

Early-life antibiotics use increases the risk of asthma and eczema: a discordant twin study.
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Epidemiological studies have shown that early-life exposure of antibiotics in children increases risk of asthma and eczema. However, causal relationships were difficult to assess in these studies (1,2).

Aims

To investigate evidence for causality in the relationship between early-life antibiotic use and development of asthma and eczema in a Dutch twin cohort.

Methods

We investigated 7,386 children (age: 3-10 years) from the Netherlands Twin Register prospectively followed by questionnaires (3). Outcome was defined as parental-reported asthma at age 3, 5, 7 or 10 years. Early-life antibiotic exposure was defined as parental-reported use of antibiotics between 0-2 years. Individuals derived from twin pairs were included in unmatched case-control analyses, using generalized estimating equation models. Conditional logistic regressions were performed in twin pairs using a co-twin control analysis. This design includes disease discordant twin pairs. Affected twins were matched to their healthy co-twin. It takes advantage of the fact that MZ and DZ twin pairs share different degrees of genetic relatedness and share their environment, while exposure to antibiotics can differ within twin pairs (4).

Results / Conclusions

Early-life antibiotic use was associated with an increased risk of asthma (OR: 1.28, 95% CI: 1.18-1.45; n=7,386) and eczema (OR: 1.17, 95% CI: 1.08-1.27; n=7,038) in affected twins with unrelated controls. After controlling for shared environmental factors by analysing disease

discordant MZ and DZ twin pairs (healthy co-twin as control), the risk of developing asthma was significantly increased (OR: 1.84, 95% CI: 1.05-3.22, n=536), but non-significant for eczema (1.21, 95%CI: 0.81-1,80; n=946). After controlling for both shared environmental and genetic factors in disease discordant MZ pairs, increased risk remained, but not statistically significant for developing asthma (OR: 3.33, 95% CI: 0.92-12.11; n=138) and eczema (OR: 2.00, 95% CI: 0.90-4.45; n=306). Lack of statistical power may be a reason for reaching this borderline significant finding. We could not correct for prescription of antibiotics caused by viral infections, which may be a confounder. Our results suggest that the association between early-life antibiotic use and asthma or eczema is not confounded by environmental or genetic factors, and might be causal. The risks and benefits of using antibiotic therapy in young children should be considered before the start of therapy.

References

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