A CASE CONTROL STUDY TO COMPARE THE PREVALENCE OF PERIODONTAL DISEASE IN PATIENTS WITH AND WITHOUT SYSTEMIC AUTOIMMUNE DISEASES

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CERTIFICATE

This is to certify that this Dissertation submitted by **Dr. S.G.RAMESH KUMAR** (2008 – 2011 Batch), Post Graduate Student, Department of Public Health Dentistry, titled "A case control study to compare the prevalence of periodontal disease in patients with and without systemic autoimmune diseases" was carried out under my guidance in partial fulfillment of the regulations laid down by the **Tamilnadu Dr. M.G.R. Medical University** Chennai for M.D.S in **Public Health Dentistry** (Branch VII) degree examination.

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ABSTRACT

AIM :

The aim of the study is to find, whether the presence of systemic autoimmune diseases in an individual is a risk factor for the development of Periodontal disease.

MATERIALS AND METHODS:

A sample of 253 patients with Systemic autoimmune diseases, attending the Rheumatology department of Madras Medical College and Government General Hospital, Chennai-3 and 262 patients without Systemic autoimmune diseases, attending the outpatient department of the Tamilnadu Government Dental College and Hospital, Chennai -3 constituted the case and control groups. Age, gender and Oral hygiene status matching was done. Oral hygiene status was assessed using Oral Hygiene Index original and Periodontal status was assessed using Community Periodontal Index in association with Loss of Attachment Index. Statistical analysis was done using SPSS version 15.

RESULTS

Results showed 99.2% and 73.9% prevalence of gingivitis and periodontitis respectivelyin the case group as compared to 85.5% and 14.9% in

the control group. Results also showed no linear relationship between oral hygiene scores (OHI-original) and prevalence of periodontitis (CPI & LOA scores) in case group.

CONCLUSION

Patients suffering from systemic autoimmune diseases showed more prevalence of periodontal diseases irrespective of oral hygiene scores. Hence one may assume that the presence of systemic autoimmune diseases in a patient leads to risk in development of periodontal disease. Conversely in patients with periodontal disease with no local factors, one must rule out any undiagnosed systemic autoimmune diseases.

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LIST OF ABBREVIATIONS

CD	-	Cluster of differentiation
TNF	-	Tumour Necrosis Factor
IL	-	Interleukin
PG	-	Prostaglandin
NK	-	Natural Killer
GCF	-	Gingival Crevicular Fluid
SLE	-	Systemic Lupus Erythematosus
Fcγ	-	Fc domain of Immunoglobulin G
ANCA	-	Anti - Neutrophil Cytoplasmic Antibodies
BAFF	-	B cell activating F factor
Anti- CL	-	Anti - Cardiolipin
OHI	-	Oral Hygiene Index
CPI	-	Community Periodontal Index
LOA	-	Loss of Attachment
PIP	-	Proximal Interphalangeal
MCP	-	Meta carpophalangeal
MTP	-	Meta tarsophalangeal
CEJ	-	Cemento Enamel Junction

INTRODUCTION

The immune system protects the host against infection specifically by recognizing and eliminating foreign agents from the body. The immune system does not normally respond to self antigens[1]. The ability to discriminate between self antigens and non-self antigens is tolerance.[2,3] Immunologic tolerance is a state in which the individual is incapable of developing an immune response to a specific antigen which can be achieved by various routes[4].

Autoimmune diseases comprise a group of disorders where there is nothing apparently in common other than an exaggerated immune response to one or more of the self antigens.[5] The term autoimmune diseases refer to a disorder in which there is evidence of an immune response against self. The functional abnormality in immunologic self- tolerance directly leads to the development of autoimmune diseases.[6] A common feature of all autoimmune diseases is the presence of auto-antibodies and inflammation including mononuclear phagocytes, autoreactive T lymphocytes and plasma cells (autoantibody producing B cells).

Autoimmune diseases are classified into[7,]

i) Organ specific autoimmune diseases and

ii) Non organ specific (Sytemic) autoimmune diseases.

Major pathogenic role in many autoimmune diseases lies behind the damage induced by cells of the immune system against own body cells. The predominant infiltrating cells in autoimmune diseases include phagocytic macrophages, neutrophils, self-reactive Cluster of differentiation(CD) 4+ T helper cells and self-reactive CD8+ cytolytic T cells, with smaller numbers of natural killer(NK) cells, mast cells and dendritic cells. Immune cells damage tissues directly by killing cells or indirectly by releasing cytotoxic cytokines, prostaglandins(PG), reactive nitrogen or oxygen intermediates.[7,8] Pathogenic mechanism common to autoimmune diseases is the increased production of the cytokines, such as Tumour necrosis factor (TNF) and Interleukin factor(IL) -1b.[7]

Periodontal disease is characterized by a chronic infection and inflammation in the periodontal tissue leading to the destruction of the bone surrounding the teeth and ultimately to dental loss.[9] Periodontal disease which includes gingivitis and periodontitis,[10] is one of the most common chronic disorders of infectious origin known in humans with a high prevalence in adults. The paradigm of immune responses is consistent with the specific plaque hypothesis, current concepts in immunology and the classic clinical and histologic observations.

Pathogenic mechanism common to autoimmune diseases[7] and Periodontal disease[11] is the increased production of the cytokines TNF and IL-1b. Susceptible patients exhibit an abnormal immune mediated inflammatory response.[12] In rheumatoid arthritis there may be increased propensity to overproduce these inflammatory mediators which could possibly lead to increased periodontal destruction.[13] In both rheumatoid arthritis (a type of autoimmune diseases) and periodontal diseases, are associated with destruction of bone, mediated by inflammatory cytokines such as IL-1, TNF and PGE2.[13]

Immune mechanism both for systemic autoimmune diseases and periodontal disease shares some common pathway in their effects. Hence this study has been done to prove the correlation between the above two entities.

AIMS AND OBJECTIVES

AIM:

The aim of the study is to find, whether the presence of systemic autoimmune diseases in an individual is a risk factor for the development of periodontal diseases of patients.

OBJECTIVES:

- To assess the Oral hygiene status of patients with and without Systemic autoimmune diseases using Oral Hygiene Index original by Greene and Vermillon in 1960.
- To assess the periodontal conditions of patients with and without Systemic autoimmune diseases using Community Periodontal Index with Loss of Attachment by WHO in 1997.
- Compare prevalence of periodontal diseases between patients with and without Systemic autoimmune diseases.

REVIEW OF LITERATURE

Systemic autoimmune diseases

Systemic autoimmune diseases are a complex, heterogeneous group of diseases in which the immune system targets a diverse, but highly specific group of intracellular autoantigens[14]. Systemic autoimmune diseases are generally characterized by the production of autoantibodies that directed against intracellular antigens[15] and recognize a diverse array of cytoplasmic and nuclear antigens[16]. In systemic autoimmune diseases, individuals develop auto-antibodies directed against a variety of cellular components. It is remarkable that a particular set of autoantibody specificities is associated with each disease[17].

Periodontal disease

Periodontal disease include pathological conditions of the supporting structures of the teeth i.e., gingiva, alveolar bone, periodontal ligament and cementum. Progression of periodontal disease is considered to be a continuous process rather than a episodic pattern. It is considered to be a continuous process with acute periods of exacerbation[18].

Immune mechanism in systemic autoimmune diseases

Kazutaka Shibatomi et al., in 2001[19] evaluated the relationship between serum cytokine levels and peripheral blood Natural killer cell number in 58 Japanese patients with systemic autoimmune diseases, compared with 33 healthy controls and examined the role of IL-18 in human NK cell death in vitro. Data revealed that increased levels of cytokines correlate with reduced numbers of NK cells in these patients. High levels of IL-18 and IL-15 are associated with the decreased number of NK cells that is observed in patients with systemic autoimmune diseases.

Dennis M Klinman and Alfred D.Steinberg in 1987[20] conducted a animal study in mice and suggested that systemic autoimmunity results from generalized polyclonal activation and not from specific stimulation of autoreactive clones.

Immune mechanism in periodontal disease

Lappin DF et al., in 2003[21] evaluated from a study conducted using tissue biopsies from 12 periodontitis patients that overall the mucosal immune response plays a minor role and acts on superficial tissues only. The systemic immune plays a predominant role in the disease mechanism. It is well known that there is a shift from a predominantly T-cell to B-cell lesion in the

progression from health to gingivitis and periodontitis. Thus this shift occurs during the development of periodontal disease.

Denis F Kinane et al., in 1999[22] conducted a study using tissue biopsies of 9 adult periodontitis patients and concluded that immune mechanisms involved in the pathogenesis of periodontitis may involve features of both the mucosal and systemic immune systems, dependent on tissue location.

Rheumatoid arthritis and Periodontal disease:

Eduardo de Paula Ishi et al., in 2008[13], performed a study among 29 rheumatoid arthritis patients with 22 healthy controls to find the association between periodontitis and rheumatoid arthritis and the results showed that, the test group (patients with rheumatoid arthritis) presented a higher frequency of sites with attachment loss greater than or equal to 5 mm than the control group. Rheumatoid arthritis patients might be predisposed to periodontitis since they presents a higher risk for infections (due to medication-induced immunosuppression) and for inflammatory-mediated destruction (due to an unbalanced cytokine expression profile).

G.A.Scardina and P.Messina in 2007[23] conducted a study to investigate the differences in periodontal microcirculation between 30

healthy subjects and 30 rheumatoid arthritis patients. The study showed that capillary alterations in patients suffering from rheumatoid arthritis occur in periodontal microcirculation; such evidence could be extremely important, suggesting that microvascular periodontal alterations may play a crucial part in the complex activity associated with periodontal disease in arthritis patients.

Biyikoglu B. Buduneli et al., in 2006[24] studied 27 rheumatoid arthritis patients, 17 systemically healthy subjects with periodontal disease and 17 systemically and periodontally healthy subjects, to evaluate if co-existence of periodontitis and rheumatoid arthritis had an additional effect on the severity of the two diseases and to evaluate the correlation between clinical situation and gingival crevicular fluid (GCF) levels of inflammatory mediators. The study suggested that, the coexistence of rheumatoid arthritis and periodontitis does not seem to affect clinical periodontal findings or systemic markers of rheumatoid arthritis. Similar inflammatory mediator levels in rheumatoid arthritis and periodontal disease groups, despite the long-term usage of corticosteroids, non-steroidal anti-inflammatory drugs, suggest that rheumatoid arthritis patients may have a propensity to overproduce these inflammatory mediators.

Anne Havemose-Poulsen el al., in 2006[25] conducted a study on 18 subjects of localized aggressive periodontitis, 27 subjects of

generalised aggressive periodontitis, 10 subjects of juvenile idiopathic arthritis, 23 subjects of rheumatoid arthritis and 25 healthy subjects to elucidate whether all subjects share periodontal and hematological characteristics distinguishing them from healthy individuals. The results suggested that patients with rheumatoid arthritis may acquire periodontal destruction early in the course of disease. Patients with generalized aggressive periodontitis may present with elevated levels of traditional markers of inflammation similar to patients with rheumatoid arthritis and juvenile idiopathic arthritis. Thus, similarities in periodontal and hematological variables were seen in individuals with aggressive periodontitis, juvenile idiopathic arthritis, and rheumatoid arthritis, distinguishing them from controls.

Lagervall M Jansson et al., in 2003[26] studied the population of 1006 subjects to explore possible relationships between general health and periodontal disease severity. The results showed no significant associations between investigated systemic disorders and periodontal disease severity were found if the relative frequency of deep periodontal pockets was used as the clinical parameter for periodontal disease severity. However, cardiovascular disease, diabetes and rheumatoid disease were found to be significantly correlated to number of lost teeth, which may represent one aspect of periodontal health. This result held true in nonsmokers only.

F.B.Mercado et al., in 2001[27] studied 65 subjects with rheumatoid arthritis and healthy subjects corresponding to it, to determine the extent of their periodontal disease and correlate this with various indicators of rheumatoid arthritis. The results showed that the relationship between disease experience of rheumatoid arthritis and periodontitis can be demonstrated by assessing a defined group of individuals diagnosed with rheumatoid arthritis using standard clinical and laboratory parameters. Indeed those individuals who have moderate to severe rheumatoid arthritis are also very likely to suffer from moderate to severe periodontitis.

Fatma Yesim Bozkurt et al in 2000[28] conducted a study in 15 patients with rheumatoid arthritis and adult periodontitis, 15 patients with adult periodontitis and 15 healthy subjects to determine and compare IL-6 levels in GCF in patients with rheumatoid arthritis and adult periodontitis. The results showed no significant difference detected in the clinical parameter except plaque index. There was only strong negative correlation between GCF and IL -6 levels in the rheumatoid arthritis group.

Systemic lupus erythematosus and Periodontal disease:

Tetsuo Kobayashi et al., in 2003[29] studied 42 systemic lupus erythematosus (SLE) patients with periodontitis, 18 SLE patients without periodontitis, 42 healthy subjects with periodontitis and 42 healthy

subjects without periodontitis to evaluate whether Fc domain of Immunoglobulin G (FcγR) gene polymorphisms are associated with periodontitis risk in SLE patients. It had been documented that the low ligand binding Fcγ RIIa- R131allele was associated with periodontitis risk in SLE patients. Identification of FcγR genotypes might be reliable strategy for predicting the onset of periodontitis in SLE patients.

Ernesto Nova et al., in 1999[30] conducted a study on 30 patients with SLE, 30 patients with rheumatoid arthritis and 20 healthy subjects. The results showed a marked difference in the number and distribution of anti-neutrophilic cytoplasmic antibodies (ANCA) with respect to periodontitis between rheumatoid

arthritis and SLE was found. hyperresponsiveness of B cells and polyclonal B activation to periodontopathic bacteria in SLE might be accountable for the high numbers of ANCA and the close association observed between those autoantibodies and periodontitis in SLE.

Sjogrens syndrome and Periodontal disease:

Jacques Olivier Pers et al., in 2005[31] studied 15 patients of primary sjogrens syndrome and 15 xerostomia patients as control group to correlate the periodontal status of primary sjogrens syndrome patients with salivary B cell activating F factor (BAFF) levels. The study suggested that

the findings of bone resorption in primary sjogrens syndrome are similar to that observed in patients with rheumatoid arthritis. They also suggested that the known effect of B cells in periodontitis would be partly mediated by salivary BAFF in patients with primary sjogrens syndrome.

Kuru.B et al., in 2002[32] conducted a study consisting of 8 primary sjogrens syndrome patients, 10 secondary sjogrens syndrome patients and 11 healthy subjects as control group to evaluate whether the periodontal status of sjogrens syndrome patients in terms of clinical and microbiological parameters differ from systemically healthy individuals. The results suggested that there was no significant differences could be detected in either clinical or microbiological parameters of primary or secondary sjogrens syndrome patients compared with that of control subjects. Thus results of the study supported the notion status; microbiology; peptidase activity; polymerase chain reaction that the periodontal status of patients with sjogrens syndrome do not differ from systemically healthy age- and gender-matched controls.

Boutsi et al., in 2000[33] performed a study on 24 sjogrens syndrome patients, 27 other autoimmune disease patients and 29 subjects with subjective feeling of xerostomia to evaluate the dental and periodontal condition and influence of reduced salivary flow in the periodontal tissues. The results showed no significant difference could be detected concerning the

dental and periodontal status of Sjogrens syndrome patients, compared with that of other patients.

Systemic sclerosis and periodontal disease

G.A.Scardina et al., in 2005[34] conducted a study in 15 patients with systemic sclerosis and 15 healthy patients to observe differences in periodontal microcirculation between healthy patients and patients with systemic sclerosis. The results showed the microvascular changes in systemic sclerosis compared to healthy patients. Capillary alterations in patients with systemic sclerosis are also occur in periodontal mucosa microcirculation.

Spondyloarthropathy and periodontal disease

N.Pischon et al., in 2010[35], studied 48 patients with ankylosing spondylitis and 48 healthy controls to determine association between ankylosing spondylitis and periodontal disease. The results showed that there was 6.81 fold increased odds of periodontal disease in patients with ankylosing spondylitis as compared with healthy controls.

Inflammatory myopathies and periodontal disease

Krisztina Marton et al., in 2005[36] performed a complete analysis of orofacial abnormalities in 34 patients with polymyositis and

dermatomyositis The results could not demonstrate any difference in the severity of periodontal destruction between patients and healthy controls.

