EARLY CHILDHOOD CARIES AND RAMPANT CARIES

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Introduction

WHO

Defined dental caries as localized post eruptive, pathological process of external origin involving softening of the hard tooth tissue and proceeding to the formation of a cavity

- ECC DEFINITION:

- The previous names such as *baby bottle caries and baby bottle tooth decay* give an impression that a bottle is a necessary cause of tooth decay . The term *nursing caries* is more inclusive, but it assumes that breastfeeding or other nursing practices alone could cause the condition. Objections to the term *early childhood caries (ECC) include the inability to define* the age of the children affected and to express its rampant nature

  Community Dent Oral Epidemiol 1999; 27: 313–5

- APPD 2003:

  The presence of one or more decayed(noncavitated or cavitated lesions), missing(due to carious lesions) ,or filled tooth surfaces in any primary tooth in child 71 months of age or younger

Pitts in1930

Massler (1945)

James et al in1950

ELLIAS FOSS 1962

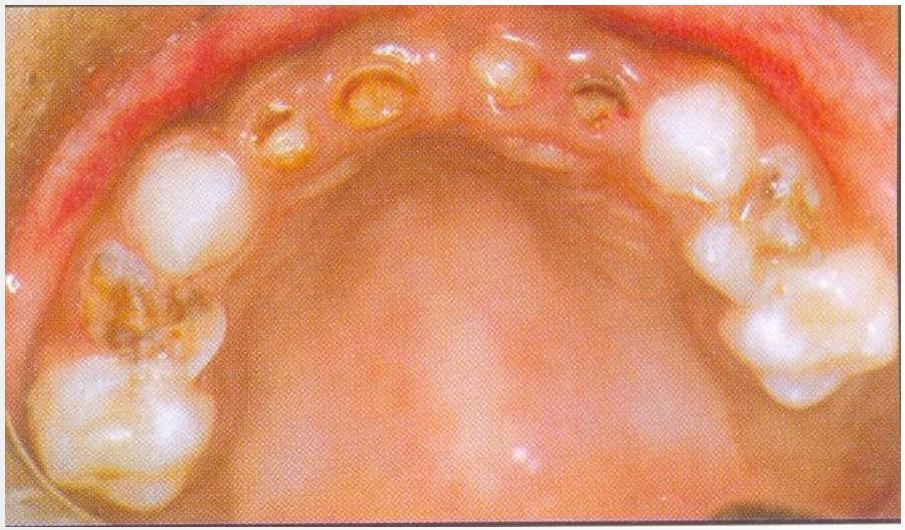
Shelter et al, 1977

Ripa in1978

- National institute for dental and cranio facial research workshop additionally defines ECC as a condition referred to as severe ECC:
  - All children below the age of 3 years with any noncavitated or cavitated lesions are classified as S-ECC children. From age 3 through 5 , one or more cavitated, missing(due to caries) or filled smooth surfaces in primary maxillary anterior teeth, or a decayed missing ,or filled score of >4(age 3), >5(age 4) or >6 (age5) surfaces constitutes S-ECC

ECC

NURSING CARIES RAMPANT CARIES



THEORIES OF DENTAL CARIES

Legend of the worm

Humoral theory

Vital theory

Chemical theory

Parasitic theory (Leewenhock)

Acidogenic theory (Miller, 1889)

Proteolytic theory (Gottlieb 1947)

Proteolysis - chelation theory (Schatz et al 1955)

Sulfatase theory (Pincus 1950)

Complexing and phosphorylating theory (Lura, 1967)

Burch and Jackson hypothesis (1970).

ACIDOGENIC THEORY

- W.D Miller 1882
- Dental decay is a chemoparasitic process

- It is a two stage process - decalcification of the enamel which also results in the destruction of the dentin,- there is dissolution of the softened residue of the enamel and dentin.

destruction is done by the acid attack where as the dissolution of the residue is carried by the proteolytic action of the bacteria.

PROTEOLYTIC THEORY

- Workers like “Heider, Bodecker (1878)and Abbott (1879) contributed considerably to this theory
- the organic portion of the tooth plays an important role in the development of dental caries
- enamel structure which are made of the organic material such as enamel lamelle and enamel rods prove to be the pathways for the advancing microorganisms.

