

PEDIATRIC DENTISTRY

Predicting dental caries experience in preschoolers



BACKGROUND

Dental caries contributes significantly to poor general health in children. A relatively small proportion of children suffer the major burden of oral disease. Socioeconomic and lifestyle factors may offer a way to predict dental caries experience, with oral health often affecting overall health from infancy through adulthood. Maternal health during pregnancy is also an important contributing factor in dental caries development. Several maternal health conditions and behaviors have been associated with adverse outcomes in their children, including maternal smoking during pregnancy and obesity. A Swedish study followed a cohort of more than 65,000 children from age 3 to age 7 years and evaluated the effect of socioeconomic factors, maternal health, and maternal health behaviors during pregnancy on children's development of dental caries.

METHODS

This cross-sectional study included all the children who were born between 2000 and 2003 and were living in Stockholm County, Sweden, at age 3 years and who were followed up until age 7 years. Data on the socioeconomic conditions, maternal health, and maternal health behaviors were gathered from national registries. The 2 outcomes of interest were caries experience at ages 3 and 7 years, expressed as decayed, extracted, and filled teeth (deft). A total of 65,259 children completed the study.

RESULTS

At age 3 years, 5.5% of the children had caries lesions. At age 7 years, this had increased to 18%.

The variables considered were divided into socioeconomic factors and maternal health behaviors. Associations between these variables and dental caries experience were evaluated at ages 3 and 7 years.

Socioeconomic Factors

Mothers born in low-income countries were more likely to have a child with caries at both 3 and 7 years of age. Compared with mothers in the highest economic quintile, those in the lowest economic quintile had a higher risk of having a child with caries experience at ages 3 and 7 years. In addition, having an educational level of less than 9 years increased the likelihood of having a child with caries by 1.8 times. When mothers had more than 2 children, the risk of caries experience was 1.4 times higher.

Maternal Health Factors

Mothers who had children with caries at age 3 years tended to be younger, were born in a low-income country, had more than 1 child, had a low family income, smoked during pregnancy, were obese, and were more likely to have been diagnosed with a health condition. Pregnancy before age 25 years increased the risk of caries by 1.3 times in children age 3

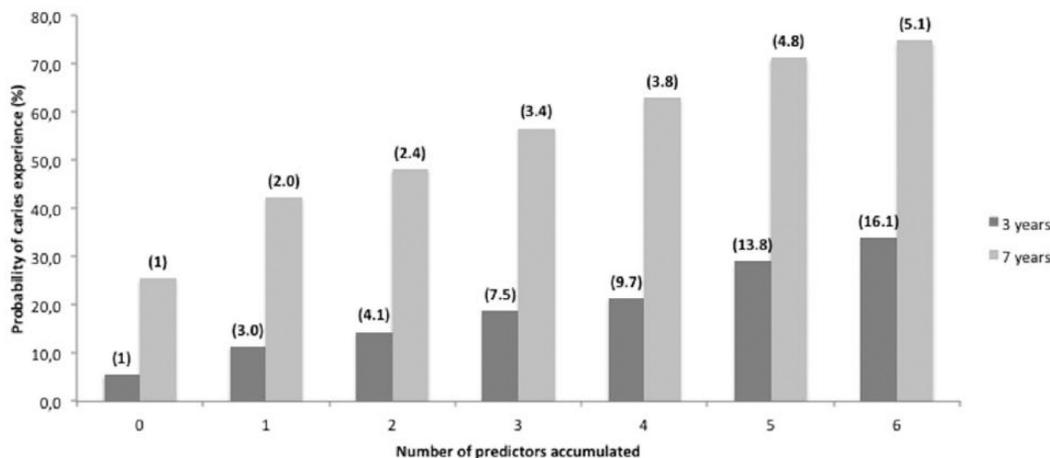


Figure 2. Cumulative percentage probability of caries experience at 3 and 7 y of age. The multivariate cumulative risk is in parentheses at the top of each column. When none of predictors was used, relative risk = 1. Predictors: 1 = mother's nationality, 2 = mother's nationality + parity, 3 = mother's nationality + parity + family income, 4 = mother's nationality + parity + family income + mother's age, 5 = mother's nationality + parity + family income + mother's age + smoking, 6 = mother's nationality + parity + family income + mother's age + smoking + obesity. (Courtesy of Juhlén A, Soares FC, Hjern A, et al: Socioeconomic determinants, maternal health, and caries in young children. *JDR Clin Translational Res* 3:395-404, 2018.)

years and 1.4 times at age 7 years. Obesity increased the child's risk of caries by 1.3 times at age 3 years and 1.2 times at age 7 years. Smoking during pregnancy increased the risk of caries in children by 1.6 at both ages.

Probability of Developing Caries Analysis

When none of the risk factors were present, the estimated probability of having caries at age 3 years was 5.6%. In contrast, when all the risk factors were present, the cumulative probability was 33.9% (Figure 2). When all the risk factors were present, the child had a risk of developing dental caries 16.1 times higher than when none of them were present. At age 7 years, the cumulative probability of caries was increased to 74.7% when all risk factors were present. The risk was 5.1 times higher for children with all risk factors present compared to those with none present.

DISCUSSION

Both socioeconomic factors and maternal health behaviors contributed to the oral health of preschool children in Sweden. Maternal obesity and smoking during early pregnancy were seen as predictive of caries experience in these young children. The socioeconomic factors most significantly associated with caries experience at ages 3 and 7 years were country of birth, low maternal educational level, low family income, and family situation.

Clinical Significance

It's difficult to modify factors such as education, income, and other socioeconomic factors in the short term. Therefore, interventions must be developed to increase parental motivation and self-efficacy so that parents are equipped with the will, the knowledge, and the tools required to help prevent dental caries in their children. Clinicians may also need to collect a more detailed history of maternal health and health behaviors during pregnancy. This would permit planning for interventions that could help to ensure the best oral health possible in young patients.

Julihn A, Soares FC, Hjern A, et al: Socioeconomic determinants, maternal health, and caries in young children. *JDR Clin Translational Res* 3:395-404, 2018

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