Antiphospholipid syndrome and periodontal disease

Schenkein.H.A et al., in 2007[37] conducted a study on 190 patients with generalized aggressive or chronic periodontitis and 90 healthy subjects. It showed elevated serum levels of vascular inflammation markers in patients with higher anti-cardiolipin (anti-CL) autoantibodies (anti-phospholipid antibodies) which are higher in antiphospholipid syndrome and SLE patients.

Vasculitis and periodontal disease

Haviye Celenligil- Nazliel et al in 1999[38] studied about periodontal condition of 33 patients with Behcet's disease and 15 health subjects. The results showed values of probing depth, plaque index, periodontal index and sulcular bleeding index were more in patients with Behcet's disease than healthy subjects.

There were no studies that directly enumerate the periodontal status of patients with adult onset still's disease and mixed connective tissue disease.

MATERIALS AND METHODS

STUDY TYPE:

It is a case control study.

a) Case group:

Case group constituted 253 patients with systemic autoimmune diseases attending the Rheumatology department of Government General Hospital, Chennai-3.

b) Control group:

Control group constituted 262 patients without systemic autoimmune diseases matched for age, gender and Oral Hygiene Index (OHI) scores attending the outpatient department of the Tamilnadu Government Dental College & Hospital, Chennai-3.

INCLUSION CRITERIA:

1) Subjects with non organ specific autoimmune diseases for case group.

2) Subjects without systemic autoimmune diseases for control group.

EXCLUSION CRITERIA:

1) Organ specific autoimmune diseases are excluded.

2) Patients with any other systemic diseases.

STUDY PROTOCOL

- A complete case history was recorded for both groups. Written informed consent obtained.
- Age (Subgroups: 15-24, 25-34, 35-44, 45-54, 55-64, and 65-74 years), gender (Subgroups: Male and female) and Oral hygiene scores (Subgroups: OHI-original score 0-4.0, 4.1-8.0 and 8.1-12.0) matching has been performed between case group and control group.
- Patients already diagnosed with systemic autoimmune diseases at Govt. General Hospital, Chennai -3 (after history, clinical examination, diagnostic tests and markers) contributed the case group.
- Patients without systemic autoimmune diseases attending the outpatient department of Tamilnadu Govt. Dental College & Hospital, Chennai -3 contributed the control group after matched for age, gender and OHI scores.
- Oral hygiene status of patients with and without systemic autoimmune diseases (case group and control group) were assessed using Oral Hygiene Index (OHI)[39] original by Greene and Vermillion in 1960 criteria.
- Periodontal condition of patients were assessed using Community Periodontal Index (CPI) [40] with Loss of Attachment (LOA) by WHO 1997.
- Values were tabulated and Scores were compared between case group and control group to analyze the prevalence of periodontal disease.

ARMAMENTARIUM USED

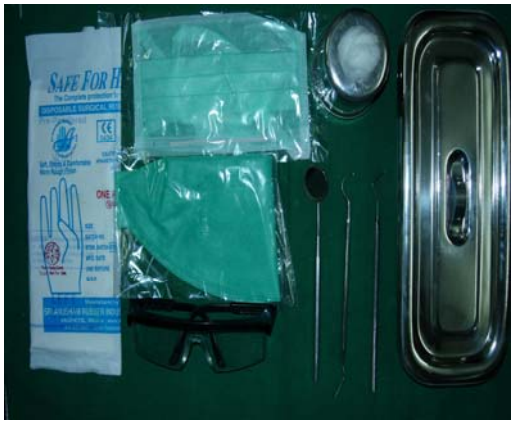
Universal precautions taken.

Examination was done using

- Plain mouth mirror
- Explorer
- Tweezer
- CPI Probe
- Cotton

PHOTOGRAPH -1

Armamentarium



PHOTOGRAPH - 2

Measuring probing depth using CPI probe

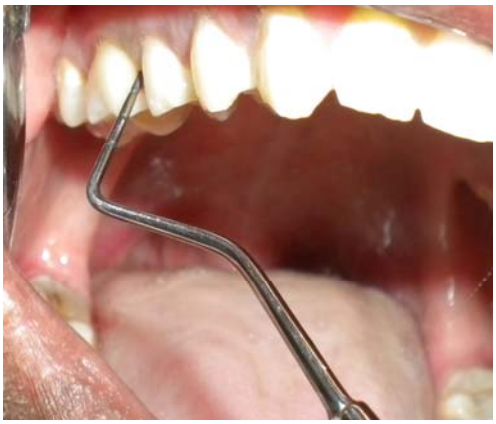


TABLE -1

List of organ specific autoimmune diseases[41]

Organ	Autoimmune disease
Thyroid	Autoimmune thyroiditis, Primary myxedema, Thyrotoxicosis, Grave's disease
Parathyroid	Parathyroid insufficiency
Pancreas	Insulin resistant diabetes associated with acanthosis nigricans, Insulin resistant diabetes with ataxia telengiectasia, Insulin dependent diabetes.
Adrenals	Addison's Disease
Gonads	Premature ovarian failure
Gastrointestine	Atropic gastritis, Ulcerative colitis, Crohn's disease, Autoimmune chronic active hepatitis, Primary biliary cirrhosis, Pernicious anaemia
Skin	Pemphigus Vulgaris, Bullous pemphigoid, Cicatrical pemphigoid, Dermatitis Herpetiformis
Others	Myasthemia gravis, Good pasteur's syndrome, Autoimmune heamolytic anaemia, Demyelinating herpetiformis

TABLE - 2

List of systemic autoimmune diseases

(non –organ specific) [41,42,43]

S.No	Systemic autoimmune diseases
1	Rheumatoid arthritis
2	Systemic lupus erythematosus
3	Systemic sclerosis
4	Sjogrens syndrome
5	Vasculitis
6	Inflammatory myopathies a. Dermatomyositis b. Polymyositis c. Inclusion body myositis
7	Spondyloarthropathy
8	Mixed connective tissue disease
9	Antiphospholipid syndrome
10	Adult onset still's disease

TABLE - 3

Revised criteria for the classification of rheumatoid arthritis – 1987[44]

S.No	Criteria	Definition
1	Morning Stiffness	Morning stiffness in and around the joints, lasting atleast 1 hour before maximal improvement.
2	Arthritis of 3 or more joint areas	At least 3 joint areas simultaneously have had soft tissue swelling or fluid (not bony growth alone) observed by a physician. The 14 possible areas are right or left Proximal Interphalangeal (PIP), Meta Carpophalangeal (MCP), Wrist, Elbow, Knee, Ankle and Meta Tarsophalangeal (MTP) joints.
3	Arthritis of hand joints	Atleast 1 area swollen in a wrist, MCP or PIP joint.
4	Symmetric Arthritis	Simultaneous bilateral involvement of same joint areas on both sides of the body.(Bilateral involvement of PIPs , MCPs or MTPsis acceptable without acceptable symmetry).
5	Rheumatoid nodules	Subcutaneous nodules, over bony prominences or extensor surfaces or in juxtaarticular regions, observed by physician.
6	Serum rheumatoid factor	Demonstration of abnormal amounts of serum rheumatoid factor by any method for which the result has been positive in < 5% of normal control subjects.
7	Radiographic changes	Radiographic changes typical of rheumatoid arthritis on posteroanterior hand and wrist radiographs which must include erosions or unequivocal bony decalcification localized in or most marked adjacent to the involved joints (osteoarthritis changes alone do not qualify).
A patient shall be said to have Rheumatoid arthritis if he/she has satisfied at least 4 of these 7 criteria. Criteria 1 through 4 must have been present for atleast 6 weeks. Patient with 2 clinical diagnosis are not excluded.		

PHOTOGRAPH -3 RHEUMATOID ARTHRITIS

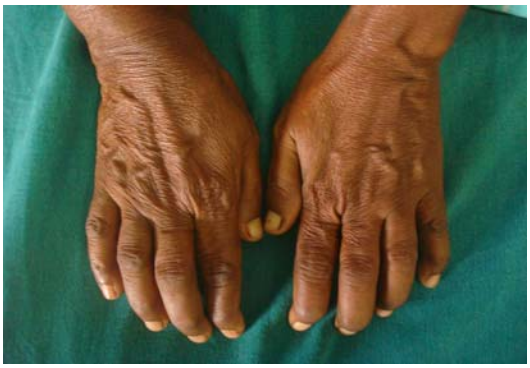


TABLE - 4

Revised criteria for the classification of systemic lupus erythematosus – 1982[45]

S.no	Criteria	Definition
1	Malar Rash	Fixed erythema flat or raised over the malar eminences tending to spare the nasolabial folds.
2	Discoid Rash	Erythematous raised patches with adherent keratotic scaling and follicular plugging, atropic scarring may occur in older lesions.
3	Photosensitivity	Skin rash as a result of unusual reaction to sunlight by patient history or physician observation.
4	Oral Ulcers	Oral or nasopharyngeal ulceration usually painless observed by a physician.
5	Arthritis	Nonerosive arthritis involving 2 or more peripheral joints charecterised by tenderness, swelling or effusion.
6	Serositis	a) Pleuritis - convincing history of pleuritic pain or rub heard by a physician or evidence of pleural effusion. (OR) b) Pericarditis – documented by ECG or rub or evidence of pericardial effusion.
7	Renal disorder	a) persistent proteinuria greater than 0.5 grams per day or greater than 3+ if quantitation not performed. (OR) b) Cellular casts – may be red cell, Haemoglobin, granular, tubular or mixed.
8	Neurologic disorder	a) seizures - in the absence of offending drugs or known metabolic derangements; e.g.uremia, ketoacidosis or electrolyte imbalance (OR) b) Psychosis – in the absence of offending drugs or known metabolic derangements; e.g.uremia, ketoacidosis or electrolyte imbalance
9	Haematologic disorder	a) Haemolytic anaemia – with reticulosis (OR) b) Leukopenia – less than 4,000/mm^3 total on 2 or more occasions (OR) c) Lymphopenia – less than 1,500/mm^3 on 2 or more occasions (OR) d) Thrombocytopenia – less than 1,00,000/mm^3 in the absence of offending drugs.
10	Immunological disorder	a) Positive LE cell preparation (OR) b) Anti – DNA : antibody to native DNA in

		abnormal titer (OR) c) Anti – Sm: Presence of antibody to Sm nuclear antigen (OR) d) False positive serological tests for syphilis known to be positive for atleast 6 months and confirmed by Treponema pallidum immobilization or fluorescent treponemal antibody absorption test.
11	Antinuclear antibody	An abnormal titer of antinuclear body by immunofluorescence or an equivalent assay at any point in time and in the absence of drugs known to be associated with "drug induced lupus" syndrome.
For the purpose of identifying patients in clinical studies, a person shall be said to have Systemic Lupus Erythematosus if any 4 or more of the 11 criteria are present, serially or simultaneously during any interval of observation.		

PHOTOGRAPH - 4

SYSTEMIC LUPUS ERYTHEMATOSUS

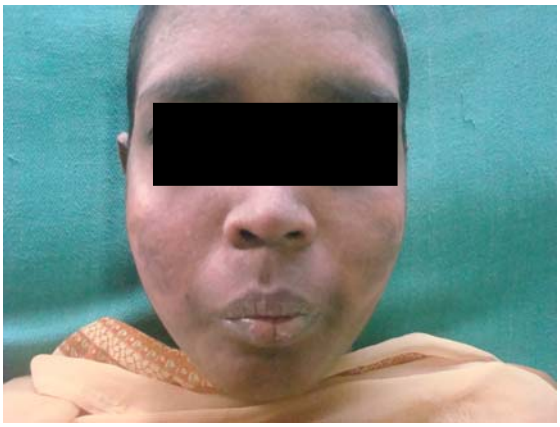


TABLE - 5

American rheumatology association classification criteria for systemic sclerosis - 1980

S.No	Criteria	Definition
1	Major criteria	Proximal scleroderma: thickening, tautness of fingers and the skin proximal of metacarpophalangeal and metatarsophalangeal joints
2	Minor criteria	1. Sclerodactyly: thickening, tautness of the skin, limited on fingers 2. Digital pitting scars of fingertips or loss of substance of distal finger pad 3. Bibasilar pulmonary fibrosis
One major or two or more minor criteria have to be fulfilled		

PHOTOGRAPH - 5

SYSTEMIC SCLEROSIS

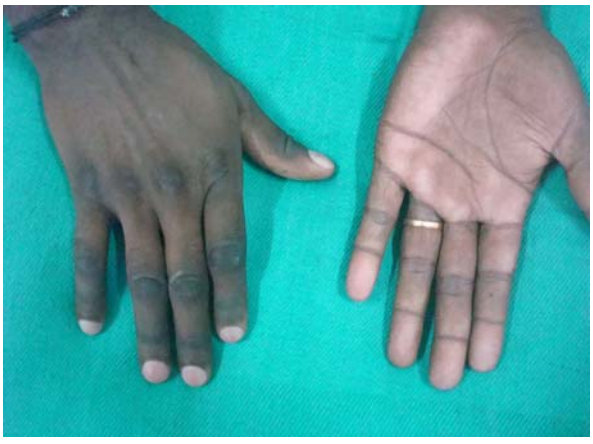


TABLE - 6

European community criteria for diagnosis of sjogren's syndrome-1996[46]

S.no	Signs & Symptoms	Definition
1	Ocular symptoms	At least one of the following: a) Daily dryness of eyes for longer than three months b) Recurrent sensation of having sand or gravel in the eyes c) Use of artificial tears more than three times Per Day
2	Oral symptoms	At least one of the following: a) Daily dryness of mouth, or xerostomia, for longer than three months b) Recurrent or persistent swelling of salivary glands c) Frequent use of liquids to assist in swallowing food
3	Ocular signs	At least one of the following: a) Schimmer's test result of 5 millimeters or less of tear production in five minutes b) Rose bengal test score of 4 or higher (rose bengal dye stains desiccated epithelial cells of the cornea and conjunctiva)
4	Oral signs	At least one of the following: a) Abnormal results of salivary scintigraphy b) Abnormal results of sialography c) Unstimulated salivary flow of 1.5 ml or less in 15 Minutes
5	Histopathology	a) Inflammatory focus score of one or more per 4 square millimeters of glandular tissue (a focus score is defined as a cluster of 50 or more lymphocytes)
6	Autoantibodies	Presence of one or more of the following: a) Antinuclear antibodies b) Rheumatoid factor c) Anti-Ro/anti–SS-A d) Anti-La/anti–SS-B
Diagnosis of Sjogren's syndrome requires four of the above 6 criteria be met, after exclusion criteria ruled out. Exclusion criteria are pre-existing lymphoma, acquired immunodeficiency syndrome, sarcoidosis or graft-vs.-host disease.		