PROTEOLYSIS CHELATION THEORY

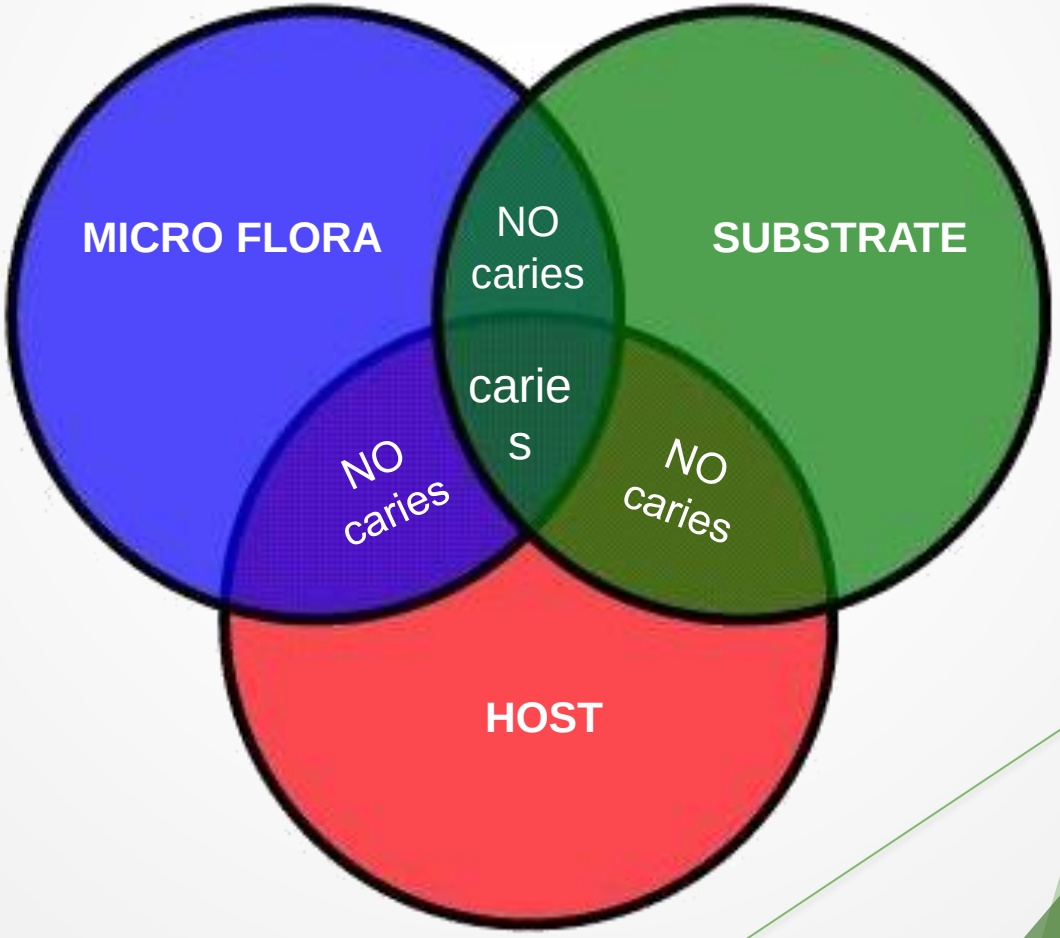
- This theory was put forward by Schatz and his co-workers .

- The bacteria's attack on the surface of the enamel is initiated by keratinolytic microorganisms, result in the breakdown of the protein chiefly keratin and results in the formation of soluble chelates which decalcify enamel even at neutral PH

ETIOLOGY

- **Primary factors**
- **Secondary factors**

KEYS TRIAD, 1960



MOIDIFIED KEYS TRIAD
Newburn, 1982

Secondary factors

- Saliva
- Salivary flow rate
- Salivary viscosity
- Race and ethinicity
- Socio economic status
- Tooth brushing
- Cognitive factors
- Dental knowledge
- Stress Birth weight
- Chronic illness

Host factors

Anatomic characteristic of the tooth:

- Teeth requires an additional 2-3 years for post eruptive maturation.

- Koflow (1977) and Brown et al (1985)

Arch form:

Presence of dental appliance and restoration:

Composition:

Composition of tooth plays an important role in dental caries for example surface zone of enamel is more resistant to caries compared to inner layers due to the presence of:

1. Dicalcium phosphate dihydrate and fluorappatite
2. Increased mineral and less organic matter
3. Decreased water content
4. Increased fluoride, chloride, zinc, lead and iron
5. Decreased carbonate, and magnesium

- 410-873ppm whereas for caries tooth it is 139-223ppm

- Humphery-1987 : enamel hypoplasia is seen in 13-39% of full term infants whereas 62% in low birth weight infants.

Micro flora

- Carlson et al 1975
- Berkowitz et al 1975.

- *After tooth eruption*
  - *Streptococcus Mutans*
  - *Staphylococcus, Veilonella, Neisseria*
  - *Less frequent – Actinomyces, Lactobacillus, Nocardia, Fusobacteria.*
  - *Sporadic – Bacterioids, Candida and Coliform*

- Clark- 1924: mutans streptococci
- For the next 40 years S.Mutans was ignored and was rediscovered by Keyes and Fitzgerald.
- Brown et al: 1978- S.M------HIGH-------- SALIVA/PLAQUE(RAMPANT CARIES)---------XEROSTOMIA
- Van Houte (1980) and Hamada. S. Salade (1980)----SM------DC

- Matto et al: 1996.

- Berkowitz (1996) conducted a study on the etiology of nursing caries. He put forth a three step process in caries formation they are:

- The first step: Primary infection by mutans streptococci.
- Second step: Accumulation of these organisms to pathogenic levels as a consequence of prolonged oral exposure to cariogenic substrates.
- Third step: Rapid demineralisation and cavitation of enamel resulting in rampant dental caries.

