Short Report

Paracetamol and ibuprofen for treatment of fever in Malawian children aged less than five years

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In Malawi, the national policy advocates the use of acetaminophen (paracetamol) for treatment of fever and the use of sulfadoxine–pyrimethamine (SP) for treatment of malaria in children aged <5 years. While some studies have found paracetamol and ibuprofen to be comparable in reducing fever in children (KRISHNA *et al.*, 1995; MCINTYRE & HULL, 1996; HAMALAINEN *et al.*, 1997), others have found ibuprofen to be superior to paracetamol (AUTRET *et al.*, 1997). No previous study with either drug has been conducted in Malawi. We compared the antipyretic efficacy of paracetamol and ibuprofen in children aged <5 years with fever and with or without uncomplicated *Plasmodium falciparum* malaria.

In May 1997, at the end of the peak malaria transmission season, children <5 years of age attending the outpatient clinic of Matiki Health Centre, Dwangwa, in central Malawi, and whose parents consented were evaluated for axillary temperature ≥37·5°C by clinicians. Children were randomized to receive either paracetamol tablets (50 mg/kg/24 h) or ibuprofen tablets (20 mg/kg/24 h). Each tablet was crushed and mixed with a small quantity of water before being administered to a child; both treatments were given every 6 h for 3 consecutive days. Subsequent treatments were given at home, following the same protocol.

Thick blood smears were collected and stained with Giemsa and parasite density was calculated by counting asexual parasites against 300 white blood cells (WBCs) and assuming a standard white cell count of 6000 WBCs/mm^3. During follow-up visits, nurses measured the child's axillary temperature and administered a questionnaire to the mother to determine her perception about the child's progress. Children with malaria were treated with a single oral dose of SP (500 mg–25 mg tablet), and followed with blood smears on days 3 and 7 (D3, D7) to determine treatment failures. Parents were instructed to return with any child whose condition was perceived to be not improving. Children requiring hospital admission were excluded. Data were analysed by EpiInfo 6.01 (DEAN *et al.*, 1995); significance test was set at $P < 0.05$.

Patients in the 2 groups were similar at enrolment when compared by age, weight, temperature, malaria diagnosis, and parasite density; however, the patients in the ibuprofen-treated group were more likely to have received any treatment within 1 week of enrolment than the patients in the paracetamol group (65·4% vs 41·4%, $P < 0.05$). Malaria and respiratory illnesses were the most frequent diagnoses among the enrolled patients (69·1% and 25·5%, respectively). Although malaria diagnosis was slightly more common among the paracetamol-treated group than among the ibuprofen-treated group (71·4% vs 66·7%), this difference was not statistically significant. There was no statistical difference in fever resolution time when compared by treatment group (Table); all patients resolved their fever by D3 of follow-up. Comparison of children with a diagnosis of falciparum malaria with those without yielded no significant difference in fever resolution time. Among children with a diagnosis of falciparum malaria ($n = 38$), 11 (28·9%) were still parasitaemic on D3 and 2 (5·3%) were still parasitaemic on D7; both patients were resistant at the RII level (1 in each treatment arm). There was no difference in the percentage still parasitaemic when compared by treatment group. Mothers of children in the 2 groups were equally satisfied with the progress of their children by D2 (78·6% for paracetamol and 77·8% for ibuprofen) and by D3 (92·9% for paracetamol and 92·6% for ibuprofen). Children perceived by mothers to have not improved by D3 of follow-up were those with *Plasmodium falciparum*-resistant malaria. No death occurred among the patients.

Table. Number of children still febrile at follow-up after treatment with paracetamol or ibuprofen

Follow-up day[a]	Paracetamol ($n = 28$)	Ibuprofen ($n = 27$)
Day 1	6 (21·4)[b]	8 (29·6)
Day 2	5 (17·9)	4 (14·8)
Day 3	0 (0·0)	0 (0·0)

[a]Initial treatment was on day 0.
[b]Percentage of the group is shown in parentheses.

This study suggested that paracetamol and ibuprofen were equally effective in reducing fever among children aged <5 years with or without uncomplicated falciparum malaria. One of the main purposes of treating children with uncomplicated malaria with an antipyretic is to lower their temperature as well as offer them symptomatic relief. This study found paracetamol and ibuprofen to be equally effective in achieving this purpose as mothers perceived the 2 drugs to be equally effective in providing symptomatic relief to their children with fever. The decision to use either drug as an antipyretic for children in Malawi should be based on availability and cost for the average family.

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References

Autret, E., Reboul-Marty, J., Henry-Launois, B., Laborde, C., Courcier, S., Goehrs, J. M., Languillat, G. & Launois, R. (1997). Evaluation of ibuprofen versus aspirin and paracetamol on efficacy and comfort in children with fever. *European Journal of Clinical Pharmacology*, **51**, 367–371.

Dean, A. G., Dean, J. A., Burton, A. H. & Dicker, R. C. (1995). *EpiInfo 6: a word processing, database, and statistics program for epidemiology on microcomputers*. Atlanta: Centers for Disease Control.

Hamalainen, M. L., Hoppu, K., Valkeila, E. & Santavuori, P. (1997). Ibuprofen or acetaminophen for the acute treatment of migraine in children: a double-blind, randomized, placebo-controlled, crossover study. *Neurology*, **48**, 103–107.

Krishna, S., Supanaranond, W., Pukrittayakamee, S., ter Kuile, F., Supputamangkol, Y., Attatamsoonthorn, K., Ruprah, M. & White, N. J. (1995). Fever in uncomplicated *Plasmodium falciparum* infection: effects of quinine and paracetamol. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **89**, 197–199.

McIntyre, J. & Hull, D. (1996). Comparing efficacy and tolerability of ibuprofen and paracetamol in fever. *Archives of Diseases of Childhood*, **74**, 164–167.

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