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A COMPARISON OF AGE-BANDED AND WEIGHT-BASED ORAL PARACETAMOL DOSING IN HOSPITALISED CHILDREN

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Introduction

The British National Formulary for Children contains two dosing strategies for oral paracetamol; age-banded dosing for pain and pyrexia or weight-based dosing for post-operative pain.[1] Only weight-based is used in our hospital. The aim of this study was to compare these dosing strategies using weights from a paediatric inpatient population.

Methods

A single-centre retrospective analysis of 4 years data (to 23.03.2020) was undertaken in a tertiary paediatric hospital. Data collected from the electronic patient record included age, height, weight and gender. These measurements were linked to information on admission and procedure and to drug prescription records. Patients 3 months to 18 years were included. Automated data cleaning was performed. Multiple measurements were allowed for individual patients, but only one measurement per admission or procedure. The hospital patient data was compared to the Health Survey England (HSE) and National Child Measurement Programme (NCMP).[2,3]

Results

Of 181835 admissions it was possible to match weight to 115466 (in 58360 patients) and height to 18822 (4906 patients). 95787 paracetamol prescriptions were identified. Doses <10mg/kg occurred in 5461 (5.7%) prescriptions and doses >20mg/kg in 691 (0.72%) prescriptions. Of the doses <10mg/kg, 1003 were in patients with a weight >66.7 Kg. In contrast, applying age-banded doses for this population would result in doses <10 mg/kg in 20748 (18%) admissions (13111 patients) and doses >20 mg/kg would occur in 4420 (3.8%) admissions (2054 patients), most commonly in teenagers (Figure 1). Weight-based dosing, with a maximum dose of 1g, would lead to doses less than 10mg/kg in 931 (0.8%) admissions (395 patients).

Discussion and Conclusion

The potential for inadequate or excessive paracetamol dosing is greater with age-banded doses compared with weight-based doses in hospitalised children. Compared to NCMP and HSE data, obesity (defined as a BMI >95th centile) is more common in hospitalised children across all age ranges. Compared to NCMP data, underweight (BMI <2nd centile) is more common in reception aged hospitalised children but not in year 6. Therefore, atypical body weights are more common in hospitalised children than the general population. A higher proportion of low body weight is seen in young children and teenagers. As a result, age-banded dosing should not be used in hospitalised children.

Our findings, using opportunistic retrospective data retrieval, are in broad agreement with data from prospective observation studies (PEACHY).[4] These methods of data collection are complementary;

the larger retrospective dataset allows more complex subgroup analysis whilst prospective data provides validation and collection of specific data points.

References:

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4. Burton ZA, Lewis R, Bennett T, McLernon DJ, Engelhardt T, Brooks PB, et al. Prevalence of PErioperAtive CHildhood obesitY in children undergoing general anaesthesia in the UK: a prospective, multicentre, observational cohort study. British Journal of Anaesthesia 2021;127:953–61. https://doi.org/10.1016/j.bja.2021.07.034.