TABLE - 7

American college of Rheumatology criteria for vasculitis – 1990[47]

S.No		Criteria
1	Giant cell (temporal) arteritis (GCA)	1. Age .50 years at onset 2. New type of headache 3. Abnormal temporal artery on examination 4. Elevated erythrocyte sedimentation rate 5. Temporal artery biopsy shows vasculitis Sensitivity 93.5%, specificity 91.2% for 3 criteria
2	Takayasu arteritis	1. Age ,40 years at onset 2. Limb claudication 3. Decreased brachial artery pulses 4. Blood pressure .10 mg Hg difference between arms 5. Bruits 6. Abnormal arteriogram Sensitivity 90.5%, specificity 97.8% for 3 criteria
3	Polyarteritis nodosa (PAN)	1. Weight loss .4 kg 2. Livedo reticularis 3. Testicular pain or tenderness 4. Myalgias, myopathy, or tenderness 5. Neuropathy 6. Hypertension (diastolic .90 mg Hg) 7. Renal impairment (elevated blood urea nitrogen or creatinine) 8. Hepatitis B virus 9. Abnormal arteriography 10. Biopsy of artery showing neutrophils Sensitivity of 82.2%, specificity 86.6% for 3 criteria
4	Wegener granulomatosis (WG)	1. Nasal or oral inflammation 2. Chest X-ray showing nodules, infiltrates, or cavities 3. Microscopic hematuria or red cell casts in urine 4. Granulomatous inflammation on biopsy Sensitivity of 88.2%, specificity 92% for 2 criteria
5	Churg-Strauss syndrome (CSS)	1.Asthma 2. Eosinophilia (.10%) 3. Neuropathy

		4. Pulmonary infiltrates (non-fixed) 5. Extravascular eosinophils on biopsy Sensitivity 85%, specificity 99.7% for 4 criteria
6	Henoch-Schonlein purpura (HSP)	1. Palpable purpura 2. Age at onset ,20 years 3. Bowel angina 4. Vessel wall neutrophils on biopsy Sensitivity 87%, specificity 88% for 2 criteria
7	Cutaneous leukocytoclastic Vasculitis	1. Age 16 years at onset 2. Medications that may have precipitated event 3. Palpable purpura 4. Cutaneous eruption 5. Positive biopsy results Sensitivity of 71%, specificity 83.9% for 3 criteria

PHOTOGRAPH - 6

VASCULITIS

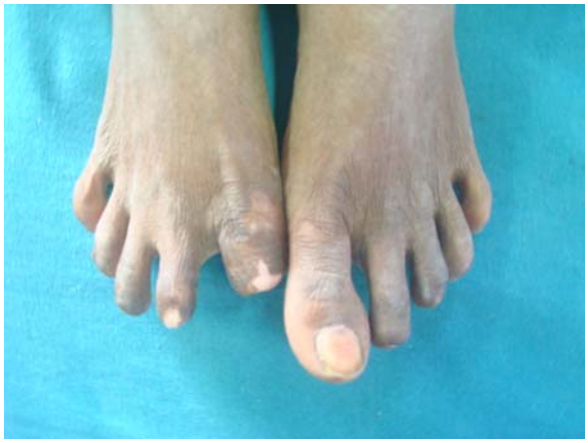


TABLE - 8

Classification criteria for inflammatory myopathies[48,49]

POLYMYOSITIS & DERMATOMYOSITIS – 2001	
S.No	**Criteria**
1	SKIN LESIONS a) Heliotrope: Red-purple edematous erythema on the upper palpebra b) Gottron's sign: Red-purple keratotic, atrophic erythema or macules on the extensor surface of finger joints Erythema on the extensor surface of extremity joints, slight raised red-purple erythema over elbows or knees
2	Proximal muscle weakness upper or lower extremity and trunk.
3	Elevated serum creatine kinase or aldolase level
4	Muscle pain on grasping or spontaneous pain
5	Myogenic changes on electromyography Short-duration, polyphasic motor unit potentials with spontaneous fibrillation potentials
6	Positive anti-Jo-1 antibody test Histidyl-tRNA synthetase
7	Nondestructive arthritis or arthralgias
8	Systemic inflammatory signs a) Temperature: more than 37°C [98.6°F] at axilla, b) Elevated serum C-reactive protein level or c) Accelerated erythrocyte sedimentation rate of more than 20 mm per hour by Westergreen)
9	Pathologic findings compatible with inflammatory myositis (inflammatory infiltration of skeletal evidence of active regeneration may be seen)
Patients presenting with at least one finding from item 1 and four findings from items 2 through 9 are said to have dermatomyositis. Patients presenting with at least four findings from items 2 through 9 are said to have polymyositis	

INCLUSION BODY MYOSITIS – 1987		
S.No	**Criteria**	**Definition**
1	Pathologic Criteria	Electron microscopy Microtubular filaments in the inclusions Light microscopy 1) Lined vacuoles 2) Intranuclear or intracytoplasmic inclusions, or both
2	Clinical Criteria	1) Proximal muscle weakness (insidious onset) 2) Distal muscle weakness 3) Electromyographic evidence of a generalised myopathy 4) Increase in muscle enzyme levels 5) Failure of muscle weakness to improve on a high dose regimen of corticosteroids (at least 40- 60 mg/day for three to four months)
Definite inclusion body myositis requires pathological electron microscopy criterion I and clinical criterion 1 plus one other clinical criterion. Probable inclusion body myositis requires pathological light microscopy criterion I and clinical criterion I plus three other clinical criteria. Possible inclusion body myositis requires pathological light microscopy criterion 2 plus any three clinical criteria.		

PHOTOGRAPH - 7

DERMATOMYOSITIS

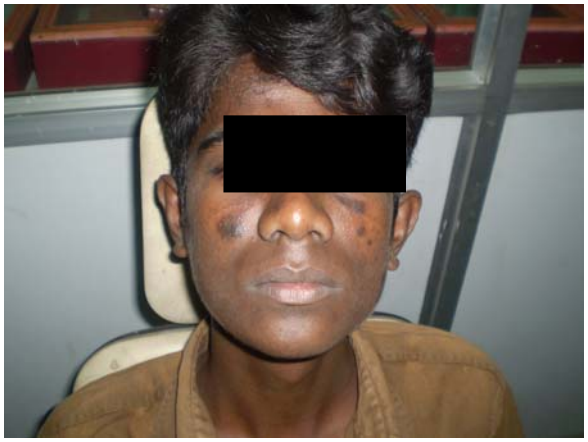


TABLE – 9

Classification criteria for spondyloarthropathies - 1991[50]

Criterion	Definition
Inflammatory spinal pain with at least four of the following five components: a) At least 3 months in duration b) Onset before 45 years of age c) Insidious (gradual) onset d) Improved by exercise e) Associated with morning spinal stiffness	History of or current symptoms of spinal pain (low, middle, and upper back, or neck region)
Synovitis	Past or present asymmetric arthritis, or arthritis predominately in the lower limbs
Spondyloarthropathy	Presence of inflammatory spinal pain or synovitis and one or more of the following conditions: a) Family history: first- or second-degree relatives with ankylosing spondylitis, psoriasis, acute iritis, reactive arthritis, or inflammatory bowel Disease b) Past or present psoriasis, diagnosed by a physician c) Past or present ulcerative colitis or Crohn's disease, diagnosed by a physician and confirmed by radiography or endoscopy d) Past or present pain alternating between the two buttocks e) Past or present spontaneous pain or tenderness at examination of the site of the insertion—the Achilles tendon or planter fascia (enthesitis)

	f) Episode of diarrohea occurring within 1 month before onset of arthritis g) Nongonococcal urethritis or Cervicitis occurring within 1 month before onset of arthritis h) Bilateral grade 2–4 sacroiliitis or unilateral grade 3 or 4 sacroiliitis*

PHOTOGRAPH - 8

SPONDYLOARTHROPATHY

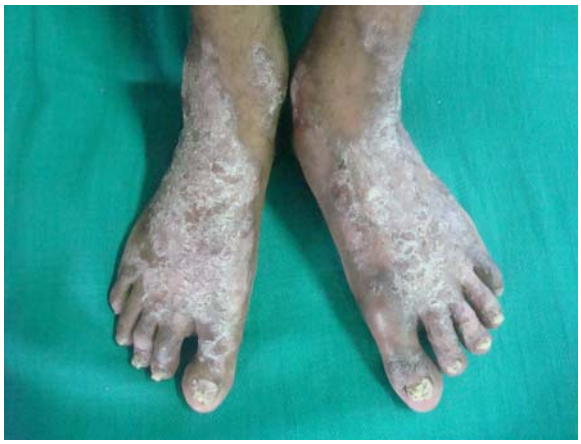


TABLE - 10

Diagnostic criteria for mixed connective tissue disease - 1987[51]

Common Symptoms	Raynaud's phenomenon, Swollen fingers or hands	
Anti–U1 small nuclear RNP positive		
Mixed findings	Systemic lupus erythematosus–like findings	Polyarthritis lymphadenopathy Facial erythema Pericarditis or pleuritis Leukopenia (4000/mm3) or thrombocytopenia (100000/ mm3)
	Systemic sclerosis–like findings	Pulmonary fibrosis, restrictive changes of the lung (forced vital capacity ,80% of predicted), or reduced carbon monoxide diffusing capacity (70% of predicted) Hypomotility or dilatation of esophagus
	Polymyositis-like findings	Muscle weakness Elevated serum level of muscle enzymes (creatine kinase) Myogenic pattern on electromyogram

Diagnosis: Mixed connective tissue disease will be diagnosed when all 3 conditions are fulfilled.

1. Presence of 1 or both common symptoms
2. Positive anti–U1 snRNP antibody
3. Presence of 1 or more findings in at least 2 of the 3 disease categories under "mixed findings"

TABLE - 11

Classification criteria for definite Antiphospholipid syndrome - 1999[52]

S.No	Criteria	Definitions
1	Clinical criteria	Vascular thrombosis One or more clinical episodes of arterial, venous, or small vessel thrombosis, in any tissue or organ. Thrombosis must be confirmed by imaging or doppler studies or histopathology, with the exception of superficial venous thrombosis. For histopathologic confirmation, thrombosis should be present without significant evidence of inflammation in the vessel wall.
		Pregnancy morbidity (a) One or more unexplained deaths of a morphologically normal foetus at or beyond the 10th week of gestation, with normal foetal morphology documented by ultrasound or by direct examination of the fetus, or (b) One or more premature births of a morphologically normal neonate at or before the 34th week of gestation because of severe preeclampsia or eclampsia, or severe placental insufficiency , or (c) Three or more unexplained consecutive spontaneous abortions before the 10th week of gestation, with maternal anatomic or hormonal abnormalities and paternal and maternal chromosomal causes excluded.
		Anticardiolipin antibody of IgG and/or IgM isotype in blood, present in medium or high titer, on 2 or more occasions, at least 6 weeks apart, measured by for b2-glycoprotein I–dependent anticardiolipin antibodies
		Lupus anticoagulant present in plasma, on 2 or more occasions at least 6 weeks apart, detected according to

2	Laboratory criteria	the guidelines of the International Society on Thrombosis and Hemostasis (Scientific Subcommittee on Lupus Anticoagulants/Phospholipid-Dependent Antibodies) , in the following steps: (a) Prolonged phospholipid-dependent coagulation demonstrated on a screening test, e.g., activated partial thromboplastin time, kaolin clotting time, dilute Russell's viper venom time, dilute prothrombin time, Textarin time. (b) Failure to correct the prolonged coagulation time on the screening test by mixing with normal platelet-poor plasma. (c) Shortening or correction of the prolonged coagulation time on the screening test by the addition of excess phospholipid. (d) Exclusion of other coagulopathies, e.g., factor VIII inhibitor or heparin, as appropriate.

Definite antiphospholipid antibody syndrome is considered to be present if at least 1 of the clinical criteria and 1 of the laboratory criteria are met.

TABLE - 12

Diagnostic criteria for Still's disease -2000[53]

S.NO	CRITERIA	DEFINITION
1	Major Criteria (Two Points)	Quotidian fever > 39°C
		Still's (evanescent) rash
		WBC > 12.0 + ESR > 40 mm/h
		Negative Rheumatoid factor and Anti-nuclear antibody
		Carpal ankylosis
2	Minor Criteria (One Point)	Onset age < 35 years
		Arthritis
		Prodromal sore throat
		Reticulo endothelial system involvement or abnormal Liver Function Tests
		Serositis
		Cervical or tarsal ankylosis

Probable Still's Disease: 10 points with 12 weeks' observation

Definite Still's Disease: 10 points with six months' observation

TABLE -13

Scoring criteria for oral hygiene index

Debris index component	
Score	**Criteria**
0	No debris or stain present
1	Soft debris covering not more than 1/3 of the tooth surface. and/or presence of extrinsic stains without other debris regardless of surface area covered.
2	Soft debris covering more than 1/3, but not more than 2/3 of the exposed tooth surface.
3	Soft debris covering more than 2/3 of the exposed tooth surface.
Calculus index component	
Score	**Criteria**
0	No calculus present
1	Supragingival calculus covering not more than 1/3 of the exposed tooth surface.
2	Supragingival calculus covering more than 1/3,but not more than 2/3 of the exposed tooth surface. and / or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth or both
3	Supragingival calculus covering more than 2/3 of the exposed tooth surface. and/or a continuos heavy band of subgingival calculus around the cervical portion of the tooth or both

TABLE - 14

Scoring criteria - CPI and Loss of Attachment index

CPI index	
Score	**Criteria**
0	Healthy
1	Bleeding observed, directly or by using a mouth mirror, after probing.
2	Calculus detected during probing but all of the black band on the probe visible.
3	Pocket 4-5 mm (Gingival margin within the black band on the probe)
4	Pocket 6 mm or more (Black band on the probe not visible)
X	Excluded sextant (Less than two teeth present)
9	Not recorded.
Loss of Attachment index	
Score	**Criteria**
0	Loss of attachment 0-3 mm (CEJ not visible and CPI score 0-3)
	If the Cemento Enamel Junction (CEJ) is not visible and the CPI score is 4, or if the CEJ is visible.
1	Loss of attachment 4-5mm (CEJ within the black band).
2	Loss of attachment 6 -8 mm (CEJ between the upper limit of the black band and the 8-5 mm ring)
3	Loss of attachment 9- 12mm (CEJ between the 8.5mm and 11.5mm rings)
4	Loss of attachment 12mm or more (CEJ beyond the 11.5mm rings.
X	Excluded sextant (Less than two teeth present)
9	Not recorded (CEJ neither visible not detectable).

STATISTICAL ANALYSIS

Sample size:

Sample size estimation was done initially before the study was started. Sample size (n) derived using the following formula:

$$n = \frac{\{z_{1-\frac{\alpha}{2}}\sqrt{2p(1-p)} + z_{1-\beta}\sqrt{p_1(1-p_1)+p_2(1-p_2)}\}^2}{(p_1-p_2)^2}$$

Where

α - Significance value. (5%)

1- β - Power of the study. (90%)

p_1 - Anticipated probability of exposure for persons with the disease. (45%)

p_2 - Anticipated probability of exposure for persons without the disease. (25%)

P - $\frac{p_1 + p_2}{2}$

Analysis:

- Values were tabulated and analyzed using statistical package for social sciences (SPSS) version no: 15.
- Categorical variables between case group and control group were analyzed using Pearson's chi-square test.
- Pearson's correlation test was done to find correlation among OHI score, CPI score and LOA score.

TABLE -15
LIST OF PATIENTS IN CASE GROUP

S.N	OP No:	Age	Sex	# Dia	$ G	¥ P	* OHI	** CPI	*** LOA
1	86228	50	F	RA	P	P	2.16	3	1
2	86125	44	F	RA	P	P	2	3	1
3	51715	31	F	SS	P	P	2.48	3	1
4	46221	43	F	RA	P		3.16	3	1
5	45533	47	F	RA	P	P	0.98	4	3
6	50821	32	F	PM	P	P	0.66	4	3
7	49647	45	F	RA	P	P	4.98	3	1
8	51505	24	M	RA	P	A	1.82	1	0
9	50277	61	M	RA	P	P	5.16	4	2
10	36843	49	F	RA	A	A	0.32	0	0
11	46749	44	F	RA	P	P	0.78	4	2
12	50964	50	F	VA	P	P	2.16	4	2
13	43126	33	F	VA	P	P	1.5	3	1
14	50798	29	F	SLE	P	P	2.96	4	2
15	51415	42	F	SLE	P	P	4.32	3	1
16	51286	43	M	SS	P	P	2.32	3	1
17	48315	33	F	RA	P	P	2.32	3	1
18	49859	55	F	RA	P	A	0.98	1	0
19	47758	65	F	RA	P	P	4.48	3	1
20	48399	42	F	RA	P	P	5.16	3	1
21	56857	38	F	SSJ	P	P	2.8	4	2
22	49998	33	M	SPA	P	P	4.62	3	1
23	45123	27	M	RA	P	P	1.82	4	3
24	49025	31	F	RA	P	P	2.14	4	2
25	46377	39	F	RA	P	A	2.14	2	0
26	49787	40	F	RA	P	P	1.82	4	3
27	40847	35	F	RA	P	P	2.48	3	1
28	49111	24	F	SLE	P	A	2.98	2	0
29	50186	39	F	RA	P	P	2.98	4	2
30	47962	47	F	RA	P	A	2.16	2	0
31	48141	47	F	RA	P	P	2.82	4	2
32	23242	60	F	RA	P	A	0.82	2	0
33	50613	36	F	RA	P	P	3.16	3	1
34	180	58	F	SSJ	A	A	0.66	0	0
35	32815	44	F	RA	P	P	2.66	4	2
36	51281	44	F	RA	P	P	1.66	2	0
37	51678	37	F	RA	P	P	4	4	2
38	41232	28	F	SPA	P	P	2.98	4	2
39	47312	46	F	RA	P	P	2.16	4	2
40	28750	54	F	RA	P	A	1.82	2	0
41	51907	22	F	RA	P	P	1.66	4	2
42	80268	21	F	APS	P	P	1.82	4	3

