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Abstract Title: Maternal characteristics associated with vaping in pregnancy

Background: The potential for harm to developing foetuses by tobacco products is well established. Studies have focused on cigarette smoking as a source of exposure. The use of electronic cigarettes (vaping devices) has increased in recent years. The Office for National Statistics (ONS) reports vaping data among the general public, with the most recent estimates showing a 5% prevalence among all women. However, there is no data on prevalence of vaping among pregnant women in the UK. This study sought to estimate the prevalence of vaping during pregnancy and to explore the factors and outcomes associated with vaping in a population-based sample of women giving birth in England.

Methods: The study was a cross-sectional population-based postal survey of maternal and infant health and care, the National Maternity Survey (NMS) 2018. A total of 16,000 women aged 16+ years who were living in England and who had given birth in 2017 were invited to participate. They were identified at random from birth records by the ONS, and surveyed at 6 months post-partum. Demographic and clinical questions about their pregnancy, labour, birth, and post-natal period were sent to them on a questionnaire. We estimated the prevalence of vaping and patterns of cigarette smoking in this group of women, and conducted regression analysis to explore associations between maternal characteristics and vaping, and between vaping and birth outcomes. Survey data were weighted to reduce the potential for non-response bias.

Results: The crude prevalence of vaping among pregnant women was 2.8%. This varied according to the pattern of cigarette smoking in pregnancy: 0.3% in never-smokers; 3.3% in ex-smokers; 7.7% in women who quit smoking when they became pregnant (pregnancy-inspired quitters); 9.5% in women who temporarily stopped smoking while pregnant but resumed smoking after the birth of their baby (temporary quitters); and 17.7% in women who continued to smoke during and after their pregnancy (persistent smokers). Younger women, unmarried women, women with fewer years of formal education, women living with a smoker, and persistent smokers (compared to quitters, ex- and never-smokers) were more likely to vape. Vaping was also associated with 3.2 weeks' reduction in the duration of breastfeeding and 10% reduction in the prevalence of breastfeeding for at least 8 weeks. However, there was no evidence of association between vaping and any of the maternal characteristics or birth outcomes after adjusting for the pattern of cigarette smoking in pregnancy.

Conclusion: The prevalence of vaping among pregnant women in the NMS 2018 survey was low. Characteristics associated with vaping were broadly similar to those associated with smoking. Adverse birth outcomes and reduced breastfeeding among pregnant women who vape may be explained by their relatively higher prevalence of cigarette smoking.