

*Dept. of Public Health Dentistry*



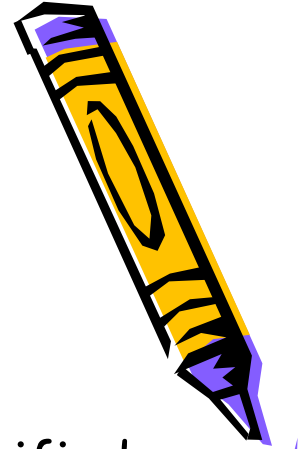
# EPIDEMIOLOGY OF PERIODONTAL DISEASE



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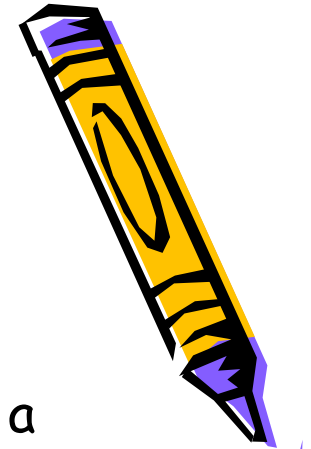
# INTRODUCTION

- Epidemiology is “the study of the distribution & determinants of health related states or events in specified populations, & the application of this study to control health problems.”
- There are 3 purposes of an epidemiologic study:
  - To determine the amount & distribution of a disease in a population.
  - To investigate causes for the disease.
  - To apply this knowledge to the control of the disease.
- The final purpose of epidemiology is to apply the knowledge gained from studies is to “promote, protect & restore health”.



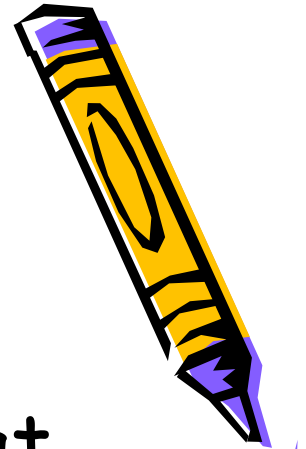
# RISK FACTORS

- **RISK**: The likelihood that a person will get a disease in a specified time period is called risk.
- For any given disease, the risk of developing a disease differs among individuals. The characteristics of individual that place them at increased risk for getting a disease are called **RISK FACTORS**.
- The process of predicting an individual's probability of disease is called **RISK ASSESSMENT**.
- Clinicians can use risk assessment to prevent disease by identifying & modifying risk factors. The amount of disease prevented depends on the success of the intervention in reducing the risk & the number of risk factors associated with the disease.



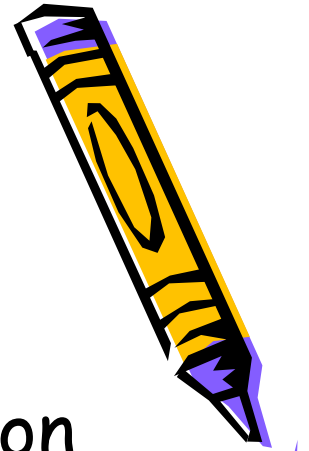
# PROGNOSTIC FACTORS

- The characteristics or factors that predict the outcome of a disease once disease is present are known as PROGNOSTIC FACTORS, & the process of using prognostic factors to predict the course of a disease is called PROGNOSIS ASSESSMENT.



# GINGIVAL DISEASE

- In simple terms, gingivitis is inflammation of gingiva. More specifically, gingivitis is inflammation of the gingiva in which the junctional epithelium remains attached to the tooth at its original level.
- Gingivitis is measured by various indices such as Gingival Index (1963, Loe H), Modified Gingival Index (1986, Lobene R R etc.) & Gingival Bleeding Indices.



# PREVALENCE OF GINGIVITIS

- Adolescents have a higher prevalence of gingivitis than prepubertal children or adults. The rise of sex hormones during adolescence affects the composition of microflora.
- There is an increased prevalence of gingivitis (30-100%) amongst pregnant women & among women using oral contraceptives.
- Males in all age groups are more likely to have gingivitis than females. The prevalence is high for males aged 13-17 years. Males with gingivitis have more involved sites than females. The reason for this is not very clear but it could be because of poor plaque control.
- Bacterial plaque is ESSENTIAL to produce gingival inflammation.
- There is a major influence of plaque control on gingivitis than the presence of rising levels of hormones.
- Increased tooth brushing frequency was associated with lower PI scores.
- Role of smoking for the presence of gingivitis is unclear. Reduction of gingival bleeding among smokers could be the result of the vasoconstrictive effects of nicotine in cigarette smoke.