S.N	OP No:	Age	Sex	# Dia	$ G	¥ P	* OHI	** CPI	*** LOA
43	45984	36	F	RA	P	P	2.82	4	2
44	51526	35	F	SSJ	P	P	1.98	4	3
45	42770	45	F	RA	P	P	2.82	4	2
46	47703	28	F	RA	P	P	0.74	3	2
47	40202	65	M	SSJ	P	P	1.16	4	2
48	41225	15	F	SS	P	P	2.16	4	2
49	49878	61	F	SSJ	P	P	1.5	4	2
50	51708	49	M	SPA	P	P	2.48	4	2
51	44317	38	M	SS	P	P	1.66	4	2
52	51702	36	F	RA	P	P	1.82	4	2
53	39468	56	M	RA	P	P	1.98	4	2
54	41643	55	M	RA	P	P	1.82	4	2
55	51261	29	F	SLE	P	P	2.32	4	2
56	52621	36	F	SLE	P	P	2.16	4	2
57	51752	48	F	RA	P	P	2.32	4	2
58	51508	19	M	SPA	P	P	2.14	4	2
59	43621	47	F	RA	P	P	1.5	4	2
60	50162	30	F	RA	P	P	3	4	2
61	49288	39	F	SS	P	P	2.82	4	2
62	51438	37	M	RA	P	P	1.82	4	2
63	51299	55	M	RA	P	P	1.98	4	3
64	46696	35	F	SLE	P	P	2.5	4	2
65	47670	34	M	SPA	P	P	0.66	4	3
66	50919	44	M	RA	P	P	2.82	4	2
67	51749	47	F	RA	P	P	3.32	4	2
68	51602	50	F	SS	P	P	1.32	4	3
69	41325	25	M	SPA	P	P	2.5	4	2
70	47043	47	F	RA	P	P	1.98	4	2
71	51878	44	F	RA	P	A	1.66	2	0
72	46651	42	F	DM	P	A	2.14	2	0
73	51930	40	F	SS	P	P	1.98	4	3
74	51816	38	F	RA	P	P	0.64	4	2
75	48176	21	F	SS	P	P	1.48	4	2
76	47033	37	F	RA	P	P	1.5	4	2
77	47627	47	F	RA	P	P	1.32	4	2
78	50693	30	F	SLE	P	P	2.32	4	2
79	50547	25	F	SLE	P	P	1.66	4	2
80	45904	20	F	SLE	P	P	1.82	4	3
81	47612	42	F	SLE	P	P	1.98	4	2
82	49598	40	F	SLE	P	P	3.32	4	2
83	51630	27	F	SLE	P	P	2.84	3	1
84	45302	27	F	SLE	P	P	3.02	4	2

S.N	OP No:	Age	Sex	# Dia	$ G	¥ P	* OHI	** CPI	*** LOA
85	49810	37	F	SLE	P	P	2.32	4	2
86	48754	24	F	SLE	P	P	2.32	3	2
87	57681	19	F	SLE	P	P	3.48	4	2
88	44263	35	F	SLE	P	P	2.5	4	2
89	50508	19	F	SLE	P	P	2.48	4	3
90	47497	21	F	SLE	P	P	2.16	4	2
91	45227	39	F	SLE	P	P	1.98	2	0
92	48163	23	F	SLE	P	P	3.64	4	2
93	51278	30	F	SLE	P	P	2.5	4	2
94	50415	53	M	SPA	P	P	3.16	3	1
95	51646	35	F	PM	P	P	1.98	4	2
96	38780	65	F	SS	P	P	2.98	4	3
97	45611	35	F	RA	P	A	2.14	2	0
98	49441	19	M	SPA	P	P	2.96	4	2
99	40764	39	F	RA	P	P	2.98	3	1
100	51818	56	F	RA	P	P	2.32	4	2
101	49484	47	M	RA	P	P	3	4	2
102	48634	32	M	SS	P	P	2.82	4	2
103	51109	32	M	SPA	P	P	2.82	4	3
104	51447	48	F	PM	P	A	1.98	2	0
105	50877	38	F	SPA	P	P	3.48	4	2
106	40072	26	F	SLE	P	P	2.66	4	3
107	45795	31	F	SLE	P	P	3.82	4	3
108	49961	36	F	SLE	P	P	3.49	4	3
109	50843	26	F	SLE	P	A	4.16	2	0
110	48832	21	F	SLE	P	A	3.5	2	0
111	49900	22	F	SSJ	P	P	3.33	4	3
112	47643	21	F	SLE	P	P	3.16	4	3
113	51835	35	F	SLE	P	P	2.46	4	2
114	51166	34	F	SLE	P	P	3.32	4	2
115	47245	28	F	SLE	P	A	3.5	2	0
116	47836	25	F	SLE	P	P	3.64	4	2
117	49170	41	F	SLE	P	A	3.32	2	0
118	42698	32	F	SLE	P	P	3.5	4	2
119	51779	23	F	SLE	P	P	3.48	3	2
120	46417	35	F	SLE	P	A	2.32	2	0
121	51406	23	F	SLE	P	P	3.64	4	2
122	47403	37	F	SLE	P	P	2.66	4	2
123	46538	37	F	SLE	P	P	2.82	4	2
124	51809	37	F	SLE	P	P	2.98	4	2
125	46096	35	F	SLE	P	P	2.98	3	1
126	50607	33	F	SS	P	P	2.49	3	1
127	51365	37	F	SS	P	P	2.48	4	2
128	43686	29	F	VA	P	A	3.99	2	0
129	49114	28	F	RA	P	P	3.33	4	2
130	50933	18	M	DM	P	P	2.82	3	1

S.N	OP No:	Age	Sex	# Dia	$ G	¥ P	* OHI	** CPI	*** LOA
131	45608	53	F	VA	P	A	2.99	2	0
132	41626	26	M	RA	P	A	2.99	2	0
133	51910	25	M	SPA	P	P	2.8	4	2
134	45196	49	M	SPA	P	P	3.3	4	2
135	51933	19	M	SPA	P	A	3.46	2	0
136	51893	19	F	ASD	P	P	2.99	4	2
137	46654	40	F	RA	P	P	2.99	4	2
138	50855	50	F	RA	P	P	3.66	4	2
139	48942	45	F	RA	P	A	3.16	2	0
140	51956	42	F	RA	P	P	3.16	3	1
141	45049	40	F	RA	P	P	3.66	4	2
142	49206	44	M	SS	P	P	5	4	2
143	51082	34	M	PM	P	P	4.16	4	2
144	47597	22	M	SPA	P	A	3.33	2	0
145	51984	50	F	RA	P	A	3.16	2	0
146	48235	36	F	RA	P	P	4.83	4	2
147	48627	34	F	SS	P	P	3.66	4	2
148	48044	47	F	SS	P	P	4.66	4	2
149	50008	47	F	RA	P	P	4.66	4	2
150	50917	46	M	RA	P	A	5	2	0
151	38330	42	F	DM	P	A	3.49	2	0
152	51281	44	F	RA	P	A	4.33	2	0
153	43758	25	M	RA	P	P	4.32	4	2
154	51715	31	F	SS	P	A	3.32	2	0
155	48141	44	F	RA	P	P	3.16	4	2
156	46400	47	M	RA	P	P	4.33	4	2
157	51597	38	F	RA	P	A	3.16	2	0
158	48691	39	F	SPA	P	P	2.99	4	2
159	39390	29	M	SPA	P	P	4.49	4	2
160	46453	52	M	RA	P	A	3.33	2	0
161	46019	24	M	SPA	P	P	4.49	3	1
162	51765	47	F	RA	P	P	4.33	4	2
163	50223	65	F	RA	P	P	4.92	4	2
164	51332	22	F	RA	P	P	4	4	2
165	51937	42	F	RA	P	A	3.32	2	0
166	49341	34	F	SSJ	P	P	4.32	3	2
167	50231	47	F	SS	P	A	2.99	2	0
168	30764	39	F	RA	P	A	3.49	2	0
169	48293	51	M	VA	P	P	5	4	2
170	51660	45	M	SPA	P	P	1.66	4	2
171	50606	44	F	SLE	P	A	2.99	2	0
172	51304	29	F	SLE	P	A	3.32	2	0
173	45373	35	F	SLE	P	A	4.16	2	0
174	51043	35	F	SLE	P	P	3.83	4	2
175	42083	40	F	SLE	P	A	3.83	2	0
176	41040	40	F	SLE	P	P	3.99	4	2

S.N	OP No:	Age	Sex	# Dia	$ G	¥ P	* OHI	** CPI	*** LOA
177	31476	34	F	SLE	P	P	4.66	4	2
178	40962	23	F	SLE	P	A	3.49	1	0
179	51242	35	F	SLE	P	P	4.99	4	2
180	32934	34	F	SLE	P	P	3.66	4	2
181	51148	40	F	SS	P	A	3.99	2	0
182	51219	21	M	SPA	P	A	4.99	2	0
183	46661	42	F	DM	P	P	3.5	4	2
184	51678	26	F	ASD	P	A	3.5	2	0
185	34878	47	M	SPA	P	P	3.5	4	2
186	51888	34	M	VA	P	P	4.66	4	2
187	52007	28	F	SLE	P	P	3.66	4	2
188	49992	17	F	SLE	P	A	3.99	2	0
189	44553	45	F	SLE	P	A	4.32	2	0
190	48745	25	F	SLE	P	A	3.66	2	0
191	58656	23	F	SLE	P	P	3.83	4	2
192	41235	24	F	SLE	P	P	1.66	3	1
193	44473	24	F	SLE	P	P	4.83	4	2
194	49538	22	F	SLE	P	A	3.49	2	0
195	50517	25	F	SLE	P	A	3.33	2	0
196	49142	30	F	DM	P	A	4.16	2	0
197	49759	41	F	SS	P	A	4	2	0
198	14105	40	M	SPA	P	P	3.5	4	2
199	51117	24	F	SPA	P	P	3.49	4	2
200	37723	34	F	SS	P	A	2.5	4	2
201	48570	36	M	SPA	P	A	4.83	2	0
202	51407	34	M	SPA	P	A	4	2	0
203	50952	28	M	VA	P	P	4.32	4	2
204	36233	38	F	RA	P	P	4.5	4	2
205	51847	50	F	RA	P	P	5	3	2
206	48067	45	F	RA	P	A	4.1	2	0
207	44304	38	F	DM	P	A	3.49	2	0
208	52109	35	F	RA	P	P	5	4	2
209	48136	46	M	RA	P	A	2.32	2	0
210	50952	32	M	SPA	P	P	4.49	4	2
211	50273	30	F	RA	P	P	3.83	4	2
212	52057	38	F	RA	P	P	4.66	4	2
213	49273	50	M	APS	P	P	4.83	4	2
214	50195	39	M	SPA	P	P	3.83	4	2
215	51546	45	M	RA	P	A	4.16	2	0

S.N	OP No:	Age	Sex	# Dia	$ G	¥ P	* OHI	** CPI	*** LOA
216	52138	26	F	RA	P	P	4.16	4	2
217	51731	40	F	RA	P	P	5	4	2
218	35005	31	F	RA	P	P	4.5	4	2
219	51447	32	F	RA	P	A	4.83	2	0
220	40515	55	F	SS	P	P	4.33	4	3
221	50816	33	M	SPA	P	P	4.49	4	2
222	51430	49	F	RA	P	A	4.16	2	0
223	51155	39	M	SPA	P	P	4.66	4	2
224	47986	50	M	RA	P	P	4	4	2
225	50916	48	M	SPA	P	P	3.32	4	2
226	51194	37	F	RA	P	P	5.49	4	2
227	47965	34	F	SS	P	P	4.33	4	2
228	51962	32	M	SPA	P	A	4.16	2	0
229	51457	32	F	RA	P	P	4.66	3	1
230	51591	31	M	SPA	P	A	4.33	2	0
231	48271	28	F	RA	P	P	4	3	2
232	49264	42	F	SS	P	A	4.16	2	0
233	49934	39	F	RA	P	P	4.16	4	2
234	48271	39	M	VA	P	P	3.16	3	0
235	49208	48	F	RA	P	P	4.33	3	2
236	51130	27	M	SPA	P	A	3.83	2	0
237	46792	20	F	RA	P	A	3.83	2	0
238	51286	42	M	RA	P	A	4.32	2	0
239	53516	22	F	SPA	P	P	4.66	3	2
240	48672	24	F	RA	P	A	4.49	2	0
241	48617	33	F	DM	P	P	3.99	3	2
242	51740	17	F	SS	P	P	4.16	3	2
243	49991	43	M	SPA	P	P	4.49	4	2
244	49671	49	F	SS	P	P	4.33	4	2
245	49938	30	F	SS	P	A	3.99	2	0
246	45226	32	F	SS	P	P	3.82	4	3
247	51688	37	F	MCTD	P	P	4.49	3	1
248	50819	30	F	RA	P	P	3.66	3	1
249	41481	21	F	VA	P	P	3.33	3	1
250	51010	34	F	RA	P	P	3.66	4	3
251	46169	23	M	SPA	P	P	4	3	1
252	52130	30	F	MCTD	P	P	4.32	4	2
253	58634	60	M	RA	P	P	4.66	4	2

NOTE:

 # - DIAGNOSIS
$ - GINGIVITIS
¥ - PERIODONTITIS
*** - ORAL HYGIENE INDEX SCORE**
**** - COMMUNITY PERIODONTAL INDEX SCORE**
***** - LOSS OF ATTACHMENT SCORE**
P - PRESENT
A - ABSENT

RA - RHEUMATOID ARTHRITIS
SLE - SYSTEMIC LUPUS ERYTHEMATOSUS
SSJ - SJOGRENS SYNDROME
SS - SYSTEMIC SCLEROSIS
PM - POLYMYOSITIS
DM - DERMATOMYOSITIS
SPA - SPONDYLOARTHROPATHY
VA - VASCULITIS
MCTD – MIXED CONNECTIVE TISSUE DISEASE
ASD - ADULT ONSET STILLS DISEASE
APS - ANTIPHOSPHOLIPID SYNDROME

TABLE -16
LIST OF PATIENTS IN CONTROL GROUP

S.N	OP No:	Age	Sex	$ G	¥ P	* OHI	** CPI	*** LOA
1	45918	39	M	P	A	1.66	2	0
2	45924	17	M	P	A	2.24	2	0
3	26817	47	M	P	A	5.16	2	0
4	48450	32	M	P	A	3.99	2	0
5	48854	40	F	P	A	4	2	0
6	48864	30	M	P	A	5.83	2	0
7	48835	40	M	P	A	4	2	0
8	48399	29	F	P	A	3.16	1	0
9	48901	29	M	P	P	4.16	3	1
10	48962	22	M	A	A	1.16	0	0
11	49210	15	F	P	A	3.33	2	0
12	50035	46	M	P	A	3.32	2	0
13	49486	19	M	P	A	3.16	2	0
14	41708	37	M	P	A	3.32	2	0
15	2155	52	M	P	P	3.16	3	1
16	50165	47	m	P	A	3.16	2	0
17	50041	22	M	P	A	3.66	2	0
18	50040	50	M	P	A	3.16	2	0
19	57195	16	F	P	A	3.82	2	0
20	57239	31	F	P	A	3.16	2	0
21	50250	22	M	P	A	4.16	2	0
22	57235	26	F	P	A	4.5	2	0
23	57678	19	F	P	A	3.83	2	0
24	57699	19	F	P	A	3.66	2	0
25	57867	24	M	P	A	3.5	2	0
26	57721	23	M	P	A	5.16	2	0
27	57676	19	F	P	A	5.33	2	0
28	57631	40	M	P	P	4.16	3	1
29	57782	19	M	P	A	4.33	2	0
30	57848	32	M	P	A	5.32	2	0
31	56261	34	M	P	A	4	2	0
32	52465	25	M	A	A	0.33	0	0
33	58395	41	M	P	A	4.16	2	0
34	58347	66	M	P	A	1.83	2	0
35	47776	25	M	P	A	3.83	2	0
36	53178	22	M	P	A	3.32	2	0
37	58350	23	F	A	A	0.5	0	0
38	45176	20	M	P	A	3.92	2	0
39	58348	40	F	P	A	3.83	2	0
40	58504	25	M	A	A	0.5	0	0
41	51515	24	M	P	A	5.66	2	0
42	58699	30	M	P	A	4.16	2	0