Ecology of S.Mutans:

The cariogenicity of S.mutans is probably related to its unique combination of properties, which includes: (Krasse-1989)

- It colonizes the tooth.
- They synthesize extracellular polysaccharide from sucrose using enzyme glucosyl transferase that enable formation of voluminous plaque.

- Produces large amounts of acids even at low pH.
- Breakdowns the salivary glycoprotein.
- Produce considerable amount of lipoteichoic acid.
- More aciduric than other streptococci

Transmission of S.Mutans

- S.mutans are transmitted to the child by:

VERTICAL TRANSMISSION

HORIZONTAL TRANSMISSION

VERTICAL TRANSMISSION

The frequency of infant infection is approximately nine times greater when the maternal salivary levels of S.mutans exceed 10^5 colony forming units / ml of saliva, than when maternal salivary levels are less than 10^3 CFU/ ml- Berkowitz et al 1981.

- Vohler and Brutthall (1978) stated that S. Mutans transfers from Adult to infants through metal spoon.

HORIZONTAL TRANSMISSION

These are transmission occurring from close relatives, siblings, peer groups

Van Loveren et al – demonstrated a likelihood for Horizontal transmission with Mutans.S after 5 years of age.

WINDOW OF INFECTIVITY

- **Carefield** (1993) – 7-31 months of age (primary period of infection).
- **Krass et al**(1967), Edrman et al(1975)– 6-12 years of age (secondary period of infection).
- **Davey and Rogers** (1984) – Additional strains of MS with newly erupting teeth.

- Mutant streptococcus play a major role in the initiation of lesion.
- Lactobacillus acidophilus, lactobacillus casei are minimally involved in caries initiation but are believed to have a key role in caries progression

Role of substrate

- E.Newburn-----DIET REFERS TO THE CUSTOMARY ALLOWANCE OF FOOD AND DRIKS TAKEN BY ANY PERSON FROM DAY TO DAY
- Dietary component primarily responsible for dental caries are fermentable carbohydrate

Sucrose:

- It is the most commonly taken form of carbohydrate
- KRASSAE 1985:It is considered to be most cariogenic because of the following reasons:

1. EASILY DIFFUSE INTO DENTAL PLAQUE

2.It is highly soluble and acts as a substrate both for the production of extracellular polysaccharides and for acid production.

- In infants and toddlers the main source of fermentable carbohydrate are:

  - Bovine milk
  - Human milk
  - Fruit juices
  - Carbonated Beverages
  - Sweet syrups
  - Pacifiers dipped in honey
  - Chocolate, sweets.

BOVINE MILK

Lactose content = 4%

Increased calcium and phosporus

HUMAN MILK

Various forms of casein reduced the adherence of S. Mutans glucosyl transferase to saliva coated hydroxyapatite as well as the expression of enzyme

Lactose content = 7%

Increased calcium and phosporus

- Beonizk-1971:milk
- Lack of food clearance.
- And salivary flow at night.
- Accumulation of milk around the teeth.
- Foss (1962) and Vienna (1971) also suggested that stagnation milk in tooth surfaces could lead to dental decay.

Milk Formulas:

- milk------- lactose (less cariogenic than sucrose).
- Soya based milk-------- fructose-------- cariogenic

Fruit juice

Caries rate -----increase------extrinsic sugars is added along with the acids in the fruit juices.

High natural content sugar--- ↑ pH ranging from 3-4--- erosive effect on the enamel.

Carbonated Beverages:

- High sugar------- carbonated beverages------- increase the pH
- Sodas contain carbonic acid have erosive effect on the tooth enamel.
- Carbonated Beverages ---- ↑Caries
- Frostell (1970) reported a significant decrease in plaque pH after consumption carbonated beverages

Honey:

- Causes caries due to acid producing effect.
- It has high retentive rate

Dietary Metals:

- Fe deficiency: Reduced Salivary flow: ↑Caries
- Pb Excess: ↑Caries (Van Houte-1994)

Time Factor:

- Duration or time affects both severity off the lesions and the number of teeth involved.
- Diley et al (1980): - Weanoing age determined to be 23.4 months
- Berkowitz et al (1984): 15-30 months.

Secondary factor

Salivary flow rate

- When the flow rate is very below normal then the child has more incidence of caries

Saliva viscosity

- Patient with thick, ropy saliva invariably had poor oral hygiene
- Thin, watery saliva has greater oral clearance

OTHER RISK FATORS

Race Ethnicity

- Native American children and Canadian Aboriginal children living on reservations demonstrate a extremely high rate of ECC, ranging from 70%-80%.

Socio Economic Status:

- Low status: - ↓ ability for proper care and to obtain professional health care services
- ↓health status
- ↓resistance to oral diseases and systemic diseases.

Tooth-brushing:

- Increased frequency and better oral hygiene levels are associated with lower caries levels in preschool children

Dental Knowledge:

- Regarding the relationship between microbiology of caries, the role of cariogenic foods and the use of baby bottle is essential in preventing ECC.

Stress:

- anxiety of parents about Dental Rx→ increases caries lesion in children

Birth weight:

- low range:1.8 Kg: increases caries

Chronic illness

- makes child's discomfort: increases intake of sweets by child to get comfort→ increases Caries.