# CHRONIC PERIODONTITIS

- Periodontitis is inflammation of the periodontium that extends beyond the gingiva & produces destruction of the connective tissue attachment of the teeth. It is now considered to exist in three primary forms: chronic, aggressive, & as a manifestation of systemic diseases.
- Chronic Periodontitis is the most common form. It progresses slowly & generally becomes clinically significant in adults but may be observed in children.
- It is measured by Periodontal Index (Russell A L 1954), Periodontal Disease Index ( Ramfjord SP 1959), Extent & Severity Index .
- It generally becomes clinically significant after age 30.
- It is characterized by a slow progression of attachment loss over time.
- Among adults, the prevalence of attachment loss & periodontal pockets are higher in males than females.
- The severity of Periodontitis increases with increase in age; probably because of the cumulative effect rather than an increase in amount of susceptibility.



# RISK FACTORS for periodontal disease

- the new paradigm for etiology of Periodontitis is microorganisms, but the extent & severity depends on how the host responds to the extent & virulence of the microbial burden.
- Microbial etiologic agents: *A. actinomycetomcomitans* in cases of aggressive periodontitis, *porphyromonas gingivalis* & *B forsythus* in chronic Periodontitis.
- Smokers are five times more likely than nonsmokers to develop severe Periodontitis & the risk of the disease increases with the amount of cigarettes smoked.
- Diabetes enhances an individual's susceptibility to Periodontitis. Pima Indians of Gila River Indian community in Arizona have the highest incidence of type 2 diabetes & have a three fold more likelihood of developing Periodontitis. The prevalence, severity & extent of Periodontitis are increased among poorly controlled diabetics. Well controlled diabetics have similar levels of Periodontitis as non diabetics. Diabetics treated for moderate to advanced adult Periodontitis are able to maintain healthy periodontium.



## RISK FACTORS for periodontal disease (continued)



- Nutrition: longitudinal studies do not show a direct link of minor nutritional deficiency in animal studies.
- Low socioeconomic & educational status: periodontal disease is more severe in individuals with lower socioeconomic & poor educational status.
- Osteoporosis: inconsistent results.
- HIV Infection & AIDS: they appear to elevate risk for severe Periodontitis.
- Previous periodontal disease: individuals with the most advanced existing Periodontitis are at greatest risk for future clinical attachment loss. Individuals who are currently free of Periodontitis are less likely to experience future clinical attachment loss than those with Periodontitis.
- Genetic factors: genetic factors are strongly associated with the aggressive forms and, to a lesser extent, with the chronic form.
- Stress: strong correlation of ANUG with stress.