S.N	OP No:	Age	Sex	$ G	¥ P	* OHI	** CPI	*** LOA
43	59091	36	M	P	A	4.16	1	0
44	58685	45	M	P	A	3.66	1	0
45	58896	28	M	P	A	3.49	2	0
46	54596	37	M	A	A	0.5	0	0
47	53367	52	M	P	P	4.99	3	1
48	59960	58	M	P	A	4.03	1	0
49	59908	19	F	A	A	1.16	0	0
50	60000	47	F	A	P	4.19	4	2
51	59910	17	F	A	A	0.82	0	0
52	53046	23	F	P	P	5	3	1
53	60077	61	F	P	A	3.99	2	0
54	60275	37	F	P	A	3.49	1	0
55	60277	39	F	A	A	0.5	1	0
56	60374	42	F	P	P	4.66	3	1
57	60313	34	M	P	A	4.86	1	0
58	59860	49	M	P	P	5.16	3	1
59	55667	56	F	P	A	5.16	1	0
60	60683	23	F	A	A	0.83	0	0
61	60698	25	F	A	A	0.5	0	0
62	60687	21	F	P	A	3.16	1	0
63	60700	20	F	A	A	0.5	0	0
64	60976	28	F	P	A	3.49	1	0
65	61068	29	M	P	A	4.5	1	0
66	61082	65	F	P	P	4.66	3	1
67	61328	21	F	P	A	4	1	0
68	61351	16	F	A	A	0.5	0	0
69	45168	46	F	P	A	4.16	2	0
70	61544	65	F	P	P	4.82	3	1
71	62229	22	F	P	A	3.99	1	0
72	62296	50	M	P	P	4.32	3	1
73	62650	23	F	P	A	3.83	1	0
74	64756	41	F	P	A	3.32	1	0
75	66684	36	F	P	A	3.16	1	0
76	66701	26	F	P	A	3.83	1	0
77	67246	38	M	P	A	3.99	1	0
78	66446	54	F	P	A	4.66	3	1
79	67269	52	M	P	A	3.83	1	0
80	67257	43	M	P	A	3.49	3	1
81	62288	40	F	P	P	3.82	3	1
82	67736	50	M	P	P	3.5	3	1
83	67502	28	M	P	P	5.66	4	2
84	67885	27	F	P	A	3.49	2	0

S.N	OP No:	Age	Sex	$ G	¥ P	* OHI	** CPI	*** LOA
85	67706	19	F	A	A	0.5	0	0
86	67744	46	F	A	A	0.5	0	0
87	67764	32	M	P	A	4.83	1	0
88	67802	23	F	P	A	3.83	1	0
89	67843	68	F	P	P	3.66	3	1
90	68031	37	F	P	A	3.33	1	0
91	68151	40	F	P	A	3	1	0
92	68083	18	F	P	A	2.83	1	0
93	63404	42	F	P	A	3.16	1	0
94	68480	27	M	P	A	4.92	1	0
95	68479	26	M	P	A	5.33	1	0
96	68437	44	F	P	P	5.8	4	2
97	69115	29	M	P	P	4.99	3	1
98	69134	17	F	P	A	3.16	1	0
99	70499	28	f	A	A	0.46	0	0
100	70809	23	f	P	A	3.49	1	0
101	67242	27	F	P	A	2.66	1	0
102	77697	36	F	P	A	4.53	1	0
103	77701	18	F	P	A	4.33	1	0
104	77691	42	M	P	A	4.53	2	0
105	77777	24	M	P	A	2.99	1	0
106	77770	55	M	P	P	5	3	1
107	78025	46	M	P	P	5.16	3	1
108	73604	21	F	P	A	3.16	1	0
109	78119	17	F	P	A	2.83	1	0
110	78098	21	F	P	A	2.33	1	0
111	78008	16	F	P	A	2.16	1	0
112	78183	48	F	P	P	5.66	3	1
113	78104	27	F	A	A	0.33	0	0
114	78343	54	F	P	A	2.6	1	0
115	74403	43	F	P	A	2.5	1	0
116	78356	35	F	P	A	3.16	1	0
117	74965	42	M	P	A	4.66	1	0
118	78477	30	F	P	A	2.49	1	0
119	78474	42	M	P	P	4.99	3	1
120	78445	31	M	P	A	4	2	0
121	78761	24	F	P	A	3	1	0
122	79504	20	F	P	A	2.33	1	0
123	70874	20	F	P	A	2.83	1	0
124	79502	26	F	P	A	3	1	0
125	79232	18	F	P	A	4.33	1	0
126	79662	55	F	P	A	1.49	1	0
127	75520	59	M	P	A	1.83	1	0
128	79737	19	F	P	A	2.83	1	0
129	79740	25	F	P	A	3	1	0
130	79744	48	F	P	A	4.83	1	0
131	79828	26	F	P	A	3.16	1	0

S.N	OP No:	Age	Sex	$ G	¥ P	* OHI	** CPI	*** LOA
132	79822	26	F	P	A	4.33	1	0
133	79814	20	F	P	A	2.5	1	0
134	75419	32	F	P	P	6.16	3	1
135	79781	26	F	P	A	2.66	1	0
136	79896	25	F	P	A	2.66	1	0
137	79654	33	F	P	A	2.83	2	0
138	80213	27	F	P	A	2.83	2	0
139	80337	27	F	P	A	2.66	2	0
140	73082	40	F	P	A	3.82	1	0
141	80224	40	F	P	P	2.66	3	1
142	47104	36	F	P	A	2.66	1	0
143	80218	30	F	P	P	5	4	2
144	80163	26	F	P	A	2.33	1	0
145	80553	41	F	P	A	2.66	1	0
146	80561	30	F	P	A	2.66	1	0
147	80506	25	F	P	A	2.33	1	0
148	80598	26	F	P	A	4.99	1	0
149	80666	32	F	P	A	5.26	1	0
150	80667	33	F	P	A	2.66	1	0
151	80691	25	F	P	A	3.99	1	0
152	80685	28	F	P	A	2.5	1	0
153	80785	26	F	P	A	2.5	2	1
154	81066	36	F	P	A	2.33	1	0
155	81040	25	F	P	A	2.66	1	0
156	81062	30	F	P	P	2.83	3	1
157	81075	25	F	P	A	4.66	1	0
158	81259	34	F	P	A	3.19	1	0
159	81604	26	F	P	A	2.99	1	0
160	81732	40	F	P	P	3.83	3	1
161	80887	38	F	P	P	5.66	3	1
162	82307	35	F	A	A	0.66	0	0
163	80993	35	F	P	A	2.66	1	0
164	74917	42	F	P	A	2.33	1	0
165	82281	28	F	P	A	2.5	1	0
166	82447	47	F	P	A	3.99	1	0
167	82437	32	F	P	A	2.5	1	0
168	82438	31	F	P	A	2.5	1	0
169	82432	25	F	P	A	2.66	1	0
170	80272	45	F	P	P	5.16	3	2
171	82458	32	F	P	A	3.16	1	0
172	82484	32	F	P	A	3.32	1	0
173	76529	50	F	A	A	0.5	0	0
174	82368	32	F	P	A	4.32	1	0
175	82879	25	F	P	A	2.33	1	0
176	82964	39	F	A	A	0.66	0	0
177	82935	45	F	A	A	0.49	0	0
178	76816	43	F	A	A	0.83	0	0

S.N	OP No:	Age	Sex	$ G	¥ P	* OHI	** CPI	*** LOA
179	82970	40	F	A	A	0.83	0	0
180	77091	25	F	P	A	2.82	1	0
181	83015	48	F	P	A	5.16	1	0
182	83012	27	F	P	A	2.5	1	0
183	83000	47	F	P	A	4.83	1	0
184	83020	35	F	P	A	2.33	1	0
185	83051	25	F	P	A	2.83	1	0
186	83072	42	F	P	A	2.5	1	0
187	83159	33	F	P	A	4.49	1	0
188	84207	35	F	A	A	0.83	0	0
189	80262	37	F	A	A	0.66	0	0
190	84228	52	F	A	A	0.66	0	0
191	84241	33	F	P	A	2.66	1	0
192	82081	54	M	P	P	2.66	3	1
193	82680	42	F	A	A	0.49	0	0
194	86392	41	F	A	A	0.33	0	0
195	68903	39	F	P	P	5.03	4	2
196	82623	48	F	A	A	0.16	0	0
197	86752	28	F	P	P	2.5	3	1
198	86800	25	F	P	A	2.03	1	0
199	86701	47	F	A	A	0.33	0	0
200	86785	38	F	A	A	0.66	0	0
201	86697	39	F	A	A	0.66	0	0
202	86696	49	F	P	A	2.32	1	0
203	86884	40	F	P	A	2.19	1	0
204	86894	42	F	P	A	3.16	1	0
205	83591	50	F	P	A	5	3	1
206	87369	36	F	A	A	0.49	0	0
207	87386	56	F	A	A	0.32	0	0
208	41418	44	F	P	A	3.33	0	0
209	84791	36	F	P	A	2.99	1	0
210	60085	44	F	P	A	2.66	1	0
211	12379	41	F	P	A	5.33	1	0
212	87735	37	F	P	A	5.66	1	0
213	86636	39	F	P	A	5.16	1	0
214	82598	35	F	P	A	4.69	1	0
215	87790	53	F	P	P	3.16	3	1
216	86766	50	F	P	P	2.36	4	2
217	87958	35	F	P	A	2.33	1	0
218	88223	31	F	P	A	4.66	1	0
219	88530	43	F	P	A	2.33	3	1
220	88580	40	F	P	A	2.49	1	0
221	87105	40	F	P	A	2.82	1	0
222	88660	50	F	P	P	3.16	3	1
223	88551	49	F	P	A	2.82	1	0
224	88738	35	F	P	A	2.66	1	0
225	88855	35	F	P	A	2.33	1	0
226	88852	35	F	A	A	0.66	0	0
227	88851	28	F	A	A	0.49	0	0
228	88959	36	F	P	A	2.19	1	0
229	85994	49	F	P	P	2.83	3	1
230	86222	36	F	P	A	2.66	1	0
231	89079	35	F	P	A	3.33	1	0
232	89077	45	F	P	P	4.66	3	1
233	89094	47	F	P	A	3.66	1	0
234	89142	36	F	P	A	2.82	1	0
235	89129	38	F	P	A	3.66	1	0
236	89160	38	F	P	A	2.66	1	0
237	89239	38	F	P	A	4.99	1	0
238	89829	35	F	P	A	2.33	1	0
239	89835	38	F	P	P	5.49	4	2
240	89956	38	F	P	A	5.49	1	0
241	89924	39	F	P	A	2.83	1	0
242	90091	50	F	P	A	3.5	1	0
243	90064	46	F	A	A	2.49	0	0
244	90115	38	F	P	P	4.32	3	1
245	86729	36	F	P	A	3.32	1	0
246	90325	50	F	P	A	1.83	1	0
247	91045	37	F	P	A	5.99	1	0
248	86232	45	F	P	A	1.82	1	0
249	86225	50	F	P	P	2.16	3	1
250	86334	43	F	P	A	3.16	1	0
251	86745	56	F	P	A	0.83	2	0
252	86453	63	F	P	A	0.83	1	0
253	87456	26	M	P	A	2.16	2	0
254	88789	27	M	P	A	2.33	2	0
255	88798	37	M	P	A	3.16	2	0
256	88978	48	M	A	A	0.49	2	0
257	88988	52	M	P	A	2.33	1	0
258	89123	55	M	P	A	1.83	1	0
259	89465	61	M	P	A	1.82	1	0
260	88789	38	M	P	A	3	1	0
261	87890	36	M	P	A	3.33	1	0
262	88788	50	M	P	A	2.16	2	0

NOTE:

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A - ABSENT

RESULTS

The distribution of patients in case group and control group with respect to age, sex and OHI was showed in **Table – 17**. None of the patients have the OHI score 8.1-12. Female patients were more than male patients in both groups. (Case group: Male - 61, Female – 192; Control group: Male - 69, Female- 193).

The distribution of patients among case group within various systemic autoimmune diseases was showed in **Table – 18.** (Rheumatoid arthritis -98, Systemic lupus erythematosus – 60, Spondyloarthropathy – 35, Systemic sclerosis - 27, Inflammatory myopathies - 11, Sjogrens syndrome, vasculitis, Mixed connective tissue disease, Antiphospholipid syndrome and adult onset stills disease – 23)

Prevalence of periodontal disease was more in case group (Gingivitis **99.2%** & Periodontitis **73.9%**) than control group (Gingivitis **85.5%** & Periodontitis **14.9%**) with $P < 0.05$. (**Table – 19, Figure – 1)**

Prevalence of periodontal disease among various systemic autoimmune diseases in case group (**Table – 20, Figure – 2)** showed Gingivitis **100%** in all systemic autoimmune diseases except in Rheumatoid arthritis – 98.9% & Sjogrens syndrome – 85.7%. Periodontitis > **70%** in all systemic

autoimmune diseases except in Inflammatory myopathies – 63.6% and Adult onset stills diseases – 50%.

Prevalence of periodontal disease in male (Gingivitis **100%** Periodontitis **75.4%**) and female (Gingivitis **99%** Periodontitis **73.4%**) patients of case group was more than male (Gingivitis 92.8% Periodontitis 18.8%) and female (Gingivitis **82.9%** Periodontitis **13.5%**) patients of control group with significant p-value. (**Table -21, Figure – 3).**

In all OHI groups prevalence of periodontitis was more in case group than control group with significant p-value ($P<0.05$). In OHI group 4.1 - 8.0 there was no statistical difference in prevalence of gingivitis between case and control group. (**Table -22, Figure -4).**

Prevalence of gingivitis was more in case group than control group in all age groups except in 55-64 years and 65-74 years with statistical difference ($P<0.05$). (**Table – 23, Figure -5).**

Prevalence of periodontitis was more in case group than control group in all age groups except in 65-74years with statistical difference ($P<0.05$). (**Table – 24, Figure -6).**

Prevalence of periodontitis was more in male and female patients of case group than control group in all OHI groups with statistical significant value (P<0.05). In the OHI group 4.1-8, prevalence of gingivitis among groups showed no statistical difference. (**Table – 25, Figure -7 & 8).**

Patients with OHI score 0-4, showed more prevalence of periodontitis in case group than control group in all age groups. except in age 65-74 years, with P<0.05. It not showed much difference for prevalence of gingivitis among groups in age groups 55-64 years, and 65-74 years. (**Table– 26, Figure -9 & 10).**

Patients with OHI score 4.1-8, showed more prevalence of periodontitis in case group than control group in age groups 15-24 years, 25-34 years and 35-44 years with P<0.05. It showed no statistical difference in prevalence of gingivitis between groups. (**Table – 27, Figure -11 & 12).**

There was no statistical difference with all OHI groups in prevalence of periodontal disease among various systemic autoimmune diseases in case group with **p-value > 0.05**. (**Table – 28 & 29).**

Higher scores of CPI and LOA were more prevalent in patients of case group than control group. Score 3 of LOA was present only in case group not in control group. (**Table – 30, Figure -13).**

Higher scores of CPI and LOA were more prevalent in all OHI groups of case group, irrespective of OHI scores. In contrast higher scores were more present only in higher OHI scores among control group and it reduced when OHI scores reduced. (**Table – 31 & 32, Figure -14 & 15).**

In case group there was **no correlation** among OHI scores, CPI scores and LOA scores with **p- value >0.01**. (**Table – 33).**

In control group there showed correlation among OHI scores, CPI scores and LOA scores with significant **p- value < 0.01**. (**Table – 34).**

TABLE – 17
Distribution of patients among case group and control group

Groups	Subgroups	Case Group		Control Group	
		Count	**%**	**Count**	**%**
Age Group	15 – 24	39	15.4	44	16.8
	25 – 34	69	27.3	73	27.9
	35 – 44	84	33.2	84	32.1
	45 – 54	46	18.2	46	17.6
	55 – 64	11	4.3	11	4.2
	65 – 74	4	1.6	4	1.5
	Total	253	100	262	100
Sex Group	Male	61	24.1	69	26.3
	Female	**192**	75.9	**193**	73.7
	Total	253	100	262	100
OHI Group	0 – 4.0	188	74.3	193	73.7
	4.1 – 8.0	65	25.7	69	26.3
	8.1 – 12.0	**0**	**0**	**0**	**0**
	Total	253	100	262	100

TABLE – 18

Distribution of patients with various systemic autoimmune diseases among case group

