the <20 years age group and higher number of patients were found in 20-30 years age group. The average age of the study population was 30.99 (Table 5, 6, 7) (Fig. 2). The overall sex ratio was 2.65:1 (male: female). The number of males with aggressive periodontitis was significantly higher than that of females (Table 8, 9) (Fig. 3). Based on the grade, highest numbers of mild cases were observed in gingivitis group (81.60%), moderate cases in aggressive periodontitis (56.12%) and severe cases in chronic periodontitis (56.12%). The frequency of gingival index was significantly higher in AP subjects than gingivitis ($p = <0001$) (Table 10, 11, 12, 13, 14) (Fig. 4, 5). About 36 % of AP patients reported that they often experienced one or more systemic symptoms (mostly fatigue), which they could not relate to disease or to external factors. A lower percentage of CP cases (20%) and gingivitis (about 19.98%) reported the presence of such symptoms. The frequency of systemic manifestations of fatigue is significantly greater in AP subjects than gingivitis ($p = 0.72$), CP vs. gingivitis ($p=0.39$), CP vs. AP ($p=0.29$) and in loss of appetite significantly greater in CP vs. gingivitis ($p=0.95$), AP subjects than gingivitis ($p= 0.42$), CP vs. AP ($p=0.21$) and in weight loss significantly greater in AP subjects than gingivitis ($p= 0.99$), CP vs. gingivitis ($p=0.98$), CP vs. AP ($p=0.96$) (Table:15,16,17,18) (Chart:6,7,8,9,10,11) The frequency of HAD scale for

anxiety among the Study Population was significantly greater in CP vs. AP (p=0.81), CP vs. gingivitis (p=0.028), AP subjects than gingivitis (p = 0.28). The frequency of HAD scale for depression among the Study Population was significantly greater in CP vs. AP (p=0.32), CP vs. gingivitis (p=0.19), AP subjects than gingivitis (p = 0.001)

Based on the study results, the systemic manifestations of fatigue, loss of appetite and weight loss as well as anxiety and depression were strongly associated with AP.

Table 1: Hospital Anxiety and Depression Scale (Scoring Sheet) [21]

	Yes definitely	Yes sometimes	No, not much	No, not at all
1. I wake early and then sleep badly for the rest of the night.	3	2	1	0
2. I get very frightened or have panic feelings for apparently no reason at all.	3	2	1	0
3. I feel miserable and sad.	3	2	1	0
4. I feel anxious when I go out of the house on my own.	3	2	1	0
5. I have lost interest in things.	3	2	1	0
6. I get palpitations, sensations of butterflies' in my stomach or chest.	3	2	1	0
7. I have a good appetite.	0	1	2	3
8. I feel scared or frightened.	3	2	1	0
9. I feel life is not worth living.	3	2	1	0
10. I still enjoy the things I used to.	0	1	2	3
11. I am restless and can't keep still.	3	2	1	0
12. I am more irritable than usual.	3	2	1	0
13. I feel as if I have slowed down.	3	2	1	0
14. Worrying thoughts constantly go through my mind.	3	2	1	0

Anxiety 2, 4, 6, 8, 11, 12, 14, Depression 1, 3, 5, 7, 9, 10, 13, Scoring 3, 2, 1, 0 (For items 7 & 10 the scoring is reversed)
 GRADING: = 0 – 7 = Non-case 8 – 10 = Borderline case 11+ = Case

Table 2: Distribution of subjects with periodontal diseases based on age groups

Age Group	Gingivitis	Chronic Periodontitis	Aggressive Periodontitis	Total
<20 Yrs	459(27%)	30 (2%)	8(18%)	497(17%)
20-30 Yrs	756(45%)	232(18%)	30(68%)	1018(34%)
31-40 Yrs	290(17%)	402 (32%)	5(12%)	697(23%)
>40 Yrs	186(11%)	601(48%)	1(2%)	788(26%)
Total	1691(56%)	1265(42%)	44(2%)	3000

