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Title: Elective caesarean section affects the risk of asthma medication in children up to five years of age

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Body: It has been hypothesized that elective caesarean section is related to an increased risk of asthma due to lack of labour and delayed microbial colonization. Few studies have distinguished between elective and emergency caesarean sections and the findings have not been consistent. Some studies have also observed a risk associated with vacuum extraction. Method: We examined the association between mode of delivery and retrieval of asthma medication in a register based national cohort (n=205,540). Unconditional logistic regression models were used in an analysis of all first born children aged 2-5 and 6-9 years for the outcome of inhaled steroid (ICS) use while adjusting for potential confounders. An age-matched sib-pair analysis was also performed, taking into account shared genetic and environmental risk factors. Results: Analyses of first-borns demonstrated that elective caesarean section was associated with an increased risk of ICS use in both age groups. The increased risk remained in the sib pair analysis of 2-5 year olds (OR=1.21) and was partly explained by shorter period of gestation (aOR=1.12). The sib pair analysis could not confirm any association between elective caesarean section and ICS use in 6-9 year olds. Emergency caesarean section and vacuum extraction had some association with asthma medication in the analyses of first-borns but all associations disappeared in the sib pair analyses. Conclusion: Elective caesarean section contributed to a modestly increased risk of asthma medication up to five years of age. The associations between emergency caesarean section or vacuum extraction and asthma medication in the firstborns could be caused by residual confounding.