Systemic autoimmune diseases	Case Group	
	Count	**%**
Rheumatoid arthritis	**98**	38.7
Systemic lupus erythematosus	**60**	23.7
Systemic sclerosis	**27**	10.7
Sjogrens syndrome	7	2.8
Vasculitis	9	3.6
Inflammatory myopathies	11	4.3
Spondyloarthropathy	**35**	13.8
Mixed connective tissue disease	2	0.8
Antiphospholipid syndrome	2	0.8
Adult onset still’s disease	2	0.8

TABLE – 19

Comparison of periodontal disease prevalence among case group and control group

Periodontal disease		Case Group		Control Group		Chi-value	P-value
		Count	%	Count	%		
Gingivitis	Present	251	99.2	224	85.5	33.788	**0.000****
	Absent	2	0.8	38	14.5		
	Total	253	100	262	100		
Periodontitis	Present	187	73.9	39	14.9	182.109	**0.000****
	Absent	66	26.1	223	85.1		
	Total	253	100	262	100		

Note : ** - Highly significant

FIGURE – 1

Comparison of periodontal disease prevalence among case group and control group

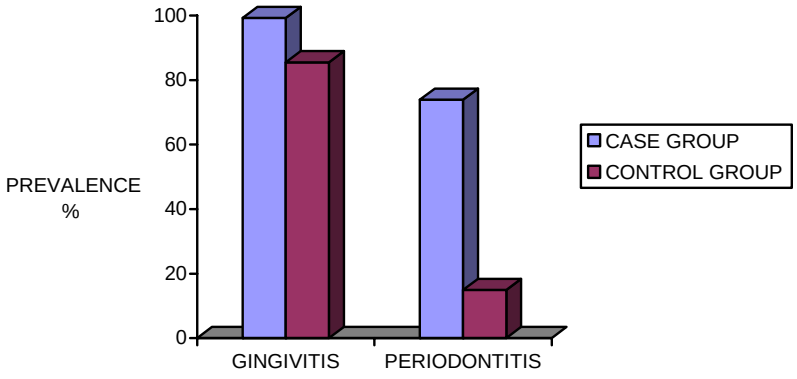


TABLE – 20
Prevalence of periodontal disease among various systemic autoimmune diseases within case group

S.no	Systemic autoimmune diseases	Total cases	Prevalence of periodontal diseases			
			Gingivitis		Periodontitis	
			Counts	%	Counts	%
1	Rheumatoid arthritis	98	97	98.9	73	74.5
2	Systemic lupus erythematosus	60	60	100	44	73.3
3	Systemic sclerosis	27	27	100	20	74.1
4	Sjogrens syndrome	7	6	85.7	6	85.7
5	Vasculitis	9	9	100	7	77.8
6	Inflammatory myopathies	11	11	100	7	63.6
7	Spondyloarthropathy	35	35	100	27	77.1
8	Mixed connective tissue disease	2	2	100	2	100
9	Antiphospholipid syndrome	2	2	100	2	100
10	Adult onset still's disease	2	2	100	1	50

FIGURE -2
Prevalence of periodontal disease among various systemic autoimmune diseases within case group

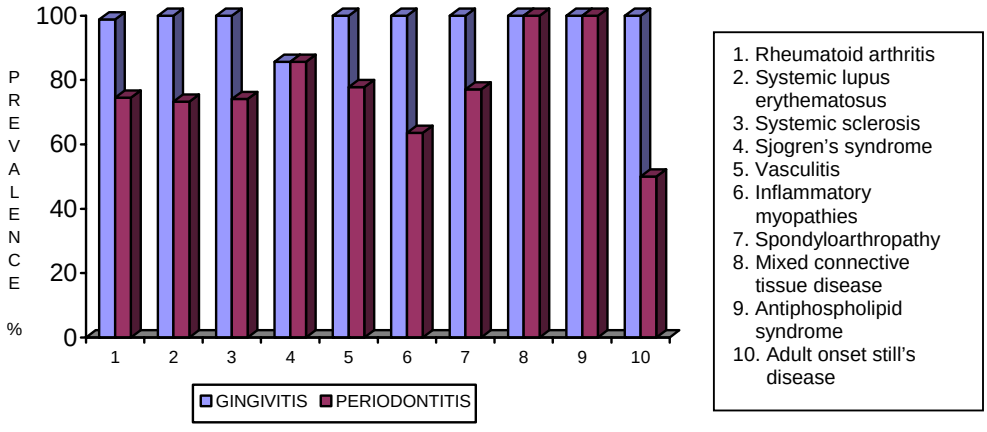


TABLE – 21

Comparison of periodontal disease prevalence among case group and control group within sex subgroup

Periodontal disease	Sex Group		Case Group		Control Group		Chi – Value	P – Value
			Count	%	Count	%		
Gingivitis	Male	Present	61	**100**	64	**92.8**	4.597	**0.032***
		Total	61	100	69	100		
	Female	Present	190	**99**	160	**82.9**	30.026	**0.000****
		Total	192	100	193	100		
Periodontitis	Male	Present	46	**75.4**	13	**18.8**	41.800	**0.000****
		Total	61	100	69	100		
	Female	Present	141	**73.4**	26	**13.5**	140.915	**0.000****
		Total	192	100	193	100		

Note : * * - Highly significant; * - Significant

FIGURE – 3

Comparison of periodontal disease prevalence among case group and control group within sex subgroup

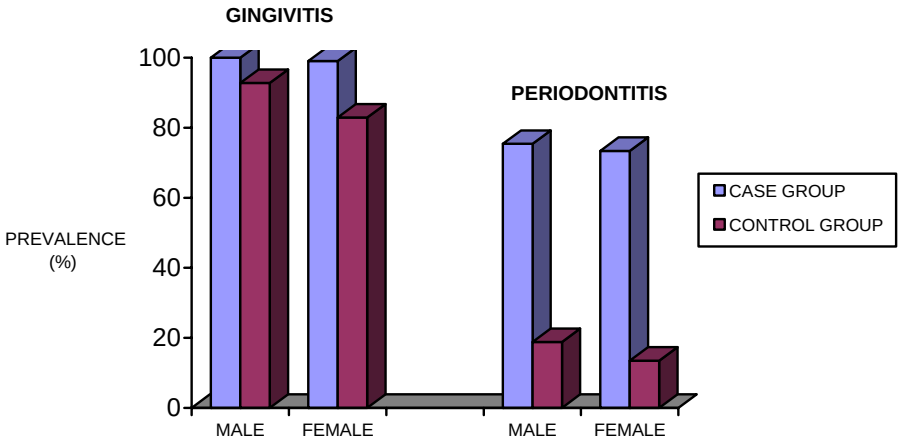


TABLE – 22

Comparison of periodontal disease prevalence among case group and control group within OHI subgroups

Periodontal disease	OHI group		Case Group		Control Group		Chi - Value	P – Value
			Count	%	Count	%		
Gingivitis	0 – 4.0	Present	186	**98.9**	156	**80.8**	33.982	**0.000****
		Total	188	100	193	100		
	4.1 – 8	Present	65	100	68	98.6	0.949	0.330$
		Total	65	100	69	100		
	8.1 - 12	Total	0	0	0	0	-	-
Periodontitis	0 – 4.0	Present	139	**73.9**	14	**7.3**	176.212	**0.000****
		Total	188	100	193	100		
	4.1 – 8	Present	48	**73.8**	25	**36.2**	19.095	**0.000****
		Total	65	100	69	100		
	8.1 - 12	Total	0	0	0	0	-	-

Note : * * - Highly significant; $ - Not significant

FIGURE – 4

Comparison of periodontal disease prevalence among case group and control group within OHI subgroups

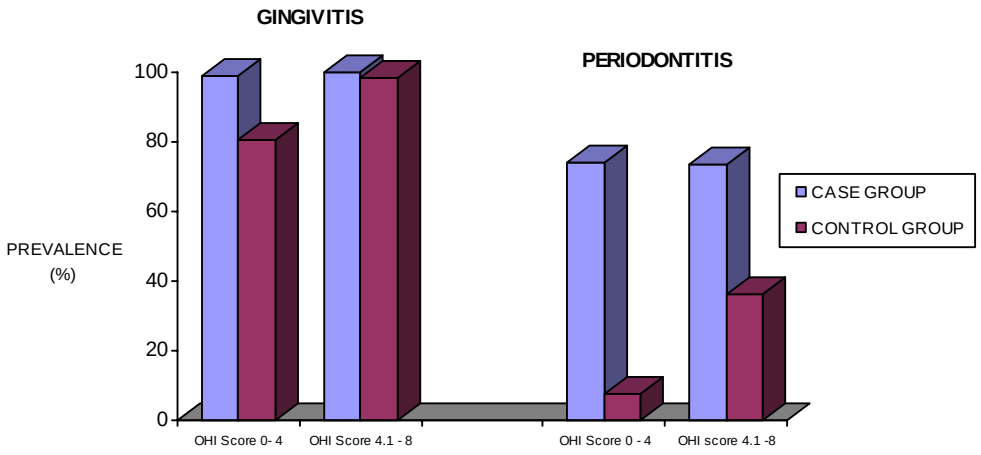


TABLE – 23

Comparison of gingivitis prevalence among case group and control group within age group

Age Group		Case Group		Control Group		Chi – Value	P - Value
		Count	%	Count	%		
15 – 24	Present	39	**100**	36	**81.8**	7.847	**0.005****
	Total	39	100	44	100		
25 – 34	Present	69	**100**	67	**91.8**	5.921	**0.015***
	Total	69	100	73	100		
35 – 44	Present	84	**100**	70	**83.3**	15.273	**0.000****
	Total	84	100	84	100		
45 – 54	Present	45	**97.8**	37	**80.4**	7.180	**0.007****
	Total	46	100	46	100		
55 – 64	Present	10	90.9	10	90.9	0.000	1.000$
	Total	11	100	11	100		
65 - 74	Present	4	100	4	100	-	-
	Total	4	100	4	100		

Note : * * - Highly significant; * - Significant; $ - Not significant

FIGURE – 5

Comparison of gingivitis prevalence among case group and control group within age group

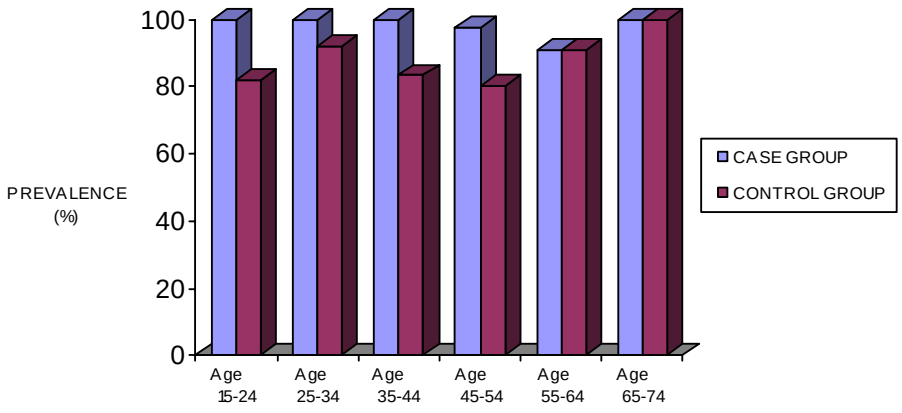


TABLE – 24

Comparison of periodontitis prevalence among case group and control group within age group

Age Group		Case Group		Control Group		Chi – Value	P – Value
		Count	%	Count	%		
15 – 24	Present	28	**71.8**	1	**2.3**	43.959	**0.000****
	Total	39	100	44	100		
25 – 34	Present	52	**75.4**	7	**9.6**	63.187	**0.000****
	Total	69	100	73	100		
35 – 44	Present	64	**76.2**	11	**13.1**	67.658	**0.000****
	Total	84	100	84	100		
45 – 54	Present	31	**67.4**	16	**34.8**	9.787	**0.002****
	Total	46	100	46	100		
55 – 64	Present	8	**72.7**	1	**9.1**	9.214	**0.002****
	Total	11	100	11	100		
65 – 74	Present	4	100	3	75	1.143	0.285$
	Total	4	100	4	100		

Note : * * - Highly significant; $ - Not significant

FIGURE – 6

Comparison of periodontitis prevalence among case group and control group within age group

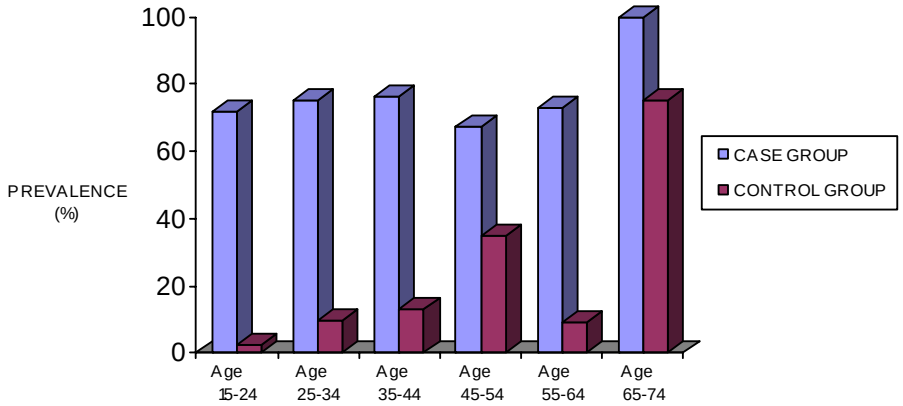


TABLE – 25

Comparison of periodontal disease in patients among case group and control group within OHI and sex group

Periodontal disease	OHI Group	Sex Group	Total Count		Prevalence of periodontal disease				Chi - Value	P – Value
			Cases	Controls	Case Group		Control Group			
					Count	%	Count	%		
Gingivtis	0 – 4.0	Male	37	41	37	100	36	87.8	4.821	**0.028***
		Female	151	152	149	**98.7**	120	**78.9**	29.594	**0.000****
	4.1 – 8.0	Male	24	28	24	100	28	100	-	-
		Female	41	41	41	100	40	97.6	1.012	0.314$^{\$}$
Periodontitis	0 – 4.0	Male	37	41	29	**78.4**	3	**7.3**	40.592	**0.000****
		Female	151	152	110	**72.8**	11	**7.2**	135.943	**0.000****
	4.1 – 8.0	Male	24	28	17	**70.8**	10	**35.7**	6.385	**0.012***
		Female	41	41	31	**75.6**	15	**36.6**	12.676	**0.000****

Note : * * - Highly significant; * - Significant; $ - Not significant

FIGURE – 7

Comparison of gingivitis prevalence among case group and control group within OHI and sex group

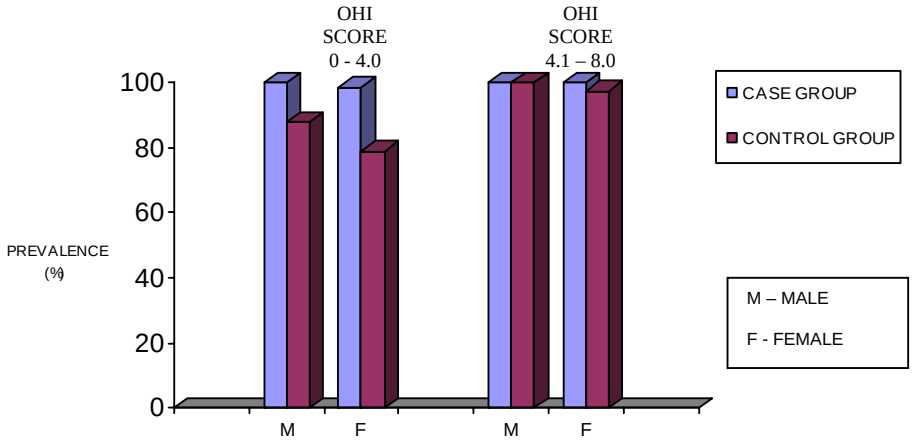


FIGURE – 8

Comparison of periodontitis prevalence among case group and control group within OHI and sex group