Table 3: Distribution of subjects with periodontal diseases based on age groups in LAP and GAP

Age Group	Localized Aggressive Periodontitis	Generalized Aggressive Periodontitis
<20 Yrs	7 (15.90)	1 (2.27)
20-30 Yrs	17 (38.63)	13(29.54)
31-40 Yrs	1(2.27)	4(9.09)
>40 Yrs	0 (0)	1(2.27)
Total	25(57%)	19(43%)

Table 4: Chi-Square Test (p-Value) of Age Group

CP VS Gingivitis ^a	AP VS Gingivitis ^b	CP VS AP ^c
< 0.001	<0.001	<0.001

^a CP vs. gingivitis; Chi-square test, ^b AP vs. gingivitis; Chi-square test, ^c CP vs. AP; Chi-square test

Table 5: Distribution of subjects with periodontal disease based on sex

Sex Group	Gingivitis	Chronic Periodontitis	Aggressive Periodontitis	Total
Male	1091 (61.1%)	682 (53.91%)	19(43%)	1872(62.4%)
Female	600(38.9%)	583 (46.08%)	25 (57%)	1128(37.6%)

Table 6: Distribution of subjects with periodontal disease based on sex LAP and GAP

Sex Group	Localized Aggressive Periodontitis	Generalized Aggressive Periodontitis
MALE	11(25)	8(18.18)
FEMALE	14(31.82)	11(25)

Table 7: Chi-Square Test (p-Value) of Sex

CP VS Gingivitis ^a	AP VS Gingivitis ^b	CP VS AP ^c
0.39	<0.002	<0.001

^a CP vs. gingivitis; Chi-square test, ^b AP vs. gingivitis; Chi-square test, ^c CP vs. AP; Chi-square test

Table 8: Gingival Index scores for study population

Grades	Gingivitis	Chronic Periodontitis	Aggressive Periodontitis
Normal (0)	0	0	0
Mild (1)	1380 (81.60)	10 (0.79)	6 (22.72)
Moderate (2)	311 (18.39)	545 (43.08)	24 (54.54)
Severe (3)	0	710 (56.12)	14 (31.81)

Table 9: Chi-Square Test (p-Value) of Gingival Index Score

^a CP vs. gingivitis	^b AP vs. gingivitis	^c CP vs. AP
<.0001	<.0001	<.0001

^a CP vs. gingivitis; Chi-square test, ^b AP vs. gingivitis; Chi-square test, ^c CP vs. AP; Chi-square test

Table 10: Differential distribution of systemic manifestations in study population

Systemic Manifestation	Gingivitis	Chronic Periodontitis	Aggressive Periodontitis
Fatigue	321(19%)	253 (20%)	8 (18%)
Loss of appetite	68 (4%)	38 (3.1%)	5 (11%)
Weight loss	67 (4%)	39 (3.1%)	3 (7%)

^a Percentage Out of a Total of 169, ^b Percentage Out of a Total of 1265, ^c percentage Out of a Total of 44

Table 11: Differential distribution of systemic manifestations in Localized aggressive Periodontitis and Generalized Aggressive Periodontitis

Systemic Manifestation	LAP ^a	GAP ^b
Fatigue	5(20%)	3(15.78%)
Loss of Appetite	2(8%)	3(15.78%)
Weight Loss	1(4%)	2 (10.52%)

^a Percentage out of a total of 25, ^b Percentage out of a total of 19

Table 12: Chi-Sqaure Test (p-Value) of Fatigue

^a CP vs. Gingivitis	^b AP vs. Gingivitis	^c CP vs. AP
0.39	0.72	0.29

Table 13: Chi-Square Test (*p*-Value) of Loss of Appetite

^a CP vs. Gingivitis	^b AP vs. Gingivitis	^c CP vs. AP
0.95	0.42	0.21

Table 14: Chi-Square Test (*p*-Value) of Weight Loss

^a CP vs. Gingivitis	^b AP vs. Gingivitis	^c CP vs. AP
0.98	0.99	0.96

^a CP vs. gingivitis; Chi-square test, ^b AP vs. gingivitis; Chi-square test, ^c CP vs. AP; Chi-square test

