

Respiratory medicine

Asthma admissions in under 5s fall following smoking ban in vehicles

Hospitalisation rates for asthma in preschool children have significantly declined since the ban on smoking in vehicles carrying children in Scotland, a study has found.

The research team used Scottish Morbidity Record data to identify all 32,342 emergency admissions to hospital for asthma among children over the 19-year study period from 2000 to the end of 2018.

Restrictions were first introduced limiting smoking in public places in March 2006, in March 2014 there was a mass media campaign on the hazards of smoking indoors in the presence of children and in December 2016 legislation banned smoking in vehicles with children.

The primary outcome was monthly incidence of emergency hospital admissions for asthma. Interrupted time-series analyses were used to study changes in monthly asthma emergency admissions per 100,000 children after the introduction of smoke-free vehicle legislation, taking into account previous smoke-free interventions. Subgroup analyses according to age and area deprivation were also performed.

The analyses were repeated for other respiratory conditions such as lower respiratory tract infections, croup, otitis media and bronchiolitis and also for gastroenteritis, as a control condition.

Of the total study group, 13,954 (43%) were younger than 5 years and

18,388 (57%) were aged 5-15 years. Around a third (10,179) of the children admitted to hospital lived in areas in the most deprived quintile, 5,775 in the middle quintile, and 4,046 in the most affluent quintile.

After the introduction of smoke-free vehicle legislation, there was a non-significant decline in the slope for monthly emergency admissions to hospital for asthma among children younger than 16 years -1.21% (95% CI: -2.64 to 0.23%) relative to the underlying trend in hospital admissions for childhood asthma.

However, children younger than 5 years had a significant decline in the slope for monthly asthma admissions, 1.49% (95% CI: -2.69 to -0.27%) over and above the underlying trend among children in this age group. A similar decline was not seen in children aged 5-15 years.

The monthly admissions for asthma fell significantly among children living in the most affluent areas -2.27% (95% CI: -4.41 to -0.07%) but not among those living in the most deprived areas.

These reductions were over and above those seen with the two previous smoke-free interventions.

There was no change in the rate of hospital admissions for gastroenteritis following the 2016 legislation and no change in either age group for the other respiratory conditions reviewed.

The study authors conclude: 'After the introduction of smoke-free vehicle legislation in Scotland, admissions to hospital for asthma among preschool children have fallen significantly.'

As with any observational study, an association cannot prove causation. However, the authors argue that: 'Our findings satisfy many of the Bradford Hill criteria for causation. A causal effect of the smoke-free vehicle legislation on childhood asthma hospital admissions is plausible, given existing evidence of an association between exposure to second-hand smoke in cars and childhood asthma and the effectiveness of legislation at reducing exposure.'

'The decline in admissions to hospital occurred after the introduction of the legislation, showing temporality, and was specific to asthma (not occurring for gastroenteritis) and to preschool children, who spend more time with their parents.'

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Mackay DF, Turner SW, Semple SE et al. Associations between smoke-free vehicle legislation and childhood admissions to hospital for asthma in Scotland: an interrupted time-series analysis of whole-population data. *Lancet Pub Health* 2021;6:e579-86

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