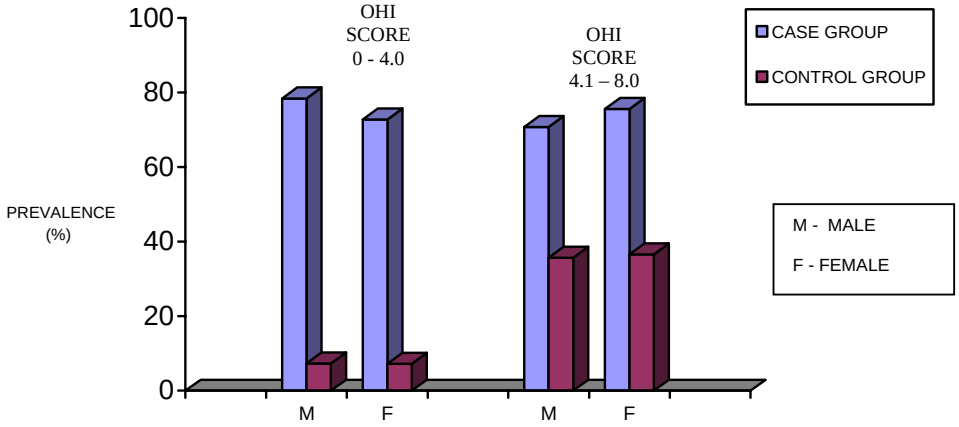


TABLE – 26

Comparison of periodontal disease in patients among case group and control group within OHI group (OHI Score 0 - 4.0) and age group

Periodontal disease	Age Group	Total Count		Prevalence of periodontal disease				Chi - Value	P – Value
		Cases	Controls	Case Group		Control Group			
				Count	%	Count	%		
Gingivitis	15 – 24	33	36	33	**100**	28	**77.8**	8.295	**0.004****
	25 – 34	49	52	49	**100**	46	**88.5**	6.011	**0.014***
	35 – 44	65	64	65	**100**	50	**78.1**	15.950	**0.000****
	45 – 54	31	31	30	**96.8**	23	**74.2**	6.369	**0.012***
	55 - 64	8	8	7	87.5	7	87.5	0.000	1.000$
	65 - 74	2	2	2	100	1	100	-	-
Periodontitis	15 – 24	33	36	24	**72.7**	0	**0**	40.145	**0.000****
	25 – 34	49	52	37	**75.5**	2	**3.8**	54.660	**0.000****
	35 – 44	65	64	50	**76.9**	3	**4.7**	69.518	**0.000****
	45 – 54	31	31	21	**67.7**	8	**25.8**	10.949	**0.001****
	55 - 64	8	8	5	**62.5**	0	**0**	7.273	**0.007****
	65 - 74	2	2	2	100	1	50	1.333	0.248$

Note : * * - Highly significant; * - Significant; $ - Not significan

FIGURE – 9

Comparison of gingivitis prevalence among case group and control group within OHI group (OHI Score 0 - 4.0) and age group

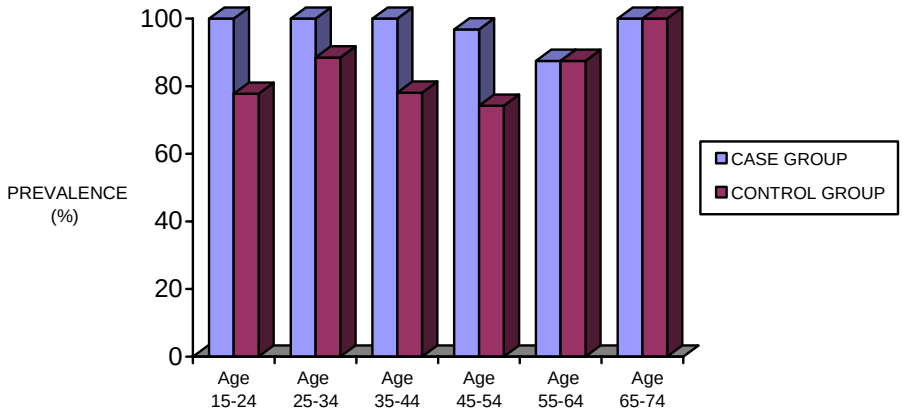


FIGURE – 10

Comparison of periodontitis prevalence among case group and control within OHI group (OHI Score 0 - 4.0) and age group

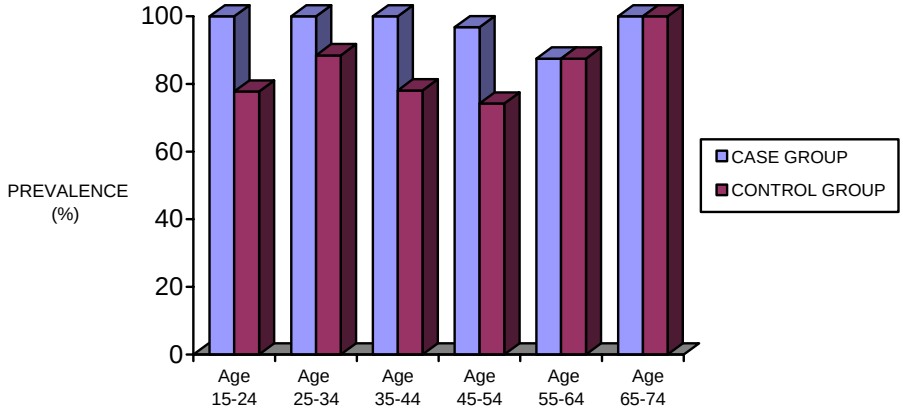


TABLE – 27

Comparison of periodontal disease in patients among case group and control group within OHI group (OHI Score 4.1 – 8.0) and age group

Periodontal disease	Age Group	Total Count		Prevalence of periodontal disease				Chi - Value	P – Value
		Cases	Controls	Case Group		Control Group			
				Count	%	Count	%		
Gingivitis	15 - 24	6	8	6	100	8	100	-	-
	25 – 34	20	21	20	100	21	100	-	-
	35 – 44	19	20	19	100	20	100	-	-
	45 – 54	15	15	15	100	14	93.3	1.034	0.309$^{\$}$
	55 - 64	3	3	3	100	3	100	-	-
	65 – 74	2	2	2	100	2	100	-	-
Periodontitis	15 – 24	6	8	4	**66.7**	1	**12.5**	4.381	**0.036***
	25 – 34	20	21	15	**75**	5	**23.8**	10.744	**0.001****
	35 – 44	19	20	14	**73.7**	8	**40**	4.496	**0.034***
	45 – 54	15	15	10	66.7	8	53.3	0.556	0.456$^{\$}$
	55 – 64	3	3	3	100	1	33.3	3.000	0.083$^{\$}$
	65 - 74	2	2	2	100	2	100	-	-

Note : * * - Highly significant; * - Significant; $ - Not significant

FIGURE – 11

Comparison of gingivitis prevalence among case group and control group within OHI group (OHI Score 4.1 – 8.0) and age group

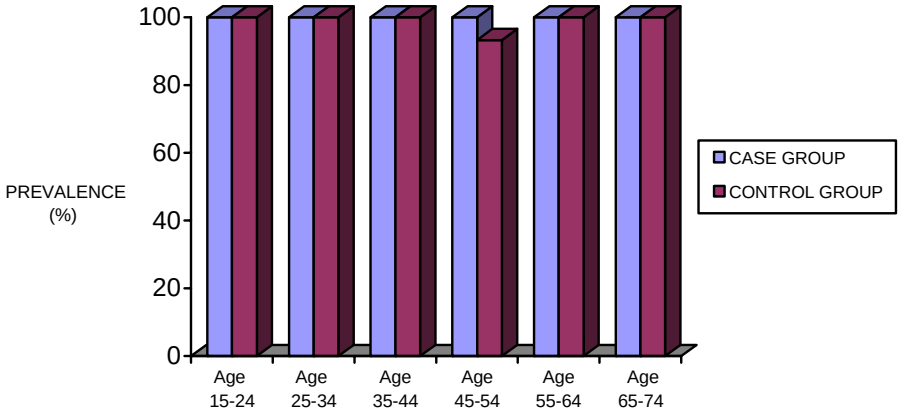


FIGURE – 12

Comparison of periodontitis prevalence among case group and control within OHI group (OHI Score 4.1 – 8.0) and age group

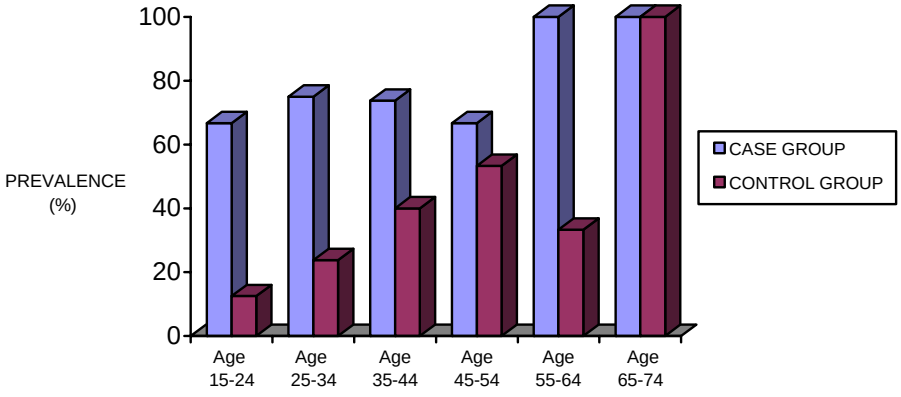


TABLE – 28

Comparison of gingivitis prevalence among various autoimmune diseases in case group within OHI group

Systemic autoimmune diseases	Total count in OHI group		Prevalence of gingivitis in OHI group				Chi - Value	P – Value
	OHI Score 0-4	OHI Score 4.1-8	OHI Score 0-4		OHI Score 4.1-8			
			Count	%	Count	%		
Rheumatoid arthritis	68	30	67	98.5	30	100	0.446	**0.504**$^{\$}$
Systemic lupus erythematosus	53	7	1	1.5	7	100	-	-
Systemic sclerosis	20	7	20	100	7	100	-	-
Sjogrens syndrome	6	1	5	83.3	1	100	0.194	**0.659**$^{\$}$
Vasculitis	6	3	6	100	3	100	-	-
Inflammatory myopathies	9	2	9	100	2	100	-	-
Spondyloarthropathy	23	12	23	100	12	100	-	-
Mixed connective tissue disease	0	2	-	-	2	100	-	-
Antiphospholipid syndrome	1	1	1	100	1	100	-	-
Adult onset still's disease	2	0	2	100	-	-	-	-

Note : $ - Not significant

TABLE – 29

Comparison of periodontitis prevalence among various autoimmune diseases in case group within OHI group

Systemic autoimmune diseases	Total count in OHI group		Prevalence of periodontitis in OHI group				Chi – Value	P – Value
	OHI score 0-4	OHI score 4.1-8	OHI score 0-4		OHI score 4.1-8			
			Count	%	Count	%		
Rheumatoid arthritis	68	30	50	73.5	22	73.3	0.000	**0.984**$
Systemic lupus erythematosus	53	7	40	75.5	4	57.1	1.062	**0.303**$
Systemic sclerosis	20	7	14	70	6	85.7	0.667	**0.414**$
Sjogrens syndrome	6	1	5	83.3	1	100	0.194	**0.659**$
Vasculitis	6	3	4	66.7	3	100	1.286	**0.257**$
Inflammatory mkyopathies	9	2	5	55.6	1	50	0.020	**0.887**$
Spondyloarthropathy	23	12	19	82.6	8	66.7	1.137	**0.286**$
Mixed connective tissue disease	0	2	-	-	2	100	-	-
Antiphospholipid syndrome	1	1	1	100	1	100	-	-
Adult onset still's disease	2	-	1	50	-	-	-	-

Note : $ - Not significant

TABLE – 30

Comparison of CPI score and LOA score among case group and control group

	Score	Case Group		Control Group		Chi - Value	P – Value
		Count	%	Count	%		
CPI Score	0	2	0.8	36	13.7	30.421	0.000**
	1	3	1.2	133	50.8	124.265	0.000**
	2	62	24.5	50	19.1	1.286	0.257$
	3	39	15.4	36	13.7	0.120	0.729$
	4	147	**58.1**	7	**2.7**	127.273	0.000**
Total		253	100	262	100		
LOA Score	0	68	26.9	218	83.2	78.671	0.000**
	1	28	11.1	36	13.7	1.000	0.317$
	2	135	53.4	8	3.1	112.790	0.000**
	3	22	**8.7**	0	**0**	-	-
	4	0	0	0	0	-	-
Total		253	100	262	100		

Note : * * - Highly significant; $ - Not significant

FIGURE – 13

Comparison of CPI score and LOA score among case group and control group

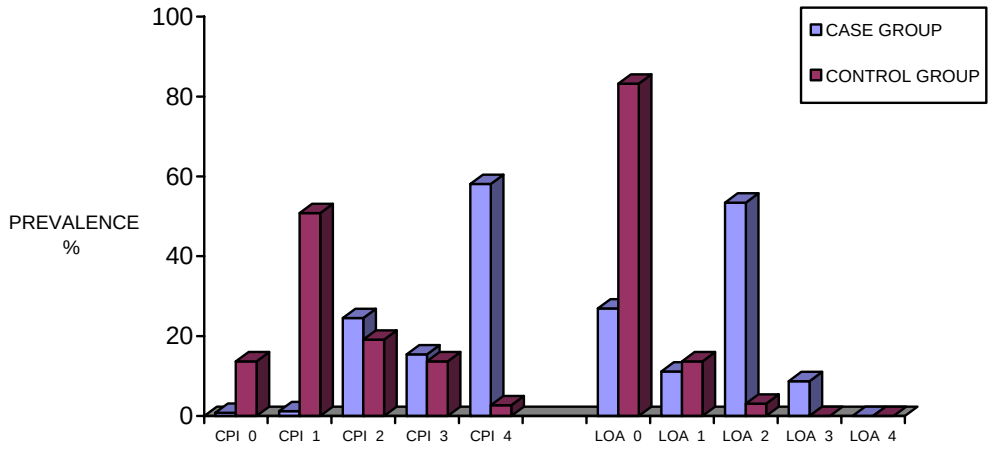


TABLE -31

Comparison of CPI score among case group and control group within OHI group

OHI Score	CPI Score	Case Group		Control Group		Chi - Value	P – Value
		Count	%	Count	%		
OHI score 0-4	0	2	4.5	34	73.9	66.433	0.000**
	1	2	4.5	8	17.4		
	2	6	13.6	4	8.7		
	3	4	9.1	0	0		
	4	30	**68.2**	0	**0**		
Total		44	100	46	100		
OHI score 4.1-8.0	0	0	0	0	0	51.855	0.000**
	1	0	0	29	42		
	2	17	26.2	13	18.8		
	3	13	20	21	30.4		
	4	35	**53.8**	6	**8.7**		
Total		65	100	69	100		

Note : * * - Highly significant;

FIGURE -14

Comparison of CPI score among case group and control group within OHI group

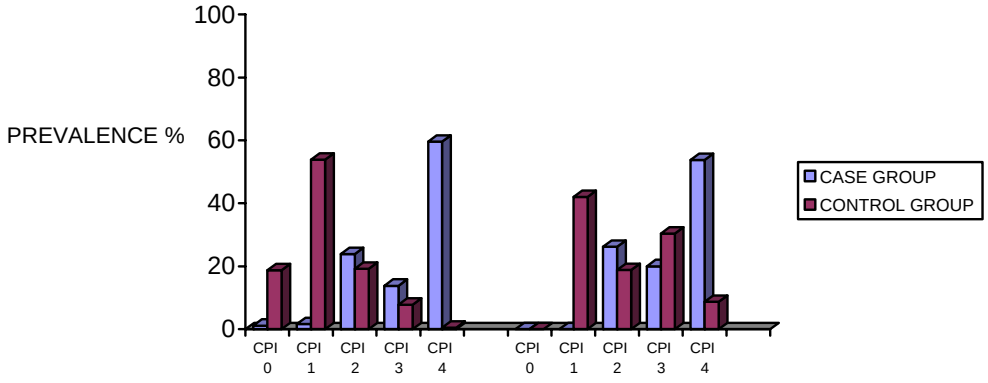


TABLE -32

Comparison of LOA score among case group and control group within OHI group

OHI Score	LOA Score	Case Group		Control Group		Chi - Value	P – Value
		Count	%	Count	%		
OHI score 0-4	0	51	27.1	176	91.2	183.284	0.000**
	1	20	10.6	16	8.3		
	2	96	51.1	1	0.5		
	3	21	**11.2**	0	**0**		
	4	0	0	0	0		
Total		188	100	193	100		
OHI score 4.1-8.0	0	17	26.2	42	60.9	38.912	0.000**
	1	8	12.3	20	29		
	2	39	60	7	10.1		
	3	1	**1.5**	0	**0**		
	4	0	0	0	0		
Total		65	100	69	100		