Table 15: HAD scale for anxiety and Depression among the Study Population

Variables		Gingivitis	Chronic Periodontitis	Aggressive Periodontitis
Anxiety	Non Case	1100 (65%)	632 (50%)	17 (39%)
	Borderline Case	253 (15%)	380 (30%)	13 (30%)
	Case	338 (19.98%)	253 (20%)	14 (31%)
	Mean (±SD)	6.97(±3.3)	7.60±2.4	8.82(±3.1)
Depression	Non Case	1437 (85%)	885 (70%)	28 (63%)
	Borderline Case	186 (11%)	316 (25%)	9 (21%)
	Case	68 (4%)	64 (5%)	7 (16%)
	Mean (±SD)	5.72±3.46	.35±3.2	8.20(±2.5)

Table 16: HAD Scale for Anxiety and Depression among the Study Population in Localized Aggressive Periodontitis and Generalized Aggressive Periodontitis

Variables		LAP	GAP
Anxiety	Non Case	11 (44%)	6 (31.5%)
	Borderline Case	7 (28%)	6(31.5%)
	Case	7(28%)	7(37%)
	Mean (±Sd)	8.08(±3.1)	8.84±2.4
Depression	Non Case	17 (68%)	11(57.89%)
	Borderline Case	5 (20%)	4 (21.05%)
	Case	3 (12%)	4 (21.05%)
	Mean (±Sd)	6.64(±2.5)	7.31±3.2

Table 17: Chi-Square Test (*p*-Value) of Anxiety

^a CP vs. gingivitis	^b AP vs. gingivitis	^c CP vs. AP
0.40	0.028	0.81

^a CP vs. gingivitis; Chi-square test, ^b AP vs. gingivitis; Chi-square test, ^c CP vs. AP; Chi-square test

Table 18: Chi-Square Test (*p*-Value) of Depression

^a CP vs. gingivitis	^b AP vs. gingivitis	^c CP vs. AP
0.19	0.001	0.32

^a CP vs. gingivitis; Chi-square test, ^b AP vs. gingivitis; Chi-square test, ^c CP vs. AP; Chi-square test

