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Role of Paracetamol and oral Ibuprofen as Antipyretics in Children with Fever

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ABSTRACT

Objective: To compare the clinical effectiveness of Paracetamol with Ibuprofen as an antipyretic, fever relief and linked discomfort in children.

Study Design: Comparative cross-sectional study.

Place and Duration of Study: Combined Military Hospital, Abbottabad Pakistan from Apr to Nov 2019.

Methodology: Children aged six months to five years, who reported fever between 38-41°C were included. Two temperature groups were developed, i.e., 37.8–38.9°C and 39–41°C with baseline temperatures of 38.60±0.56 for Paracetamol-Group and 38.58± 0.56°C for Ibuprofen-Group. The prescriptions were given over to the parents with clarification about the dose of the medication. The medication had active and placebo forms. Information was gathered until saturation was done.

Results: A total of 104 children were taken in the study. Of these, 77(74.08%) were females, and 27(24.96) were males. Comparing Ibuprofen-treated children with Paracetamol-Group, the final result showed that the extent of children's temperature management was greater in the Ibuprofen-Group 37(71%) than in the Paracetamol-Group 34(65%).

Conclusion: Doctors, attendants and guardians wishing to use medications to treat children suffering from fever should be encouraged to use Ibuprofen first and to consider the relative risks and advantages of using Ibuprofen in addition to Paracetamol for fever. Comparatively, Ibuprofen is more effective than Paracetamol.

Keywords: Antipyretic, Fever, Ibuprofen, Paracetamol.

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INTRODUCTION

Fever is a cause of discomfort for children and also causes anxiety for the parents as it affects the budget of the Health system.[1,2] Every year about 70% of preschool children suffer from this issue which causes disturbance in their activities, hunger and sleep problems in the affected children. Respiratory tract infections are common in winter and are mostly associated with fever and self-limiting infection of the respiratory tract.[3,4] Therefore, the antipyretics are commonly available and purchased at the counter; an estimate shown in a study for the sale of Paracetamol and Ibuprofen suspension for children was £0.2M prescribed in Wales alone in 2002, which was equal to about £4.2M for the UK.[5,6] The ratio of Paracetamol prescription was seven times higher than ibrufen.[7]

The previous literature said that no criteria set for the normal temperature in children could quantify the body temperature. Practically, it is noted that normal temperature fluctuates from time to time and is different in various body areas.[8] The decision, Ibuprofen is more effective than Paracetamol in the initial 4hrs, is reliable with the literature. One study found that the antipyretic movement of Ibuprofen grows faster (26-mints) than that of Paracetamol, which found, interestingly, past studies have demonstrated that chance of most extreme antipyresis is lower for Paracetamol than for Ibuprofen (134 vs 184 mints-correspondingly).[9,10]

Practically different researchers estimated different times and temperature decreases, but no one explored the clinically significant time to accomplish antipyresis. Our study aimed to compare the clinical effectiveness of Paracetamol with Ibuprofen as an antipyretic, fever relief & linked discomfort in children.

METHODOLOGY

The comparative cross sectional study was conducted at the Combined Military Hospital, Abbottabad Pakistan, from April to November 2019 after the approval from the Ethical committee and informed consent was also taken from the guardian of all participants.

Included Criteria: Children aged six months to five years, who reported fever between 38-41°C due to any cause, were included in the study.

Exclusion Criteria: Children with body weight equal to or less than seven kilograms, children with a disease which require hospital admission (Indoor Patients), with some neurological disease, i.e. epilepsy or else

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allergic or intolerant reaction to the study drugs or children with peptic ulceration/bleeding were excluded from the study.

The confirmation of all these exclusion conditions was mostly done by the clinician to whom the child had access. The record of children was checked from the register and approached by the parents with research proforma on their consent.

The initial 24-hours of data were taken from the loggers, covering the primary outcome. Furthermore, axillary digital thermometry was performed on 4hrs, 6hrs, one day, two days and the fifth day as secondary values for managing risk when the data logger fails or is non-compliant.

The prescriptions were given over, and clarify the medication dose and how to enter the information in the proforma. The medication had active and placebo forms and the dose was referenced. After the principal dosages of the medications, the researcher requirements were explained to the guardians.

For the assessment of symptoms and temperature after the four hours of the first dose, a detailed log was needed for the drugs given. Different steps were followed to make this diary simple and easy to understand/complete. The first dose columns were filled by the researcher, who guided the parents on how to fill them according to the dose and time the space was left for the parents. All the columns with the option of symptoms were explained to the parent. In addition, they guided the parents not to delay the medical advice or be concerned about any symptoms due to unwanted drug effects.