CLASSIFICATION OF ECC

According to Wyne,1999

- Type – I (Mild to moderate)
- Type – II (moderate to severe)
- Type – III (Severe)

Mild-moderate-

- Isolated carious lesions involving molars and incisors.
- Seen in 2-5 years old.
- Cause: combination of cariogenic semisolid or solid food and lack of oral hygiene.

Moderate –severe :

- Labiolingual caries in maxillary incisors.
- Cause: Inappropriate use of feeding bottle or at will breast feeding or a combination of both, with or with out poor oral hygiene.
- Seen soon after first tooth erupts: 6 months

Severe :

- All teeth including mandibular incisors.
- Cariogenic food + poor oral hygiene
- Seen in 3-5 years.

Progression

White area of decalcification/ pitting of enamel surface

↓

lesions get pigmented to a light yellow

↓

spread laterally to proximal surfaces

↓

then spread downwards to incisal surfaces (Pitts-1929)

↓

also lingual surfaces

↓

Circumferential involvement

↓

purchase due to weakening of tooth structure.

Clinical features

The intraoral decay of nursing caries is characteristic and pathognomonic of the condition. It effects the primary teeth in following sequence:

- Maxillary central incisor first:

  The facial, lingual, mesial and distal surfaces

- Maxillary first molars

  The facial, lingual, occlusal and proximal surfaces

- Maxillary canine and second molars, the facial, lingual and proximal surfaces
- Mandibular molars at the later stage
- Mandibular anteriors are spared .

Initial / Reversible stage / Stage -1

Age – 10 – 20 months

- Cervical and interproximal opaque , white chalky demineralizations seen on maxillary anterior teeth.
- Pain or tooth ache does not occur
- The dentist is the only one who make diagnosis, by using air syringe and drying teeth properly.

Stage 2 / Damaged / Carious stage

- Age – 16 – 24 months
- Caries extends in to the dentin and marked discolourations are seen
- Discontinuity of the enamel surface is seen, cavitation of the carious lesion occurs. Parents can now spot the decay.
- Children start complaining of tooth ache on ingesion of extremely cold food eg: ice cream.

Stage 3 / Deep lesions

- This stage is reached in 20 – 36 months. Complaints of pain during toothbrushing or eating especially while biting are frequent.
- Complaints of pain during intake of hot or cold drinks.
- Diagnosis is facilitated if patient complaints of pain during eating, brushing or if child uses canines to incise food.

Stage - 4 / Traumatic stage

Age – 30 – 48 months

- Fractures of one or more carious teeth, cervically are frequent occurance
- A toddler learns to walk when his protective reflexes have not been developed fully. The child falls on his face and some times the incisors fracture, as they are already weakened. The parents donot notice the fractures at times. The fractures of the primary teeth are rare because they are frequently displaced or intruded.
- Hence when weakened by nursing caries, the tooth will tend to fracture in the weakest spot cervically. At times only root stumps remain in the oral cavity.

Diagnosis

- Visual and tactile examination
- Radiographic method
- Tooth separation

RECENT METHODS

- Laser fluorescence
- Electrical conductance measurement
- Fiber optic transillumination
- Magnetic resonance micro-imagery
- Ultrasound
- Caries detector dyes
- Xeroradiography
- Endoscopic method of caries detection

LASER FLUORESCENCE

- Used in early 1980
- Scientific basis- enamel illuminated with blue light from an argon laser, emits yellow light by auto fluorescence
- When caries is present, the intensity of fluorescence is reduced by scattering of light within the lesion
- Dark grey areas of enamel indicates incipient caries

- Diagnodent – recently marketed compact hand held device

- It makes use of laser auto fluorescence technology ,instead of using blue light it uses red light

Electric resistance/ECM

- Became popular in 1980's

- Principle - sound enamel has a high resistance to electric current flow. Pores caries enamel filled with conducting media has an increasingly lower resistance therefore higher conductance

Fiber Optic Transillumination-

- Uses bright fiber optic light to transilluminate a tooth to investigate the presence of caries.
- Trans illumination will be less for carious tooth.
- Newer version of FOTI is digital imaging fiber optic trans illumination where the image is recorded by a CCD digital camera.

Magnetic resonance micro-imagery

- It uses a moderate magnetic field
- This technique is capable of producing highly accurate 3 dimensional picture of teeth

CARIES ACTIVITY TESTS

Defined as the sum total of new caries lesions and enlargement of existing carious cavities during a given period of time.

- To determine the need of personalized preventive measures.
- To motivate and monitor the effectiveness of Health education programs.
- To manage the progress of restorative procedures.
- To identify high risk individuals

CARIES SUSCEPTIBILITY

- Refers to the new number of lesions that may develop in an individual over a period of time

VARIOUS TEST

- Lactobacillus colony count test
- Synder test
- Strip mutans test
- Buffer capacity test
- Fordick Ca dissolution test
- Dewer test
- Swab test
- Reductase test
- Cariostat test
- Caries risk test – bacteria and buffer

LACTOBACILLUS TEST

- **Hadley(1933)**

Method:

- saliva is collected by having the subject chew paraffin before breakfast.This is stored in a bottle and shaken to mix well.
- 0.1cc of saliva is spread over Rogosa agar plate.
- The plate is incubated for 4 days.