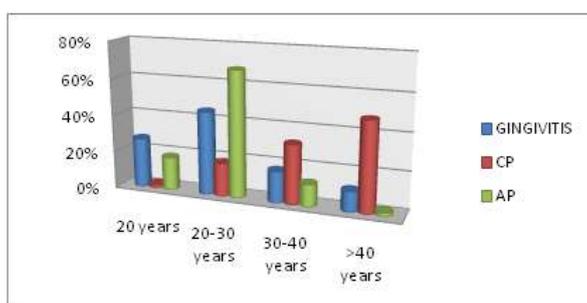


Fig. 1: Distribution of subjects with periodontal diseases based on age groups

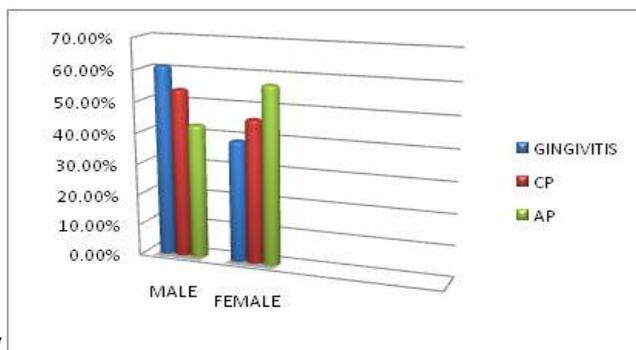


Fig. 2: Distribution of subjects based on sex

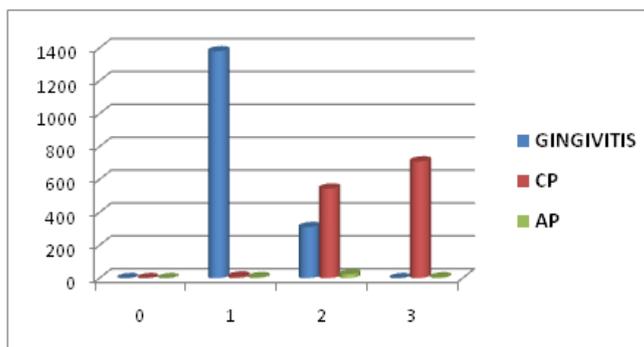


Fig. 3: Gingival Index scores for study population

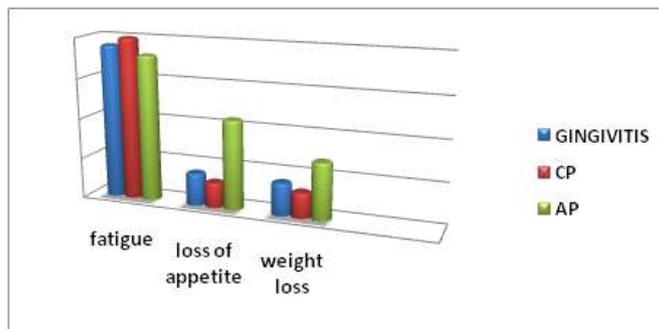


Fig. 4: Differential Distributions of Systemic Manifestations in study population