Data were analyzed using Statistical Package for the social sciences (SPSS) version 23.00 and MS Excel 2016 software. Mean±SD was calculated for the continuous variable. Frequency and percentage were calculated for categorical variables. The chi-square test and t-test were used. The *p*-value of ≤0.05 was considered significant.

RESULTS

A total of 104 children were taken in the study. Of these, 77(74.08%) were female, and 27(24.96) were males. The mean weight of the children was noted as 13.63±3.30kg. Two temperature groups were developed, i.e. 37.8–38.9ºC and 39–41ºC with baseline temperatures of 38.60±0.56 for Paracetamol and 38.58±0.56ºC for Ibuprofen. The discomfort was noted, as shown in Table-I.

Table-I: Discomfort noted with temperature in both groups before given the dose (n=104)

Discomfort Noted Before Dose	Paracetamol- Group	Ibuprofen- Group
No discomfort	4(7.7%)	6(11.5%)
Not exactly fine	30(57.7%)	25(48.1%)
Minor pain or distress	17(32.7%)	19(36.5%)
Weeping or very-distressed	1(1.9%)	2(4%)

Duration of the fever was noted in both groups, and found temperatures ≤24 hrs were 18(35%) in the Paracetamol- Group and 19(37%) in the Ibuprofen-Group and >24 hrs were 34(65%) in the Paracetamol-Group and 33(63%) in Ibuprofen- Group. The secondary outcome <24 hours for the groups and mean temperature at 48 hours and five days and recovery of the children are shown in detail below in Table-II.

Table-II: Recovery of the Children in Study Groups (n=104)

Outcomes	Paracetamol-Groups (n=52)	Ibuprofen-Groups (n=52)
<24 hours		
Recovered child	4(8%)	9(17%)
at 48 hours		
Mean temperature (ºC)	36.40±0.89	36.40±0.85
Recovered child	15(29%)	14(27%)
At Day 5		
Mean temperature (ºC)	36.20±0.93	36.10±0.78
Recovered child	21(40%)	17(33%)

DISCUSSION

This study showed that quicker and progressively drawn-out time with no temperature in the initial four hours, supporting the effect of Ibuprofen above Paracetamol. The suggestion was that Ibuprofen might be the best treatment for decreasing fever-related symptoms, especially at 24hrs. Furthermore, the study found no proof of comparison fever-related inconvenience at 48hrs or any other period. There had all the allocation of being no distinction between treatment groups in the recurrence of antagonistic impacts or the fairness of the prescriptions.

It is a great challenge for parents, attendants, or doctors who decide the best treatment choice for the children in base number medicines.[11,12] While different studies have demonstrated that Paracetamol is better than placebo treatment,[13,14] this study recommends that guardians wishing to give quicker and increasingly delayed fever improvement in the initial 4hrs should use Ibuprofen in inclination to Paracetamol. However, where manifestations are relied upon to last in any episode 24 hours (most children with fever),

guardians needing to amplify the time without fever should think about the relative side effects (coincidentally exceeded the greatest prescribed dose) and advantages (an extra 2.5 or 4.4hrs with no fever) of substituting the two prescriptions in inclination to using Ibuprofen or Paracetamol.[15]

Its outcomes were reliable in that more children getting Paracetamol were afebrile somewhere in the 6hrs and 8hrs range than in the placebo group. However, the multifaceted nature of using two prescriptions over a 24hrs time frame is bound to prompt incidentally surpassing the most extreme prescribed portion and, on the other hand, the less complex thrice-every-day dosing of Ibuprofen may add to its predominance over Paracetamol. Regardless of how dosages are resolved, we accept that to limit accidentally exceeding the most extreme suggested dose, numerous clear outlines for parents to record when and how much medicines have been given should be provided with all medications.[16,17]

We agreed with the fever rules of NICE that antipyretics ought to be utilized just when participants have fever related with different indications. However, further research is expected to build up the adequacy of antipyretics for alleviating these side effects. In any case, the direction regarding the use of two medications need not be so wary now that there is great proof of prevalence for two drugs more than one for expanding time without fever more than 24 hours.[18]

Additionally, more research work is required for the system's dose-by-weight schedule to be used securely. For example, studies ought to research the portion ramifications of contrasts between evaluations of childrens' weights estimated by parents using local scales (or, as of late recorded weights in parent-held children' health records) and those deliberate by experts using pediatric scales.

CONCLUSION

Doctors, attendants and guardians wishing to use medications to treat children suffering from fever should be encouraged to use Ibuprofen first and to consider the relative risks and advantages of using Ibuprofen in addition to Paracetamol or possibly one. Comparatively, Ibuprofen is more effective than Paracetamol.

Conflict of Interest: None

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SS & UNK: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

NA & AA: Conception, drafting the manuscript, approval of the final version to be published.

MAS & AQS: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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