Training Dentists to Use the Modified DDE Index To Assess Enamel Defects

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Acknowledgements

• Expert Panel:
  – Dr. Margherita Fontana (University of Michigan)
  – Dr. Yihong Li (New York University)
  – Dr. Robert J Schroth (University of Manitoba)
  – Dr. Kim Seow (University of Queensland)
  – Dr. John Warren (University of Iowa)
  – Dr. Tim Wright (University of North Carolina)
Early Childhood Caries (ECC)

- The World Health Organization (WHO) identified caries as one of the most prominent infectious diseases in the world, affecting 60-95% of children—in developed and developing countries.

- In 2014, prevalence of untreated ECC in American Indian/Alaska Native was 43.6%
Public Health Crisis
Enamel Defects

• “Enamel Defects are disturbances in the process of apposition and mineralization of dental enamel and may be manifested as enamel hypoplasias or opacities.” (Oliviera et al., 2006)

• The very few longitudinal studies that focus on the relationship between enamel defects and caries risk, suggest that enamel hypoplasia is a significant risk factor for caries and should be considered in caries risk assessment (Oliviera et al., 2006; Hong et al., 2009)
A few studies have suggested that enamel hypoplasia, particularly in anterior teeth, is associated with ECC

- Targino AGR, Rosenblatt A, Oliveira AF, Chaves AMB, Santos VE. *Oral Diseases* 2010.
• The mechanism is believed to involve preferential colonization of mutans streptococci in hypoplastic defects


• Hypoplasia in primary anterior teeth associated with prenatal smoking, excessive weight gain, low birth weight, prematurity and post-natal measles.

Objective

• To design a questionnaire in order to assess the ability of dentists to correctly identify and classify Development Defects of Enamel (DDE) as distinct from early dental caries

Long Term Objectives

• Develop a field guide that dentists can use to accurately diagnosis and classify enamel defects, so that we can:
  • Determine the frequency of enamel defects in very young children before caries starts in these areas.
  • Document the rate of initiation of caries in enamel defects vs. sound enamel (to determine role in caries risk assessment)
  • Determine the effectiveness of preventive treatments in enamel defects vs. sound enamel
Research Design

• IRB approval from Univ. of Michigan and IHS (Exempt)
• Modified DDE (MDDE) Index used to classify the enamel defects
• De-identified images scored by a panel of experts.
• Consensus score used as the gold standard score in the evaluation of survey respondents
• Survey done electronically using Qualtrics
Research Design

- **Participants:**
  - AAPD listserv (N=6174; response rate: 5.47 %)
  - IHS dentists & Expanded Function Dental Assistants (EFDAs)*

- Data was anonymous and participation voluntary

- Agreement of each respondent’s score with the expert score evaluated using kappa statistics and percent correct

* IHS data is not shown
Please score this image

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<th>% response</th>
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AAPD Survey Results

- Frequency and % correct for each tooth by group obtained by comparing to “Expert Panel Consensus Scores”.
- Groups compared using Chi-square test, p<0.05
- The mean % correct for each AAPD participant is 73.8 (SD=14.6).
AAPD Survey Results

There were significant differences in responses between participants and “expert panel” responses for the following images: (AAPD responses are <65% correct)

- Hypoplasia
- Diffuse Opacity
- Others, Caries
Thank you

Title: *Hejran* (Farewell)
Medium: Adobe Photoshop
Purpose: To apply Photoshop for Persian calligraphy

Questions?