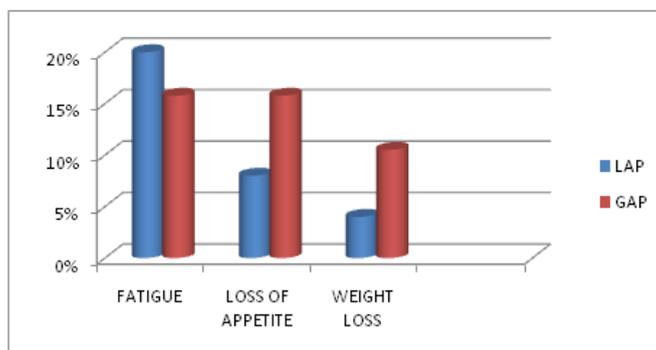


Fig. 5: Differential distributions of systemic manifestations in LAP and GAP

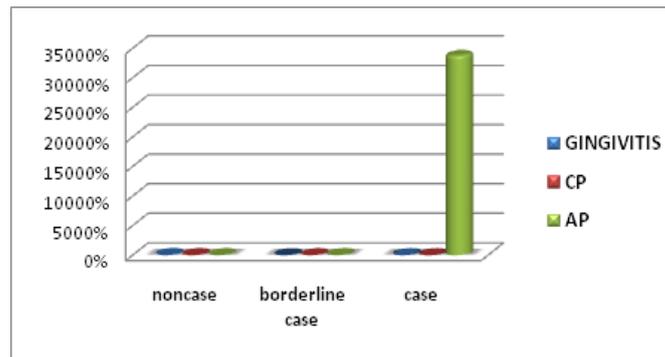


Fig. 6: HAD Scale for Anxiety among the study population

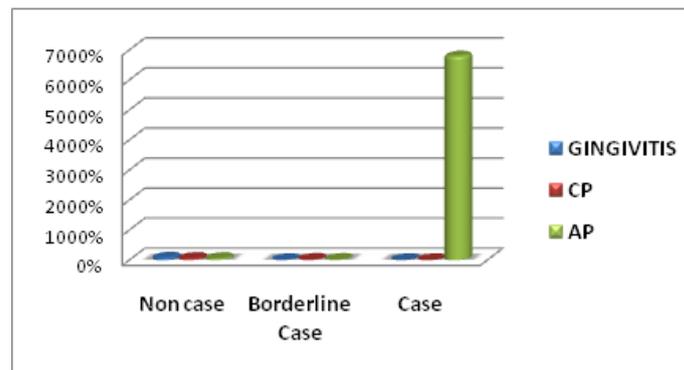


Fig. 7: HAD Scale for Depression among the study population

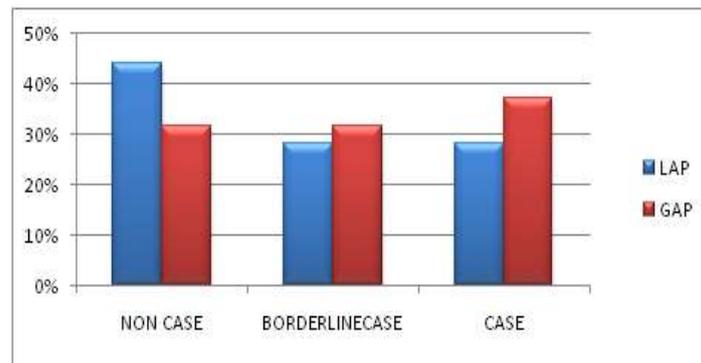


Fig. 8: HAD Scale for anxiety among aggressive periodontitis patients

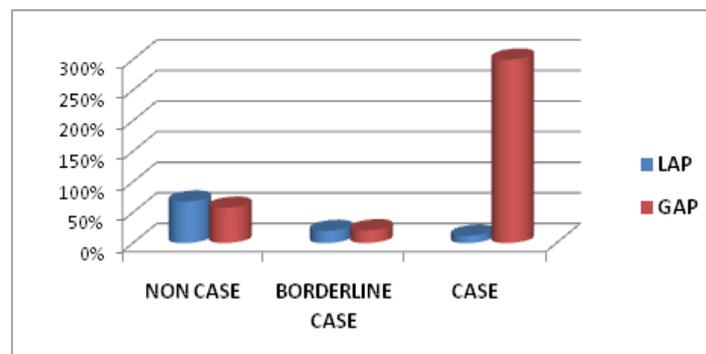


Fig. 9: HAD Scale for Depression among aggressive periodontitis patients

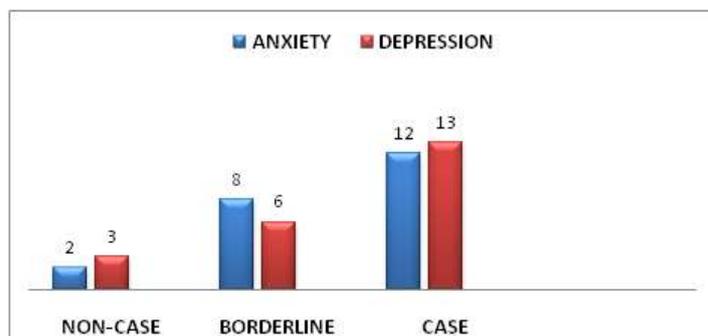


Fig. 10: Distribution of non-case, borderline, case of anxiety and depression

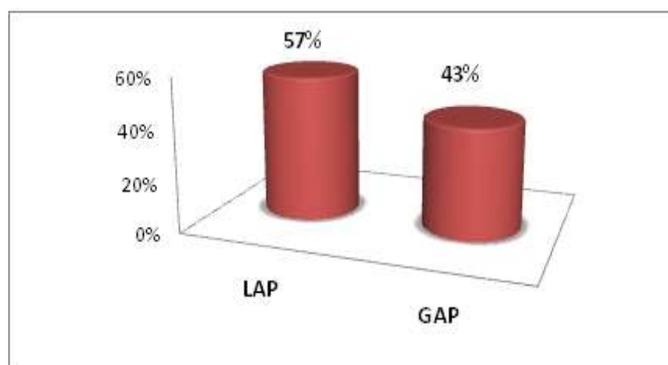


Fig. 11: Localized/Generalized Aggressive Periodontitis

DISSCUSSION

This cross-sectional study was to determine the prevalence of aggressive periodontitis in Moradabad district its association with systemic manifestations in Moradabad district. This survey consisted of 3000 patients, including 1872 males and 1128 females. Forty four out of 3000 patients were diagnosed with aggressive periodontitis. The localized form was more common than the generalized form by a ratio of 1.32:1.