## RISK FACTORS for periodontal disease (continued)

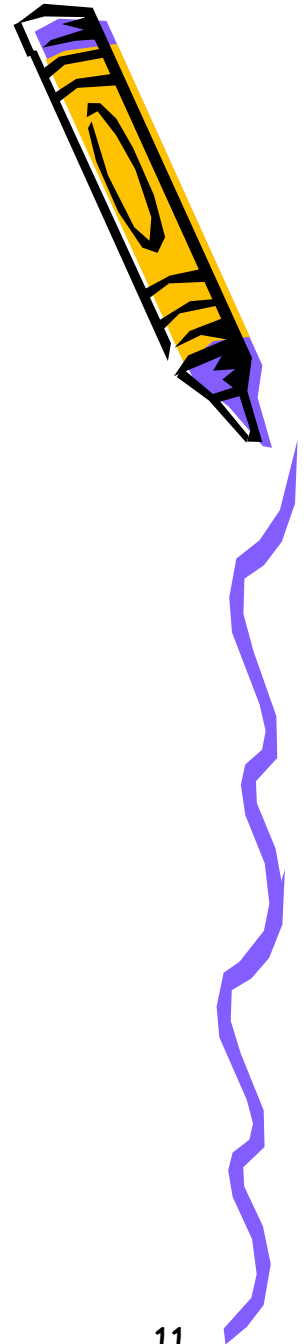


- Abnormal habits such as unilateral mastication, abnormal biting habits (opening of bobby pins, lip biting, pencil biting, etc., clenching & bruxism).
- Non-detergent diet can not only initiate caries but may aggravate or emphasize an already existing periodontal problem.
- Prolonged Mouth breathing will lead to dehydration of mucous membranes of the mouth & will lower the tissue resistance.
- Oral hygiene practices: less than 1/3rd of Indian population use a toothbrush & toothpaste; 50% are not aware of the proper brushing technique & interdental cleansing aids and mouthwashes are not widely available.
- Professional dental care: the incidence & severity of periodontal disease are lower in individuals who receive dental care.



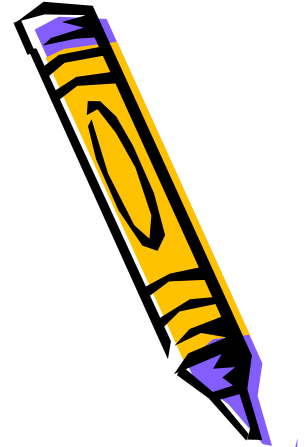
# Factors predisposing to plaque accumulation

- Inadequate oral hygiene
- Tooth malalignment
- Restorations
- Prosthesis
- Calculus



# Host factors

- Age
- Sex
- Race
- Socioeconomic status
- Intraoral variation
- Endocrine changes
- Genetic factors
- Trauma from occlusion
- Occupational habits & neurosis
- Presence of concomitant disease
- Emotional disturbance



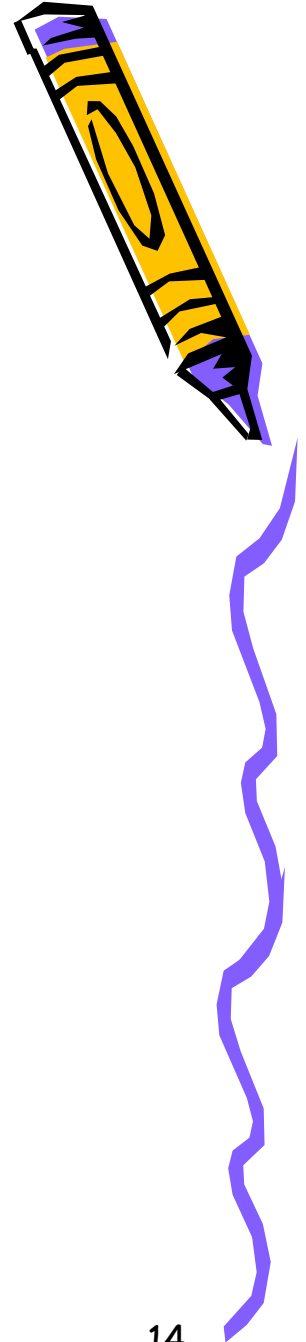
# Agent factors

- Bacteria, plaque & calculus
- Smoking & alcohol
- Systemic diseases, blood dyscrasias & chemical agents



# Environmental factors

- Degree of urbanization
- Nutrition
- Fluoride
- Educational background
- Professional dental care



# EPIDEMIOLOGICAL STUDIES ON PREVALENCE & INCIDENCE OF PERIODONTAL DISEASE:



- Studies carried out in children
- Studies carried out in handicapped children
- Studies carried out in pregnant women
- Studies carried out in adults



