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Extended Research Article

Establishing the best step-up treatments for children with uncontrolled asthma despite inhaled corticosteroids: the EINSTEIN systematic review, network meta-analysis and cost-effectiveness analysis using individual participant data

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Plain language summary

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Plain language summary

Asthma causes symptoms of cough and difficulty in breathing. An asthma attack happens when symptoms get really bad. The first choice of medicine is a low-dose steroid inhaler. If asthma symptoms continue, then other medicines can be given.

We used a systematic review to identify all available clinical trials about medicines for children with asthma whose symptoms continue even when taking a low-dose steroid inhaler. We asked all researchers to share the data they had originally collected with us and combined results using a network meta-analysis. We performed an economic assessment to identify which treatment option might represent the best value for money for the National Health Service.

We found 144 clinical trials but could only include data from 48 clinical trials. We found that increasing the dose of inhaled steroids to a medium dose and adding a medicine called long-acting β_2-agonist was most likely to reduce the chance of getting an asthma attack and improve the amount of air that can be forced from the lungs in 1 second (forced expiratory volume in 1 second). We found that a medicine called leukotriene receptor antagonist is not a good option by itself.

There were no deaths recorded, hospital admissions were rare, and there were no big differences in adverse events or health-related quality of life between medicines, but we did not have much data to look at this. We could not find evidence to show whether a medicine might work better for particular groups of patients, and more research would be needed.

Our economic analysis suggests that low-dose steroid inhalers offer the best value for money, as they are less expensive than other treatment options. However, medium-dose inhaled corticosteroid (alone and + long-acting β_2-agonist) were associated with the highest number of quality-adjusted life-years, but they did not represent good value for money as their cost-effectiveness exceeded the threshold set by the National Institute for Health and Care Excellence.

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This article

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