



Title Paracetamol and Ibuprofen for the Treatment of Fever in Children: The PITCH Randomized Controlled Trial

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Aim

To assess the relative clinical and cost effectiveness of paracetamol and/or ibuprofen in treating fever in children.

Conclusions and results

Paracetamol and ibuprofen are increasingly used together for fever, despite a lack of evidence regarding their clinical or cost effectiveness.

For additional time without fever in the first 4 hours, using both medicines was superior to paracetamol (adjusted difference 55 minutes, 95% CI 33 to 77; $p < 0.001$) and may have been as good as ibuprofen (16 minutes, 95% CI -6 to 39; $p = 0.2$). Both medicines together cleared the fever 23 minutes (2 to 45; $p = 0.015$) faster than paracetamol, but no faster than ibuprofen (-3 minutes, -24 to 18; $p = 0.8$). For additional time without fever in the first 24 hours, both medicines were superior to paracetamol (4.4 hours, 2.4 to 6.3; $p < 0.001$) and ibuprofen (2.5 hours, 0.6 to 4.5; $p = 0.008$). No benefits for discomfort or the other fever-associated symptoms were found, although power was low for these outcomes. An exploratory analysis showed that children with higher discomfort levels had higher mean temperatures. No difference in adverse effects was observed between treatment groups. In 24 hours, 8% and 11% of children respectively received more than the recommended maximum number of doses of paracetamol and ibuprofen.

Recommendations

Doctors, nurses, and parents wishing to use medicines to treat young children unwell with fever should be advised to use ibuprofen first, and that to maximize the time without fever over 24 hours, two medicines are superior to either one. Pragmatically, we speculate that if a child remains unwell after a first dose of ibuprofen, subsequent use of both medicines will be more effective than either monotherapy. However, if two medicines are used, we recommend that all dose times are carefully recorded to avoid accidental overdosing. The economic

analysis shows that the use of both medicines should not be discouraged on the basis of cost to either parents or the National Health Service.

Methods

See Executive Summary link at www.ncchta.org/project/1412.asp.

Further research/reviews required

For *dose-by-weight* regimens to be used safely in the community, studies should investigate the dose implications of differences between estimates of children's weights measured by parents using domestic scales and those measured by professionals using pediatric scales. Furthermore, adequately powered research is needed to investigate the relative effectiveness of two versus one medicine for discomfort and other fever-associated symptoms. An adequately powered study is also needed to improve the precision of the cost-effectiveness estimates.