# 1. STUDIES CARRIED OUT IN SCHOOL CHILDREN

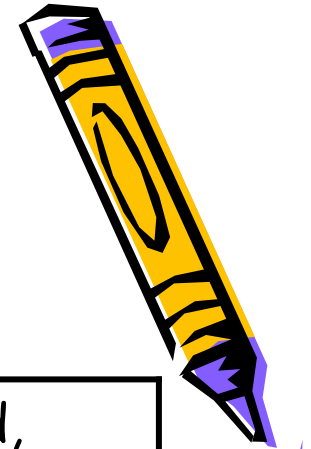


1	Nagaraj Rao	1980	500	Udupi	5-10 yrs	28% marginal gingivitis, 7.2% chronic marginal gingivitis
2	Mathur SK & Roy R K	1981	1200	Lucknow	3-14 yrs	100% gingivitis
3	Surre Auckland et al	1982	2153	Betul (MP)	6-20 yrs	poor oral hygiene status, prevalence increase with age.
4	Nagaraj Rao	1985	480	Mysore	4-14 yrs	oral hygiene better in girls than in boys.
5	Pandit K et al	1986	480	Delhi	8-18 yrs	41.7% prevalence of periodontal disease; prevalence increases with age.
6	Praveen P	1989	690	Jhansi	6-17 yrs	6-8 yrs age group: 42%; 15-17 yrs group 94.02%
7	Praveen P et al	1990	1240	Wardha	Tribals	raw food decreases the prevalence of Periodontitis.

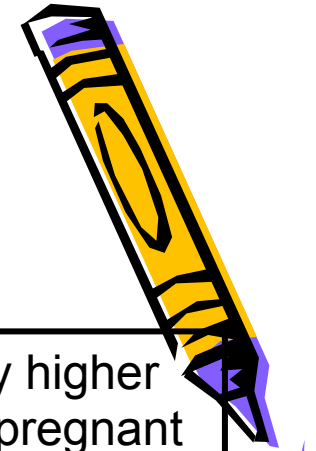


## 2. Studies carried out in Handicapped children:

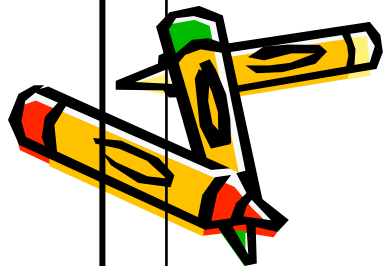
1	Mehrotra AK et al	1982	children	88.5% in handicapped, 100% in mentally retarded
2	Shobha Tandon, Sudha P	1986	8-18 yrs	poorer oral hygiene than normal kids using GI
3	MUMBAI	1991	11-14 yrs	95-100% prevalence of gingivitis



# 3. Studies carried out in Pregnant Women

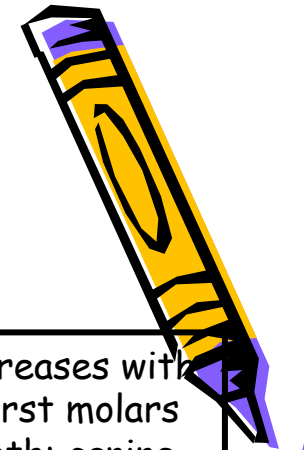


1	Dixit J et al  Uma R Samant Asha	80 pregnant & 40 non pregnant	Luckno w	20-40 yrs	1980	significantly higher severity in pregnant subjects; increase in severity in 2nd trimester.
2	Uma R				1989	severity of inflammation greatest between 2nd & 3rd trimester
3	Samant Asha	non pre 40 preg in each trimester & npreg	Chandi gadh		1976	Mean GI significantly higher in pregnant than non pregnant. Progressive increase from 1st to 3rd trimester maximum change 18 2nd trimester.



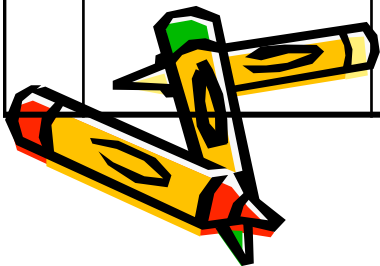
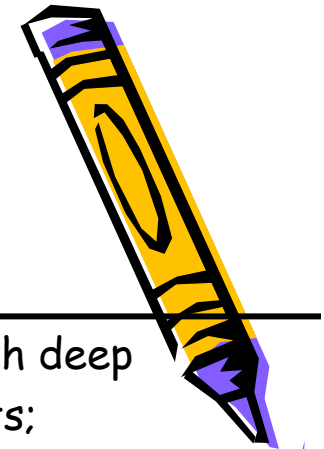
# 4. Studies carried out in Adult population

