Tooth Discolouration in Children
Objectives of the session

• Discuss the various causes of extrinsic and intrinsic tooth discolouration.
• Describe the various management of discoloured teeth appropriate for children.
Introduction

• The colour of teeth is of particular cosmetic importance.

• The coronal portion of a tooth consist of enamel, dentine and pulp.
• Any changes in these structures will lead to alteration in tooth colour due to changes in its light transmitting or reflecting properties.

• To a large extent, tooth colour is determined by enamel translucency.
Classification of tooth discolouration

- Tooth discolouration could be classified based on the source of discolouration.
- Sources of tooth discolouration could be either extrinsic or intrinsic to the tooth.
Sources of extrinsic stains

• Poor oral hygiene: This results in stain by chromogenic bacteria giving green and orange stains to the teeth.

• Drugs such as iron supplements and minocycline which results in black stains.
Sources of extrinsic stains - 2

• Beverages and food such as kolanuts, coffee.
• Prolong use of chlorhexidine results in brown or black stains of the tooth.
• Use of rifabutin results in red stains of the teeth.
Clinical features of extrinsic stains

• **Poor oral hygiene:** stains usually follow the gingival contour at cervical third of the tooth.

• **Beverages, food and drugs:** Stains affects all surfaces of the tooth.
Management of extrinsic stains

• Reassure patients and parents.
• Where stains result from beverages, food, and drugs, such stains can be removed by prophylaxis.
• Patient with poor oral hygiene will need to be taught good tooth brushing techniques.
Intrinsic stains

• Intrinsic discolouration is endogenous stains which are incorporated into tooth substance.
• Intrinsic stains could arise from enamel or dentine defects.
• Such pathologies could either have local or systemic origins.
Aetiology of enamel intrinsic stains

Local causes

• Intrusion of the primary teeth may cause the root of the tooth to impinge on the tooth bud of the succeedaneous teeth, disturbing the laying down of matrix on the crown of permanent tooth.

• Periapical infection of primary tooth can also cause the same problem described above.

• These usually happens in the anterior teeth.
Local causes - 2

- Enamel caries appears as a chalky white discolouration of the tooth. This may also be come discoloured and appear as brown discolouration of the tooth.
- Idiopathic
Aetiology of enamel intrinsic stains - 3

Systemic causes

- Chronological enamel hypoplasia
- Amelogenesis imperfecta
- Molar Incisor hypomineralisation
- Systemic drug use such as tetracycline
- Fluorosis
- Idiopathic
Aetiology of dentine intrinsic stains

Local causes

• untreated dentine caries
• Internal root resorption
• Metallic intracoronal restorative materials
• Necrotic pulp tissue
• Root canal filling materials
Aetiology of dentine intrinsic stains - 2

Systemic causes

• Congenital porphyria
• Dentinogenesis imperfecta
• Systemic intake of drugs e.g. tetracycline
Discolouration associated with caries

3 stages of caries associated with intrinsic stains

• Decalcification phase: enamel appear chalky white in appearance
• Cavitation phase: the cavity can appear brown or yellow in colour
• Arrested caries: this appears brown or black
Discolouration associated with pulp changes

- **Pulp injury**: With tooth injury could result in severance of the blood vessel, release of red blood cells into the dentinal tubules, disintegration of the red blood cells with formation of haemosiderin. The tooth colour therefore gradually changes from red, to brown to black. If pulp necrosis does not occur, there may be reversal of the tooth discolouration.
Discolouration associated with pulp changes - 2

• **Pulp injury**: the pulp is hyperaemic. The tooth will have a diffuse pinkish red discolouration. Also, tooth injury could result in

• **Pulp necrosis**: the tooth appear brownish or greyish in colour.

• **Pulp calcification**: the tooth appears yellowish months after injury.
Discolouration associated with pulp changes - 3

- **Internal root resorption:** There is a localised area of pinkish discolouration of the crown which grows larger with time. The pinkish discolouration is a reflection of the pulp tissue through the enamel resulting from resorption of the dentine.

- **Root canal medicament:** Greyish discolouration from the use of camphemonochlorophenol.
Discolouration arising from trauma

- Trauma could lead to loss of tooth vitality. This can then result in greyish discolouration due to necrotic pulp tissue.
Discolouration arising from infection

• Infection of primary tooth. An infected tooth could develop a periapical abscess. The abscess erodes the succeedaneous tooth follicle, disturbs amelogenesis and cause a localised area of enamel defect.

• The resulting tooth is called a Turner’s tooth.
Enamel hypoplasia

• Hypoplasia results from disturbances in enamel matrix lay down due to disturbances in the function of ameloblasts or unavailability of material for matrix formation.
Chronological enamel hypoplasia

- Enamel matrix formation could be disturbed by constitutional symptoms that arise during the prenatal, neonatal or postnatal period.
- Prenatal disturbances arises from maternal illnesses.
- Neonatal and postnatal disturbances arises from childhood illnesses.
Prenatal causes

• Rubella infection during the 2\textsuperscript{nd} to 14\textsuperscript{th} weeks of pregnancy may produce a range of defect in a child’s dentition.