Lactobacillus Colonies Developed Are Counted

No.of organisms	Symbolic designation	Degree of caries activity suggested
0--1000	+,--	Little or none
1000--5000	+	Slight
5000--10000	+ +	Moderate
More than10000	+ + + or + + + +	Marked

SNYDER TEST

- This snyders test measures the ability of salivary micro organisms to form organic acids from a carbohydrate medium.
- snyders medium consists of:
  1. Casein
  2. Yeast extract
  3. Dextrose
  4. Agar
  5. Bromocresol green

METHOD

- Saliva is collected by having the subject chew paraffin. A tube of Snyder glucose agar is melted and then cooled at 50°C.

- 0.2ml of saliva is added to the agar tube.The Snyder agar tube with saliva is incubated at 37 °C.

- The color change of indicator is observed after 24,48 and 72 hours.

Color Observations in Snyder test

24 hours	48hours	72hours
If yellow Marked caries susceptibility	***If yellow*** Definite caries susceptibility	***If yellow*** Limited caries susceptibility
If green Continue to incubate &observe for 48hrs	***If green*** Continue to incubate &observe for 72hrs	***If green*** Caries inactive

ALBANS TEST (modified Snyder test)

- Alban modified the Snyder test to make it easier and for use in regular dental office.
- In this method lesser amount of agar is used.
- The agar is taken from the refrigerator but is not heated. To this saliva is added and incubated for 4days.
- Color observations are same as that of Snyder test.

SALIVARY REDUCTASE TEST

- The test measures the rate at which an indicator dye, ***Diazoresorcinol*** changes from blue to red to colorless.
- Method:5ml of saliva is collected by the same method and stirred. It is then mixed with a fixed amount of Diazoresorcinol.
- Color change obtained after 15mins is taken as a measure for caries activity.

COLOR OBSERVATIONS

COLOR	*TIME*	*SCORE*	*CARIES ACTIVITY*
BLUE	15mins	1	Non conductive
ORCHID	15mins	2	Slightly conductive
RED	15mins	3	Moderately conductive
RED	immediately	4	Highly conductive
PINK/WHITE	immediately	5	Extremely conductive

Strip test:

- Saliva or plaque samples are obtained by using tongue blade or tooth picks
- This is transferred to S. mutans strip which is incubated in MSB agar (MITIS SALAVARIUS BACITRACIN AGAR)
- Number of S.mutans is then estimated.
- More than 10^5 colonies per ml of saliva is indicative of high caries activity

Caries risk test

- This is a new quick and effective caries activity test
- It has two components

1. CRT bacteria-It is used to determine cariogenic bacteria
2. CRT buffer- to determine buffering capacity

Method

- Stimulated saliva is collected and applied to both the sides of slide and then incubated for 48 hrs at 37^{o}c

- CRT buffer strips are placed in mouth and the change in colour is used as an indicator for buffering capacity

CARIES RISK ASSESSMENT

AAPD – CAT

Low risk

Oral conditions
- No enamel caries teeth in past 24 months
- Caries "white spot lesions"
- No visible plaque; no gingivitis

Environmental factors
- Optimal systemic and topical, fluoride exposure
- Consumption of simple sugars or foods strongly associated with caries initiation primarily at mealtimes
- High socioeconomic status.
- Regular dental care.

AAPD – CAT

Moderate risk

Oral conditions

- Carious teeth in the past 24 months
- Presence of white spot lesions
- Gingivitis

Environmental factors

- Suboptimal systemic fluoride exposure with optimal topical exposure
- Consumption of between – meal simple sugars
- Midlevel socioeconomic status.
- Irregular dental care.

AAPD – CAT

High risk

Oral conditions

- Carious teeth in the past 12 months
- Presence of white spot lesions
- Radiographic enamel caries
- Visible plaque on anteriors
- High titers of MS
- Enamel hypoplasia
- Ortho treatment

Environmental factors

- Frequent intake of sugars
- Low socio economic status
- No dental care.
- Systemic illness

PREVALENCE OF NURSING CARIES

COUNTRY	YEAR OF PUBLICATION	PREVALENCE PERCENTAGE
England	1967 – 1982	3.1 to 12.0 %
United States	1976 – 1987	1.0 to 53.1 %
Canada	1982	3.2 %
Australia	1985	5.4 %
South Africa	1978 to 1981	3.1 to 12.2 %
Indonesia	1979	48.0 %
INDIA (Manipal)	1996	65.5 %

PREVENTION

Professional care

Home care

PROFESSIONAL CARE

- Parents education regarding importance of deciduous teeth, gum pads cleaning, tooth brushing, frequent mouth rinsing.
- Diet counseling
- topical fluoride if needed.
- Application of fissure sealants
- Regular recalls, motivation.

