Higher BMI Associated With Lower defs/t in a High-risk Population

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ABSTRACT

Purpose: The aim of this retrospective chart review was to determine the relationship of body-mass index (BMI), caries risk assessment (CRA), and defs/t (decayed, extracted, filled surfaces/teeth) scores.
Methods: Charts of 1000 children, 3-5 years old, with ASA 1 classification were identified. Data extracted from the electronic dental record included age, gender, race, height, weight, American Academy of Pediatric Dentistry CRA<6 form data, and defs/t scores. Analysis of variance and generalized linear model analysis were completed; p-values less than 0.05 were considered significant.
Results: The majority of patients in this cohort were classified as high caries risk (91.2%). Higher defs scores were associated with BMI percentile (*P*=.01) and BMI category *(P*=.03), and higher deft scores were associated with ethnicity (*P*=.005) and BMI percentile (*P*=.009). In this high caries risk dataset, as BMI Percentile increases, defs and deft scores decrease (*P*<.05). CRA form questions involving special health care needs and teeth brushed daily did not influence defs/t scores (*P*>.05); all other form questions influenced either/both defs/t scores. No interaction was detected between BMI and high/average/low CRA<6 designation (*P*>.05).
Conclusion: The CRA<6 form overall designation based on the caries risk assessment form is significant in predicting defs and deft scores and most CRA<6 questions differentiated between risk/no risk. In this cohort of mostly high caries risk individuals, as BMI percentile increased, defs/t scores decreased, demonstrating that other risk factors play a larger role in caries risk.

BACKGROUND

- Obesity and dental caries are multi-factorial health concerns, complex entities, and both can greatly affect the human body as a whole.
- The American Academy of Pediatric Dentistry Caries Risk Assessment (CRA) Form is utilized by providers to predict a patient's risk of developing caries (Figure 1). Obesity is not included on this form.
- The existing literature regarding the relationship of caries and BMI is inconclusive, with studies concluding a positive, negative, or no correlation.
- The goal of this study was to evaluate items on the caries risk form and patient-specific variables (ethnicity, gender, BMI) to determine correlation with defs/t.

We hypothesize that children with a higher BMI have a higher caries incidence than children with a lower BMI and the caries risk form is a better predictor of caries than solely BMI.

METHODS

- UTHealth Houston Institutional Board approved this retrospective study (HSC-DB-23-0502).
- Charts of 1000 children, 3-5 years old, with ASA 1 classification from the UT Graduate Pediatric Dentistry Clinic were identified, and the following information was obtained:
  - Age, Gender, Race, Height, Weight, AAPD CRA<6 form data, and defs/t scores.
- Analysis of variance and generalized linear model analysis were completed; p-values less than 0.05 were considered significant.

RESULTS

- The majority of patients in this cohort were classified as high caries risk (91.2%).
- CRA form questions involving special health care needs and teeth brushed daily did not influence defs/t scores (*P*>.05); all other form questions influenced either/both defs/t scores (*P*<.001).
- Higher defs scores were associated with BMI percentile (*P*=.01) and BMI category *(P*=.03), but ethnicity and gender were not statistically significant (p>0.05). Higher deft scores were associated with ethnicity (*P*=.005) and BMI percentile (*P*=.009), but gender and BMI category were not statistically significant (p>0.05).
- In this high caries risk dataset, as BMI Percentile increases, defs and deft scores decrease (*P*<.05) (Figure 2 and 3).
- No interaction was detected between BMI and high/average/low CRA<6 designation (*P*>.05).

Figure 1. Caries Risk Assessment Form <6 years old. All items except those in red associated with caries (*P*<.001)

Risk factors, social/behavioral/medical
- Mother/primary caregiver has active dental caries
- Parent/caregiver has life-time of poverty, low health literacy
- Child has frequent exposure (>3 times/day) between-meal sugar-containing snacks or beverages per day
- Child uses bottle or nonspill cup containing natural or added sugar frequently, between meals and/or at bedtime
- Child is a recent immigrant
- Child has special health care needs

Risk factors, clinical
- Child has visible plaque on teeth
- Child presents with dental enamel defects

Protective factors
- Child receives optimally-fluoridated drinking water or fluoride supplements
- Child has teeth brushed daily with fluoridated toothpaste
- Child receives topical fluoride from health professional
- Child has dental home/regular dental care

Disease indicators
- Child has noncavitated (incipient/white spot) caries lesions
- Child has visible caries lesions
- Child has recent restorations or missing teeth due to caries

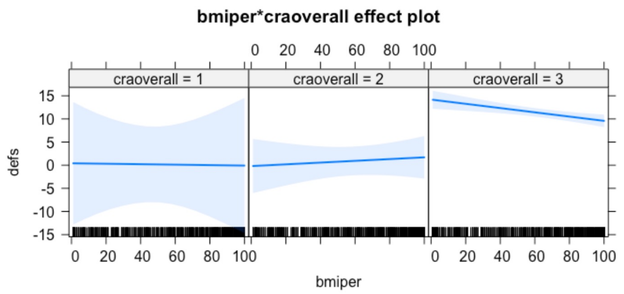

Figure 2. As BMI percentile increased, defs scores decreased for high-risk patients.

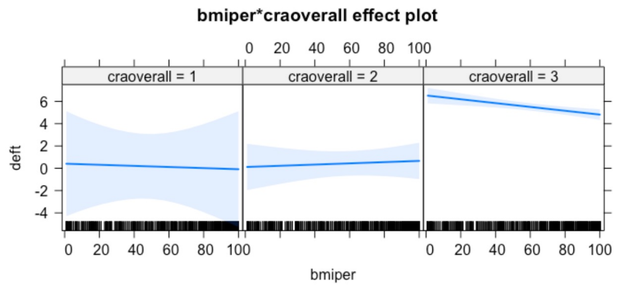

Figure 3. As BMI percentile increased, deft scores decreased for high-risk patients.

DISCUSSION

- The CRA<6 form overall designation based on the caries risk assessment form is significant in predicting defs and deft scores and most CRA<6 questions differentiated between risk/no risk.
- In this cohort of mostly high caries risk individuals, as BMI percentile increased, defs/t scores decreased (Figure 1 and 2), demonstrating that other risk factors play a larger role in caries risk.
- Limitations include:
  - The dependence on other providers' record-keeping accuracy with regards to patient height, weight, caries, and completion of caries risk form.
  - A multi-provider clinic, meaning various providers' ability to correctly identify caries may be a factor that influences deft/s scores.
- Future research on this topic should incorporate patients from various caries risk categories and not solely on a high-risk cohort.

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