

# Early childhood caries in relation to mode of delivery, preterm birth, tooth brushing habits, and signs of the metabolic syndrome

Akademisk avhandling

som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentlig försvaras i föreläsningssal Tallen, Drottning Silvias Barn- och Ungdomssjukhus, den 21 november, klockan 13.00

av Katarina Boustedt

Fakultetsopponent:

Tove Irene Wigen, Associate Professor  
Oslo University, Norway

## Avhandlingen baseras på följande delarbeten

- I. Boustedt K, Roswall J, Dahlén G, Dahlgren J, Twetman S. Salivary microflora and mode of delivery: a prospective case control study. *BMC Oral Health* 2015;15:155.
- II. Boustedt K, Roswall J, Twetman S, Dahlgren J. Influence of mode of delivery, family and nursing determinants on early childhood caries development: a prospective cohort study. *Acta Odontologica Scandinavica* 2018;76:595–599.
- III. Boustedt K, Dahlgren J, Twetman S, Roswall J. Tooth brushing habits and prevalence of early childhood caries: a prospective cohort study. *Eur Arch Paediatr Dent* 2019 Jul 23. doi: 10.1007/s40368-019-00463-3.
- IV. Boustedt K, Roswall J, Kjellberg E, Twetman S, Dahlgren J. A prospective study of perinatal and metabolic risk factors for early childhood caries. *Submitted*.

**SAHLGRENKA AKADEMIN  
INSTITUTIONEN FÖR KLINISKA VETENSKAPER**



# Early childhood caries in relation to mode of delivery, preterm birth, tooth brushing habits, and signs of the metabolic syndrome

**Katarina Boustedt**

Avdelningen för pediatrik, Institutionen för kliniska vetenskaper, Sahlgrenska akademien, Göteborgs universitet, Sverige, 2019.

## Abstract

**Background:** Early childhood caries (ECC) is defined as the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled surfaces in any primary tooth of a child under 6 years of age. ECC is highly prevalent in the world and it shares common risk factors with other non-communicable diseases. ECC can impair quality of life due to acute and chronic pain. ECC is difficult to predict, even though several risk factors are known. The influence of mode of delivery on the oral microbiota needs to be further explored.

**Aim:** The aim was to study how mode of delivery affects oral bacteria and to explore whether mode of delivery, early oral habits, family characteristics, perinatal, nutritional and nursing factors during the first 2 years of life are associated with ECC, as well as whether there is a correlation between ECC and metabolic risk factors.

**Methods:** In paper I, 149 infants, delivered either vaginally or by cesarean section, were followed. Saliva samples were collected at 0, 1, 3, and 6 months of age and then analyzed with the checkerboard DNA-DNA hybridization technique. Questionnaires recorded family characteristics, nursing factors, and oral and feeding habits. In papers II–IV, 395 infants were invited to a prospective medical study focusing on growth and overweight. The group was merged with 156 infants born by cesarean section, for endocrine research purposes. The children were dentally examined at 2, 3, and 5 years of age. Medical data were extracted from hospital records. At 6.5 years of age, the children were re-examined at the pediatric clinic.

**Results:** Children delivered vaginally had a greater oral bacteria diversity. Children delivered by cesarean section, born preterm, and born SGA, had elevated risk of ECC at the age of 5. Tooth brushing less than twice daily increased the risk of ECC. Preterm birth or being born SGA raised the risk of ECC. Preschool children with ECC had higher fasting glucose levels, but no other signs of the metabolic syndrome.

**Keywords:** early childhood caries, preterm, caries, cesarean section, the metabolic syndrome, small for gestational age, tooth brushing, oral microbiota.