• This vary from isolated pits on enamel to enamel aplasia involving more than half of the crown of the tooth with yellowish to brown discolouration.
Prenatal causes - 2

- Other prenatal causes of enamel hypoplasia are maternal hypoxia, maternal avitaminosis, and congenital syphilis.
Chronological enamel hypoplasia - 4

Neonatal causes

• Rhesus incompatibility: This leads to foetal jaundice accompanied by primary tooth staining and enamel hypoplasia.

• The colour varies from yellow to green, bluish green, brown or grey stains.

• Discolouration is usually located occlusally or incisally.
Chronological enamel hypoplasia - 5

Neonatal causes – 2

- Other causes are sickle cell disease, thalassemia, prematurity, neonatal asphyxia Neonatal hypocalcemia.
Post natal causes

- Fluorosis is caused by excessive chronic ingestion of fluoride either from naturally occurring sources in drinking water or from over dosage of fluoride supplements and toothpastes, or a combination of the two.
- It can occur in the primary dentition but is largely confined to the permanent dentition.
Post natal causes - 2

- Tetracycline could be due to prenatal, neonatal or postnatal ingestion
- Tetracycline ingestion is contraindicated from utero to 12 years postnatal period.
- Chlortetracycline will produce greyish brown discolouration while oxytetracycline produces yellowish discolouration.
• These disturbances produce a linear band of hypoplastic enamel which corresponds to the time and duration of the disturbance.
Hereditary causes of tooth discolouration

- Amelogenesis imperfecta
- Dentinogenesis imperfecta
- Epidermolysis bullosa
- Ehler Danlos Syndrome
- Alkaptonuria
- Congenital Porphyria
Amelogenesis Imperfecta

- Amelogenesis imperfecta is a genetic disorder.
- There are different modes of inheritance as well as a wide variety of presentations.
- Incidence is 1 in 10,000 live birth.
- It affects both the primary and permanent dentition.
Diagnosis of enamel hypoplasia

• The history should be able to suggest the cause of the lesion.
• Diagnosis is usually based on clinical presentation.
• Hypoplastic teeth should be treated promptly as progression of caries lesion on hypoplastic teeth is faster.
Treatment of hypoplasia

- Restoration of hypoplastic teeth can be challenging.
- Composite restorations could fail since the enamel have fewer prisms than non-hypoplastic tooth. This makes for fewer pores and poorer retention of composite restorations.
Treatment of intrinsic stains

• Where lesion is minor and isolated, microabrasion would be adequate using acid pumice.
• Bleaching could be considered.
• Composite facing or veneering could be done for anterior discoloured teeth
• For stabilisation and protection of the posterior occlusion, onlays or preformed crowns could be used.
Microabrasion

- Use for surface enamel defects only
- Use 18% HCL in pumice
- Rub mix on tooth for five seconds
- This can be repeated 10 times
- This remove about 0.1mm enamel at each application. Continued till desired change occur
- Polish enamel
- Apply topical flouride
Bleaching

- For vital tooth bleaching, apply hydrogen peroxide on tooth surface and apply heat.
- Repeat till desired result is obtained.
- Avoid tea, red wine for a while after treatment to prevent staining.
- For non vital tooth bleaching, use sodium perborate applied repeatedly in the root canal.
Veneers

Indications

• For hypoplastic tooth
• Where there is mild discolouration
• Where there is associated tooth wear
• There is increased success by bleaching first
Veneers - 2

Contraindication

- Severe discolouration
- Edge to edge incisor relationship
- Deep bite
- When patient has oral habits like pencil chewing and nail biting
Veneers - 3

Types of veneers

• Acrylic laminate veneer
• Composite resin veneer
• Porcelain veneer
Crows

• Can use veneered steel crown or nusmile crowns for primary incisors and canines.
• Stainless steel crowns can be used for primary molars or as temporary restoration for permanent molars.
• Porcelains jacket crown gives the best aesthetic result for permanent anterior teeth.
Aetiology of intrinsic stains in children include the following:

a. Pulpal necrosis
b. Poor oral hygiene
c. Fluorosis
d. Beverage
e. Amelogenesis imperfecta
Quiz 2

Treatment modalities for intrinsic stains in children are:

a. Microabrasion
b. Topical fluoridation
c. Veneering
d. Bleaching
e. Pumice prophylaxis
Quiz 3

Alkaptonuria:

a. Causes extrinsic tooth discolouration
b. Is an hereditary cause of tooth discolouration
c. Causes enamel and dentine discolouration
d. Associated discolouration can be treated by veneering
e. Associated discolouration can also be removed by S&P
Acknowledgement

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