Home Care

- Elimination of cariogenic food items from the diet
- Substitution with tooth friendly food
- Discouraging bottle feeding at night
- Falling asleep with pacifiers should be stopped
- Digital or baby tooth brushing as the teeth erupts
- Regular visit to dental clinic once in six months.

American Academy of Pediatric Dentistry (AAPD) Recommendations for prevention of Early Childhood Caries

- Infants should not be put to sleep with a bottle. Adlibitum nocturnal breast feeding should be avoided after the first primary tooth begins to erupt.
- Infants should be weaned from bottle at the age of 12-14 months .
- Oral hygiene measures should be implemented by the time of eruption of the first primary tooth.
- An oral health consultation visit within six months from the eruption of the first primary tooth .

PARENT COUNSELING

- Parent counseling can be defined as educating the parents regarding the child's oral health status, optimal health care and informing them about the prevention of potential dental diseases.
- Dental development of their child
- Appropriate feeding practices emphasizing the hazards of improper bottle and breast-feeding.
- Oral hygiene measures appropriate for infants and toddlers.

Pre-natal counseling

- Primary teeth start forming at 3 months after conception, so it is important that the mother gets proper nutrition, stays in good health.
- Avoids medications which are either harmful to her baby's teeth.
- Imbalance in the mother's calcium and phosphorus levels due to fever or infection during pregnancy can also lead to disruptions in the baby's tooth structure

ANTICIPATORY GUIDANCE

- Nowak (1995) describes anticipatory guidance as a proactive, developmentally based counseling technique that focuses on the needs of a child at each stage of life.

- **First dental visit**: AAPD- within six months of the eruption of the first primary tooth but not later than 12 months of age.

ORAL HYGIENE PRACTICES

Gum Pads

- The cleaning of gum pads is started as early as first week of birth.
- Lay the baby down with his/her head in your lap and feet pointing away.
- Take a small gauze (2" x 2") between thumb and forefinger and wipe vigorously over the ridge of the baby's top and bottom jaws.
- infants tooth brushes, finger coats and wipes can also be used.
- Clean at least twice a day, morning and after last feed in the night

IDEAL PEDODONTIC BRUSH

- Diameter of each nylon filament – 0.007” – 0.008”
- Tufts – 24-33.
- Long handle
- Small head size

RECOMMENDED BRUSHING TECHNIQUES FOR CHILDREN

- Scrub or circular scrub are best for young children
- Soft to medium brushes are more efficient.
- Time taken is at least 2 ½ to 3 minutes to cover the entire surface

- Recommended level of flouride in water WHO – 1971

0 – 1.2ppm

Cold climate – 1.2ppm

Hot climate – 0.7ppm

Recent recommendation WHO – 1994

0.5 – 1ppm

Guidelines for F supplements in areas with less than 0.3ppm fluoride

Age mg F per day

- Birth – 6 months - 0
- 6 months to 3 years - 0.25mg
- 3 years to 6 years - 0.50mg
- 6 years and over - 1.00mg

Fluoride supplements should not normally be given to children living in areas with water containing fluoride at a level of 0.7ppm or more.

Guidelines for F supplements in areas at or between 0.3 and 0.7ppm fluoride

Recommended use of flouride tooth paste

- Below 4 years – not recommended
- 4 – 6yrs – brush once with fl tooth paste and once with non-fl tooth paste
- 6 – 12yrs – Brush twice with fl – tooth paste and once with non-fl tooth paste
- Above 12yrs – Brush 3 times with fl tooth paste.

Topical flouride used in clinics

- NaF – 2%
- SnFl – 8%
- APF - solution – 1.23%
- APF – gel – 1.23%

Flouride varnishes

- Bifuride 12 [2.71% - NaF, 2.92%CaF]
- Duraphat
- Florprotector
- Flouritop

Flouride rinses

Programe	Agent	Frequency	Fl – concentration	Volume	Amount of Flouride
HOME	0.05% NaF	Daily	0.023%	10ml	2.3mg
	0.044% APF	Daily	0.02%	10ml	2mg
	0.01% SnF	Daily	0.024%	10ml	2.4mg
SCHOOL		Weekly	0.09%	10ml	9mg