Note : * * - Highly significant;

FIGURE -15
Comparison of LOA score among case group and control group within OHI group

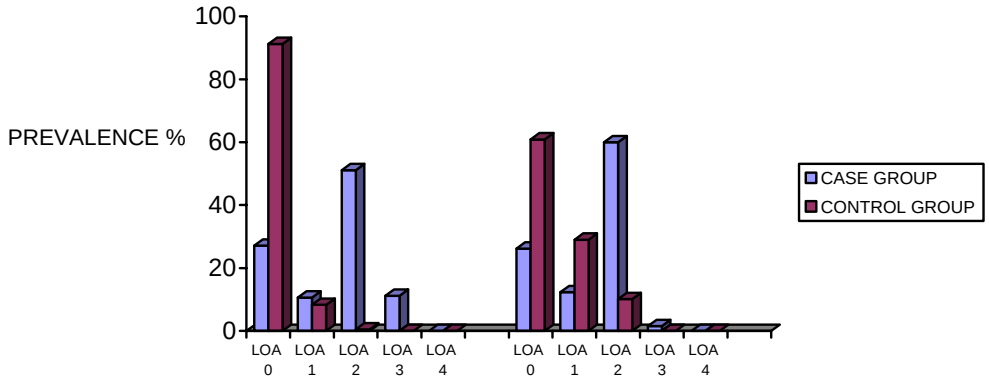


TABLE – 33

Correlation among OHI score, CPI score and LOA score among case group

		OHI score	CPI score	LOA score
OHI score	Correlation value (r)	1	-0.005	-0.100
	P-Value	-	0.936$^{\$}$	0.113$^{\$}$
CPI score	Correlation value (r)	-0.005	1	0.918
	P-Value	**0.936$^{\$}$**	-	0.000**
LOA score	Correlation value (r)	-0.100	0.918	1
	P-Value	**0.113$^{\$}$**	0.000**	-

Note : * * - Highly significant; $ - Not significant

TABLE – 34

Correlation among OHI score, CPI score and LOA score among control group

		OHI score	CPI score	LOA score
OHI score	Correlation value (r)	1	0.589	0.348
	P-Value	-	0.000**	0.000**
CPI score	Correlation value (r)	0.589	1	0.799
	P-Value	**0.000****	-	0.000**
LOA score	Correlation value (r)	0.348	0.799	1
	P-Value	**0.000****	0.000**	-

Note : * * - Highly significant;

DISCUSSION

Immune mechanism and their effects are similar for both systemic autoimmune diseases and periodontal diseases. Increased production of cytokines and abnormal immune mediated inflammatory response[12] are the pathogenic mechanism in both the condition.[7,11] They are mediated mainly by inflammatory cytokines such as IL-1, TNF and PG E2. [13]

Studies have been done to find the association between periodontal diseases and various systemic autoimmune diseases independently. There were no studies to evaluate the periodontal condition of systemic autoimmune disease as a single group. Hence this study has been done to evaluate the periodontal condition of systemic autoimmune diseases.

Rheumatoid arthritis

Studies conducted by **Eduardo de Paula Ishi et al., in 2008**[13](39 Patients), **Biyikoglu B. Buduneli et al., in 2006**[24](23 patients), **Anne Havemose-Poulsen el al., in 2006**[25] (23 patients), **and F.B.Mercado et al., in 2001**[27] (65 patients) showed positive association between periodontitis and rheumatoid arthritis in contrast with the results of the study by **Fatma Yesim Bozkurt et al in 2000**[28](15 patients). In the present study periodontal disease

prevalence (Gingivitis 98.9% & Periodontitis 74.5%) was more in rheumatoid arthritis patients than control patients irrespective of OHI scores when compared to other studies. The predominant reason might be the sample size (98 patients), In this study prevalence of periodontal diseases was assessed based on CPI with LOA and includes wide age group from 15years to 74 years. Oral hygiene scores were matched in the present study which plays major role.

Systemic lupus erythematosus

Tetsuo Kobayashi et al., in 2003[29] (60 patients) **and Ernesto Nova et al., in 1999**[30] (30 patients) showed risk of development of periodontitis in SLE patients in their study. The present study also revealed the same. Prevalence of periodontitis in SLE patients were more in the present study **(73.3%)** than by the study of Ernest Nova et al., **(60%)** but same as that of with Tetsuo Kobayashi et al **(70%**). The possible reason might be the sample size. Oral hygiene condition was not matched between case group and control group in the study by Ernest Nova et al .

Sjogrens syndrome

Studies conducted by **Kuru.B et al in 2002**[32] (8 primary & 10 secondary sjogrens syndrome patients) **and Boutsi et al in 2000**[33] (8 primary &

16 secondary sjogrens syndrome patients) showed no difference in periodontal status of sjogrens syndrome patients with healthy controls. **Jacques Olivier Pers et al., in 2005**[31] (15 primary sjogrens syndrome patients) observed that the complications of periodontitis were not attenuated in sjogrens syndrome patients. In this study among sjogrens syndrome patients prevalence of periodontal disease **(85.7%)** was more than controls irrespective of OHI scores. The difference in results might be due to sample size and also due to presence of both primary and secondary sjogrens syndrome in previous studies (except by Jacques Olivier Pers et al) which is in contrast with the present study (7 primary sjogrens syndrome). This study shows less prevalence of sjogrens syndrome in this geographic area.

Systemic sclerosis

G.A.Scardina et al., in 2005[34] showed the presence of alteration in periodontal mucosa microcirculation in 15 systemic sclerosis patients by using periodontal capillaroscopy. In the present study prevalence of periodontal disease had been observed instead of capillary alterations in systemic sclerosis patients and showed more prevalence (Gingivitis – **100%** and Periodontits – **74.1%**)

Spondyloarthropathy

N.Pischon et al., in 2010[35] reported that there was 6.81 fold increased risk of periodontal disease development in 48 ankylosing spondylitis patients. This study also showed similar results that spondyloarthropathy patients shows increased risk of periodontal disease development with prevalence of gingivitis **100%** and periodontitis **77.1%** irrespective of oral hygiene scores.

Inflammatory myopathies

Krisztina Marton et al., in 2005[36] could not demonstrated any difference in the severity of periodontal destruction between dermatomyositis patients and healthy controls while assessing for masticatory force and other orofacial abnormalities. The present study showed more prevalence of gingivitis **(100%)** and periodontitis (**63.6%**) in case group than control patients. Study by Krisztina Marton et al., observed patients who were affected with hyposalivation and also with minor salivary gland fibrosis. This may be a contributing factor in variation of results.

Antiphospholipid syndrome

Schenkein.H.A et al., in 2007[37] observed only periodontitis patients for elevated levels of inflammation markers with high anti cardiolipin

which is an antiphospholipid antibodies. It showed positive for the anti-cardiolipin antibodies. The present study showed all patients had periodontal disease but the sample size is too small. The previous study had analyzed periodontitis patients rather than antiphospholipid syndrome patients. Hence it needs further evaluation of this rare condition.

Vasculitis

Haviye Celenligil- Nazliel et al in 1999[38] evaluated periodontal status of patients with Behcet's disease which is a variant of vasculitis and showed more probing depth in them than control patients. In the present study patients with vasculitis have been evaluated for prevalence of periodontal disease (Gingivitis – **100%** and Periodontitis – **77.8%**) and found more than control subjects.

Mixed connective tissue disease

There are no studies that evaluated the periodontal status of the patients with mixed connective tissue disease without any overlapping syndrome. The present study showed periodontal prevalence in all patients with mixed connective tissue disease. It needs further evaluation due to small sample size .

Adult onset still's disease

There are no studies that evaluated the periodontal status of the patients with adult onset still's disease. In the present study periodontal status of 2 patients with adult onset still's disease have been evaluated. (Prevalence of gingivitis – **100%** and Periodontitis – **50%**). The sample size was too small which needs further evaluation in this condition about the periodontal disease development.

In this study among case group it revealed no correlation among OHI scores, CPI scores and LOA scores which was in contrast with that of control group. Highest score of CPI prevailed more in case group (Score 4 – **58.1%**) than control group (Score 4 – **2.7%**). Score 3 of LOA prevailed only in case group (8.7%). These observations denoted prevalence and severity of periodontal disease were more in case group than in control group irrespective of Oral hygiene scores.

SUMMARY AND CONCLUSION

Immune mechanism and their effects are similar for both systemic autoimmune diseases and periodontal diseases. This study has been done to evaluate the periodontal condition of systemic autoimmune diseases. 253 patients attending the Department of Rheumatology, Government General Hospital, Chennai-3 constituted the cases. 262 patients attending the Outpatient Department of Tamilnadu Government Dental College & Hospital, Chennai -3 matched for age, sex and OHI constituted the controls. Oral hygiene status and periodontal condition of both cases and controls were assessed using OHI and CPI with LOA . Values were analyzed for prevalence of periodontal disease. prevalence was more in cases (Gingivitis **99.2%** & Periodontitis **73.9%**) than in controls (Gingivitis **85.5%** & Periodontitis **14.9%**) considering for age, sex and oral hygiene status.

Oral hygiene plays an important role in development of periodontal disease but the results show that, the prevalence of periodontal disease among various systemic autoimmune diseases were irrespective of OHI scores. Patients in the case group had more probing depth as well as loss of attachment than control group.

Hence this study showed, systemic autoimmune diseases are strongly associated with periodontal disease. Conversely in patients with periodontal disease, but no oral finding, it could be advisable to check for any unidentified systemic autoimmune disease.

CASE RECORD FORM

OP.NO :

Date **:** : : 20

Name **:** Mr / Ms :

Age **:** Years

Sex **:** Male / Female

Date of birth **:**

Place of birth **:**

Address **:**

Phone **:**

Occupation **:**

Income **:** Rs. / Month

Religion **:** Hindu / Muslim / Christian / Jainism / Buddhism / Others

---

Chief complaint **:**

History of presenting illness **:**

Medical history **:**

Dental history **:**

Personal history

a) Number and age of siblings : Male :

Female :

b) Personal habits :

i) Smoking :

ii) Pan Chewing :

iii) Alcoholism :

c) Habits related to oral cavity :

i) Mouth breathing : Yes / No

ii) Thumb sucking : Yes / No

iii) Tongue thrusting : Yes / No

iv) Bruxism : Yes / No

v) Lip biting/ Nail biting/ Pencil biting : Yes / No

d) Dietary habits :

General Examination :

i) Anemia :

ii) Cyanosis :

iii) Clubbing :

iv) Jaundice :

V) Pedal edema :

Vital signs :

i) Pulse rate :

ii) Respiratory rate :

iii) Temperature :

iv) Blood pressure :

Nutritional Status :

i) Height :

ii) Weight :

iii) Body mass index (BMI) :

Local Examination :

a) Extra oral

i) Symmetry : Yes / No

ii) TMJ

1) Mouth opening :

2) Clicking sound : Present / Not present

3) Pain : Present / Not present

4) Tenderness : Present / Not present

5) Deviation : Present / Not present

iii) Lymphadenopathy :

1) Lymph glands : Palpable / Not palpable

b) Intra oral

i) Soft tissue

1) Labial mucosa :

2) Buccal mucosa :

3) Palatal mucosa :

4) Floor of the mouth :

5) Pillar of fauces :

6) Tongue :

7) Tonsils :

ii) Hard tissue

1) Maxilla :

2) Mandible :

iii) Type of dentition : Decidous / Permanent / Mixed

iv) No: of teeth present :

v) Missing teeth :

vi) Dental caries :

vii)Filled teeth :

viii) Any prosthesis : Removable / Fixed (crown / Bridge)/ Complete

ix) Wasting diseases

1) Attrition :

2) Abrasion :

3) Erosion :

x) Enamel Hypoplasia

1) Hereditary :

2) Environment : a / b / c / d / e

xi) Supernumerary teeth :

xii) Malocclusion : Angle's class I / class II / class III

xiii) Fractured teeth : Yes / No If yes , Ellis class:

xiv) Deposits :

xv) Mobility :

Gingiva

a) Colour :

b) Shape :

c) Contour :

d) Consistency :

e) Surface texture :

f) Bleeding on probing :

g) Exudate :

h) Periodontal pocket :

Provisional Diagnosis :

Investigations :

a) Models :

b) Radiographs :

c) Photographs :

d) Others :

Treatment :

I Emergency phase :

II Restorative phase :

III Therapeutic phase :

IV Preventive phase :

ORAL HYGIENE ASSESSMENT

1) ORAL HYGIENE INDEX - original : (By Greene & Vermillion in year 1960)

DEBRIS INDEX Original

	Right		Anterior		Left		Total
	Buccal	Lingual	Labial	Lingual	Buccal	Lingual	
Upper							
Lower							

Debris index = (Total of all scores)

No: of segments scored

Debris index original =

Inference =

CALCULUS INDEX - Original

	Right		Anterior		Left		Total
	Buccal	Lingual	Labial	Lingual	Buccal	Lingual	
Upper							
Lower							

Calculus index = (Total of all scores)

No: of segments scored

Calculus index original =

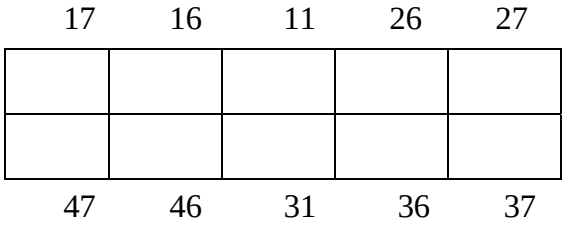
Inference =

Oral hygiene index (OHI) = Debris index + Calculus index

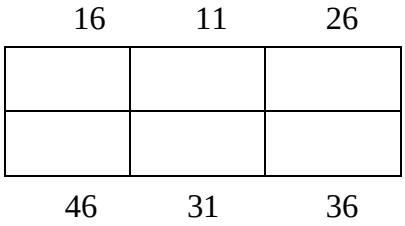
CPI AND LOSS OF ATTACHMENT INDEX

CPI index

1) For adults aged 20 years and above

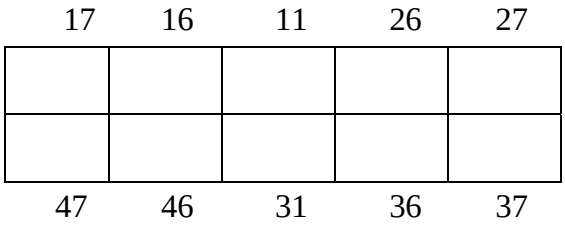


2) For subjects aged below 20 years of



Loss of attachment index

1) For adults aged 20 years and above



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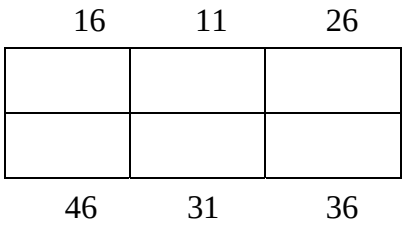

TAMILNADU GOVT. DENTAL COLLEGE & HOSPITAL
CHENNAI -3
DEPT. OF PUBLIC HEALTH DENTISTRY
INFORMED CONSENT FORM

S.NO :

STUDY TITLE:

A case control study to compare the prevalence of periodontal disease in patients with and without Systemic autoimmune diseases.

Name : Mr/Ms _____ O.P. No.:

Address: _____ SEX : Male / Female

_____ AGE : Years

_____

I, _____, exercising my free power of choice, hereby give my consent to be included as a participant in the study **.**

I agree to the following:

1. I have been informed to my satisfaction about the purpose of the study and study procedures
2. I understand that the study involves a thorough examination of my oral Cavity for oral health status.
3. I agree to co-operate fully for complete examination.
4. I agree to give blood sample or any other body fluid for investigation.
5. I agree to report to my doctor for a regular follow up as and when required For the research.
6. I have informed my doctor about all the medications that I am currently taking and other systemic illnesses that I have.
7. I hereby give permission to use my medical records for research purpose. I am told that the investigating doctor and the institution will keep my identity confidential.
8. I understand that I have rights to withdraw from the study and also that the investigator has the right to exclude me from the research at any point of time.

Name of Participant Signature/ Thumb impression Date:

S.G.Ramesh Kumar
Investigator Date:

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