1	Singh et al	1985	141	Lucknow	15-40	prevalence of pocket increases with age; Central Incisors & first molars had maximum pocket depth; canine & premolar teeth had minimal pocket depth
2	Laveri	1986	2082	Mumbai Nair hosp	15-64	prevalence & severity of periodontal disease increased with age, among lower income group & among finger user Males were affected more than females.
3	Chattopadhyay A	1990	300 Drs, 200 dentists	Calcutta		Physicians 64% & 37.5% dentists brush once; other oral hygiene aids used by a negligible number
4	Anil S, Hari S Vijaykumar	1990	2756	Trivandrum Urban, rural	15-44	Calculus & bleeding 86% in 15-19 yrs, shallow pockets in 80% in 25-29 yrs; deep pockets >6mm in 33% of 35-44 age group

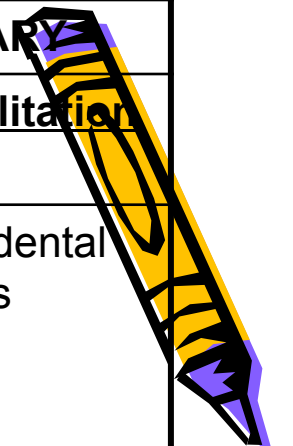
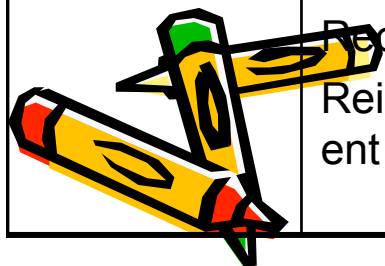


# 4. Studies carried out in Adult population

5	Maity AK, Banarjee KL, Pal TL	1994	5960	W Bengal farmers	15-65 yrs	low % of people with deep periodontal pockets; widespread calculus.
6	Maity AK, Banarjee KL, Pal TL	1994	142	Rural West Bengal	adults	64% population had calculus, Severe periodontal disease CPITN score 4 & Healthy score 0 was very less
7	Miyazki et al Miyazki & Pilot	1984-1994				Chronic inflammatory periodontal disease & their sequelae are rarely life-threatening & many other health problems are of more serious concerns.

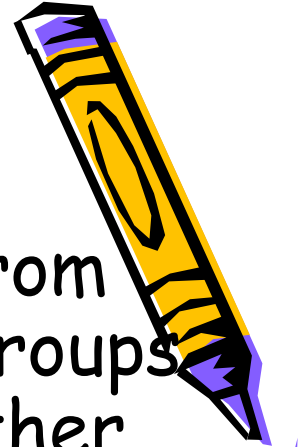


Levels	PRIMARY		SECONDARY		TERTIARY
services	<u>Health promotion</u>	<u>Specific protection</u>	<u>Early diagnosis &amp; treatment</u>	<u>Disability limitation</u>	<u>Rehabilitation</u>
Individual	Diet planning Demand for Periodic visits	Oral hygiene practices	Self examination & referral Utilization of dental services	Use of dental services	Use of dental services
Community	DHE programme, research efforts, provision of oral hygiene aids, lobby efforts	Supervised school brushing programs	Periodic screening & referral Provision of dental services	Provision of dental services	Provision of dental services
Dental professional	Education Plaque control program Recall Reinforcement	Correction of tooth malalignment, Prophylaxis	Complete examination Scaling & curettage, corrective restorative & occlusal services	Deep curettage Root planing Periodontal surgery Selective extractions	Removable & fixed prosthodontics Minor tooth movement, implant



# Conclusion:

- 95- 100% population has been suffering from periodontal disease in various population groups only differing in severity from one to another.
- In the younger age group (till the age of 20 yrs) it is gingivitis; above the age of 30 years 99-100% of the population has been reported to be suffering from periodontal disease.
- 70% population has been suffering from periodontal pockets or bone resorption.



# Questions

- Describe the role of host and environmental factors in the epidemiology of periodontal disease.
- Discuss the role of nutrition in the etiology of periodontal disease
- Describe the relationship between diabetes and periodontal effects
- Discuss the role of local and systemic factors in the etiology of periodontal disease.