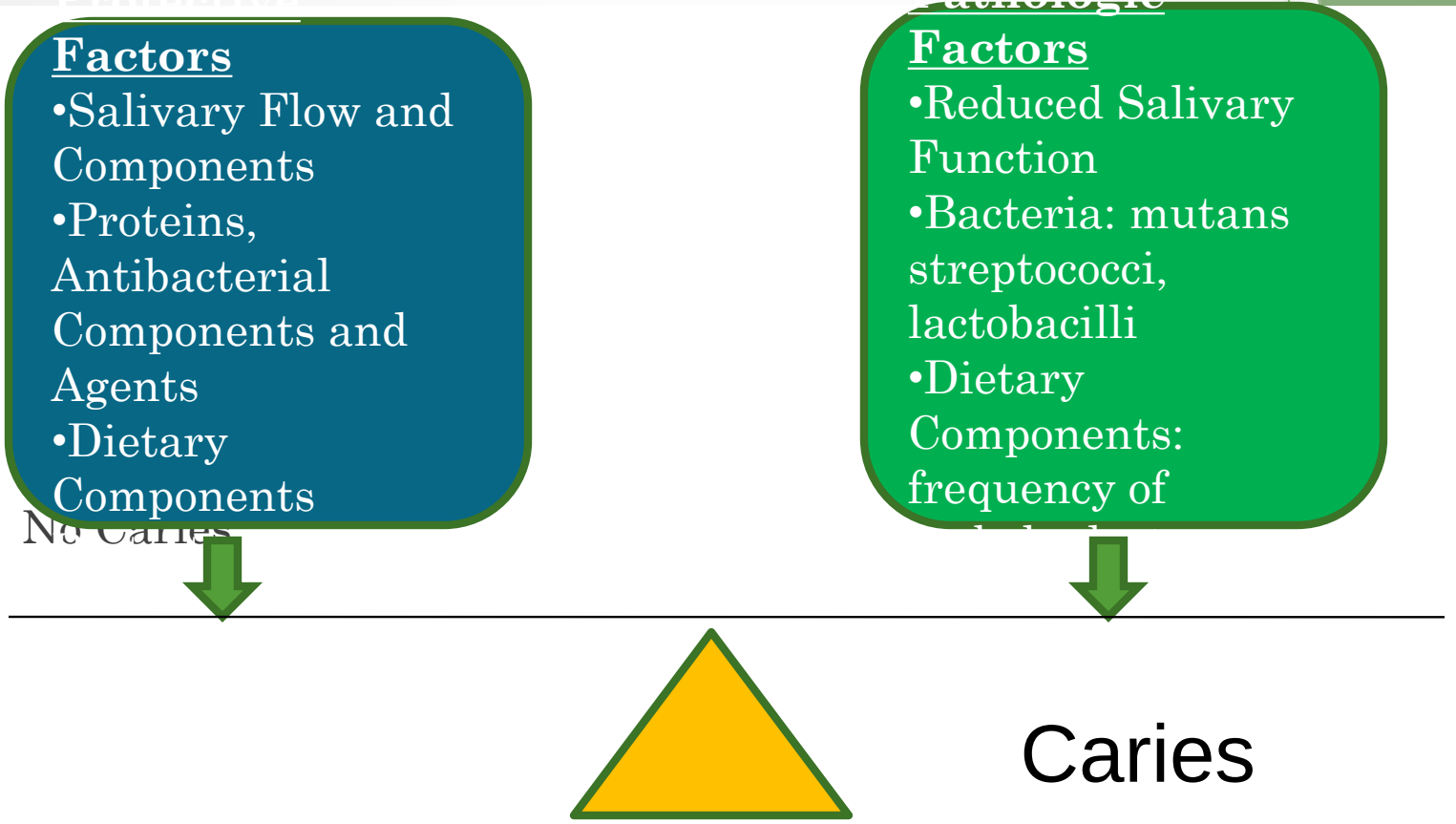
Combating the Caries inducing microbes

Increasing the resistance of tooth structure to caries attack

Modifying the diet and augmenting salivary factors

Walsh - 2004

Caries Balance

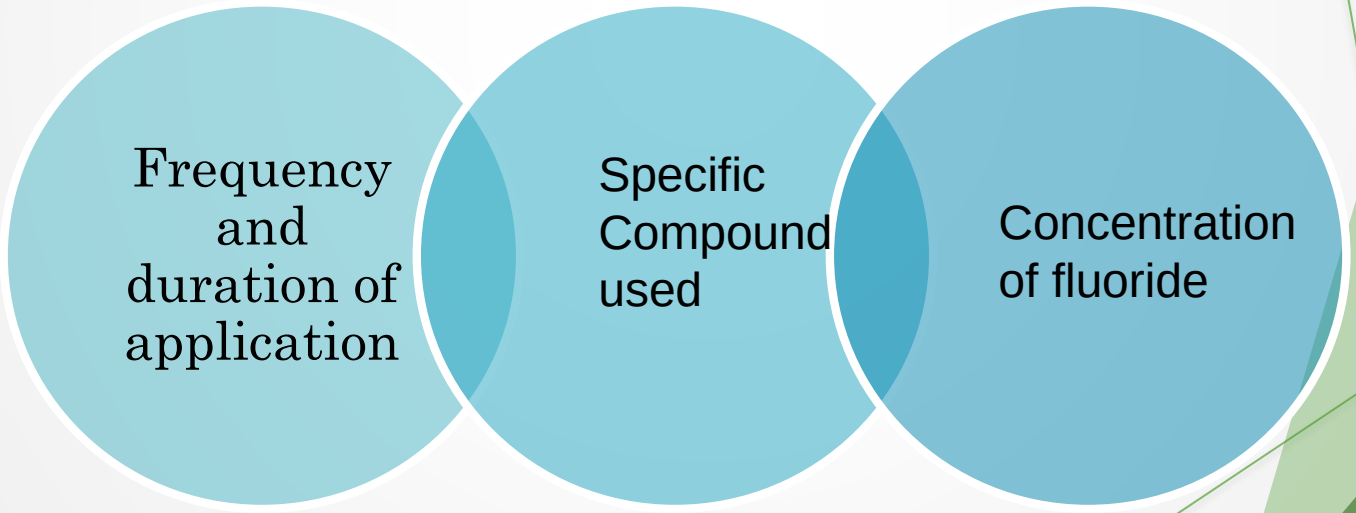


Advances in Antiplaque agents

- Anti-bacterial and anti-adherence agents are being tested as plaque building blockers.
- Inhibition of Glucan Mediated Adhesion. (Competitive inhibitors, Anti GTF Antibodies)
- An ecological shift from a cariogenic to a non cariogenic biofilm.