Prevalence of gingivitis was (56%) and Chronic periodontitis was (42%). among the subjects with aggressive periodontitis, those diagnosed with localized aggressive periodontitis (57%) were slightly higher as compared to those with generalized aggressive periodontitis (43%). In contrast, in a study by Imran *et al*²² in Yemeni students, subjects with localized aggressive periodontitis (2.6%) were much higher compared to generalized aggressive periodontitis (1%). Similarly, Chandrakumar *et al.* [23] reported a higher prevalence of localized aggressive periodontitis (71%) as compared to generalized aggressive periodontitis (29%). The variation in prevalence ratios in these previous studies as compared to the present study may reflect the influence of the genetic and environmental factors due to the varying geographical locations.

The average age of the study population was 30.99. In the present study, highest distributions of gingivitis (45%), chronic periodontitis (48%) and aggressive periodontitis (68%) were observed in the 20-30 years, > 40 years and 20-30 years age groups, respectively. In a study by Ababneh *et al.* [7], highest distribution of

gingivitis (34%), chronic periodontitis (38%) and aggressive periodontitis (77%) were observed in 36-45 years and ≤ 25 years. These findings were similar to those observed in the present study. This confirms that AP is usually manifested earlier in life in susceptible individuals.

In the present study, highest proportion of both localized (57%) and generalized (43%) forms were observed in the 20-30 yr age group. These findings are in contrast those of Chandra kumar *et al.* [23] who observed majority of localized aggressive periodontitis patients (82%) in the age group of 13-20 years. The differences may be a reflection of variations in oral hygiene practices and utilization of oral health care services among the different age groups.

In the present study, the overall sex ratio was 2.65:1 (male: female). Higher proportion of subjects with gingivitis (61.1%) and chronic periodontitis (53.91%) were males whereas higher proportion of aggressive periodontitis cases (57 %) were females. A similar pattern of gender distribution was observed in the studies by Ababneh *et al.* [7] (male: 70.4%, female: 29.6%) and Chandra Kumar *et al.* [23] (male: 52%, female: 48%). In contrast, a study by Per Gjermo *et al.* [24] in Brazilian teenagers reported a higher prevalence of bone loss in females (52.3%) as compared to males (47.7%).

Based on the Gingival Index scores, highest numbers of mild cases were observed in gingivitis group (81.60%), moderate cases in aggressive periodontitis

(54.54%) and severe cases in chronic periodontitis (56.12%). The observation of a majority of moderate scores in aggressive periodontitis may indicate that the clinical features of gingivitis were not as severe as in chronic periodontitis, a finding that can be correlated with the destruction of supporting tissues of aggressive periodontitis being less evident. The presence of severe gingivitis in a significant percentage (31.81%) of aggressive periodontitis subjects could be explained by the fact that Aggressive periodontitis undergoes periods of quiescence and exacerbation and the high scores in these subjects may reflect the active stage of the disease.

36 % of aggressive periodontitis patients reported that they often experienced one or more systemic symptoms (mostly fatigue), which they could not relate to disease or to external factors. A lower percentage of chronic periodontitis cases (20%) and gingivitis (about 19.98%) reported the presence of such symptoms. The frequency of the systemic manifestation of fatigue was significantly greater in aggressive periodontitis subjects as compared to gingivitis, and chronic periodontitis. In the study by Ababneh *et al.* [7] fatigue was more prevalent in the chronic periodontitis group. Loss of appetite was significantly greater in subjects with chronic periodontitis as compared to those with gingivitis and aggressive periodontitis, whereas in the previous study loss of appetite was significantly greater in aggressive periodontitis subjects. Weight loss was significantly greater in aggressive periodontitis subjects in this study, but the previous study reported higher prevalence of weight loss in gingivitis subjects [7]. These variations in the distribution of systemic manifestations maybe related to the differences in the study population socio-demographics between the two studies.