Fluorides

- *Key agents In battling dental caries.*
- *Efficacy of topical fluorides depend on:*



Featherstone 2000

- Fluoride varnish applied 2x/year was found to be more efficacious, in caries reduction, than a weekly rinse of NaF.

- Fluoride releasing pit and fissure sealants

  (FISSURIT-F)

- Dual- phase systems containing NaF and Dicalcium phosphate Dihydrate

Remineralization Therapy

- A new RM technology has been developed based on Phosphopeptides from Milk Casein.
- The CPP-ACP nanocomplexes have been shown to localize at the tooth surface and prevent enamel demineralization.
- Trademarked as “Recaldent”

Nova Min Technology

- Novamin is a proprietary formulation of calcium, phosphate, sodium and silica which is Odorless, colorless and biocompatible.
- Only man made mineral which directly leads to formation of hydroxyapatite crystals.
- Extraordinary desensitization and whitening effects.

- The biomimetic process uses the body's existing mechanism for the defense and rebuilding of teeth .

- When Nova Min is exposed to saliva, it releases Ca and Po4 ions that become available to the body's natural RM process.

- In toothpaste, Nova Min improve RM in early lesions by 68% as against fluorides

Caries Management Tools For The Future

Early caries detection:

Fluorescence,

Optical coherence tomography,
Electrical impedance

Ultrasonography.

Chairside caries screening
a)Cultural assays
b)Immune assays
(GC-saliva check ,
Ivoclar vivadent, Dentocult-SM

Biofilm (plaque thickness and maturity)

- Disclosing with erythrosin dye
- Fermentation tests
- 2-Tone disclosing (GC Plaque-Check)

Replacement therapy

- *S. mutans* strain BCS3-L1- genetically modified effector strain designed to prevent dental caries.

- Recombinant DNA technology was used to delete the gene encoding for lactate dehydrogenase in BCS3-L1.

Alkalinization strategies

Ecologic pressure on biofilm utilizing the arginine deaminase and ureolylitic properties of certain bacteria.

- Elevates plaque pH
- Polyarginine (CaviStat™)

Lasers

- Co2 laser irradiation increased acid resistance of enamel at a rate of 20 pulses in100 microseconds.
- It caused an irregular ,rough and melted enamel surface and increased the bonding strength between the resin and enamel surface

Altering biofilm communication pathways

- Blocking the cell to cell signalling ("quorum sensing") within the biofilm.
- Reduces the ability of the biofilm to tolerate stresses .
- Slowing the biofilm accumulation rate may be possible using agents such as furanone which affect quorum sensing.

Targeted therapies

- "Magic bullet" and "smart bomb" therapies
- Antibodies to particular bacterial species in the biofilm could be conjugated to a toxin or biocide.
- Photosensitization of biofilm bacteria.

FEEDING PRACTICES
Breast feeding

- From nutritional point of view, breast milk has several systemic and immunological advantages over proprietary formulas.
- However, and at will breast feeding, beyond the stipulated weaning time of the child, specially throughout the night and sometimes throughout the day, has been associated with nursing caries.
- AAPD- soon after the first primary tooth erupt
- WHO- 2yrs

BOTTLE FEEDING

- AAPD- if used it should be stopped by 12-14 months

SOME IMPORTANT TIPS FOR BOTTLE FEEDING

- Remove the bottle immediately after feeding
- Encourage your baby to stay in upright position while feeding
- Use a nipple that has a small hole so that it enables the infant to work with perioral muscles.
- It should not be used as a pacifier
- Give water after feeding with the bottle and clean the mouth soon after feeding.

TREATMENT PROPER

FIRST VISIT

- Parent education
- Collection of saliva to estimate flow rate and viscosity
- Caries activity test
- Plaque index,gingival bleeding index
- Seal the open lesions
- Fluoride tooth paste,topical fluoride application
- Diet chart

SECOND VISIT (after 10 days)

- Diet chart analysis
- Isolation of sugar factors
- Diet modification
- Explain the pt about the role of sugar and plaque in the progression of caries
- Reassess the restoration
- Caries activity test
- Plaque index, gingival bleeding index
- Recall after 15 days

THIRD VISIT

- Pulpotomy
- Endodontic treatment
- Extractions
- Crowns
- Review and recall

Conclusion

Rampant Caries is a distressing clinical condition, confronting the child, parents and the dentist.Successful management of rampant caries depends upon coordinated approach by paediatrician, paediatric dentist, parent and the child.