Based on the study results, the systemic manifestations of fatigue, loss of appetite and weight loss as well as anxiety and depression were strongly associated with aggressive periodontitis. These findings are in accordance with those of Page *et al.* [25] who suggested that rapidly progressive periodontitis (RPP) progresses in phases of activity and quiescence and that the active phase of rapidly progressive periodontitis (RPP) in a proportion of individuals involves systemic manifestations such as fatigue, weight loss, and loss of appetite.

Based on HAD scale anxiety scores, positive cases were significantly more prevalent in aggressive periodontitis as compared to chronic periodontitis and gingivitis groups. Borderline cases were equally prevalent in chronic periodontitis and aggressive periodontitis groups. Based on HAD scale depression scores, positive cases was same as those for anxiety scale. The frequency of HAD scale for depression among the Study Population was significantly greater in chronic periodontitis. Evaluation of the anxiety and

depression status of the participants in this study, using the HAD scale, demonstrated that subjects diagnosed with aggressive periodontitis exhibited significantly more anxiety and depression, compared to chronic periodontitis patients and controls. Similar scores were obtained in the study by Ababneh *et al.* [7].

The influence of periodontal disease on the human psychological condition has not highlighted much in the past literature. The present study demonstrates an association between aggressive periodontitis and both of anxiety and depression. It would be of interest to know how periodontitis (especially aggressive periodontitis) is related to anxiety and depression.

A probable mechanism that explains the relation between stress and periodontal disease is the deregulation of the immune system, mediated primarily through the hypothalamic– pituitary–adrenal and sympathetic–adrenal medullary axes [26].

In response to a variety of stressful stimuli, an elegant sequence of events is initiated. Activation of the hypothalamic–pituitary–adrenal axis by stress results in the release of an increased concentration of adrenocorticotrophic hormone. The glucocorticoids then produce a myriad of effects throughout the body, such as suppressing the inflammatory response, modifying cytokine profiles, elevating blood glucose levels, and altering levels of certain growth factors [27]. More importantly, it has been established that proinflammatory cytokines, such as interleukin-1, can also activate the hypothalamic–pituitary–adrenal axis, leading to a feedback loop [28].

The second major pathway to be activated is the sympathetic nervous system. A well-known example of this is the so-called ‘flight or fight’ response to potentially harmful stimuli. Stress activates the nerve fibers of the autonomic nervous system, which innervate the tissues of the immune system. The release of catecholamines results in the hormonal secretion of norepinephrine and epinephrine from the adrenal medulla, which results in a range of effects that may act to modulate immune responses [27].

Catecholamines, released during stress, contribute to the development of hyperglycemia by directly stimulating glucose production and interfering with the tissue disposal of glucose [29].

In the present study, a strong association of anxiety was observed in subjects with aggressive periodontitis. This condition may arise, in part, from the concern of losing teeth at a young age. However, this study did not record aspects such as employment levels and socio-economic status which may influence the quality of life and could contribute to anxiety and depression. Also, this study being cross-sectional, the results do not provide evidence whether the psychological symptoms

precede or succeed the onset of periodontal disease. Further studies, preferably longitudinal, are required to enable us to better understand this relationship.

CONCLUSION

A cross-sectional study was conducted to determine the prevalence of aggressive periodontitis and its association with systemic manifestations in Moradabad district. Based on results the following conclusions were drawn –

- The prevalence of aggressive periodontitis was 1.5% in Moradabad district. The localized form was more common than the generalized form.
- The frequency of systemic manifestations such as fatigue, weight loss and loss of appetite was significantly greater in aggressive periodontitis.
- Fatigue was more prevalent in localized aggressive periodontitis subjects whereas loss of appetite and weight loss were more prevalent in generalized aggressive periodontitis subjects.
- Significant co-relation between anxiety/depression and aggressive periodontitis was observed. Prevalence of anxiety and depression were higher in generalized aggressive periodontitis group as compared to localized aggressive group.

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