

PEri-operAtive CHildhood obesity (PEACHY): Bristol Royal Hospital for Children (BRHC) Sub-Analysis

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Introduction

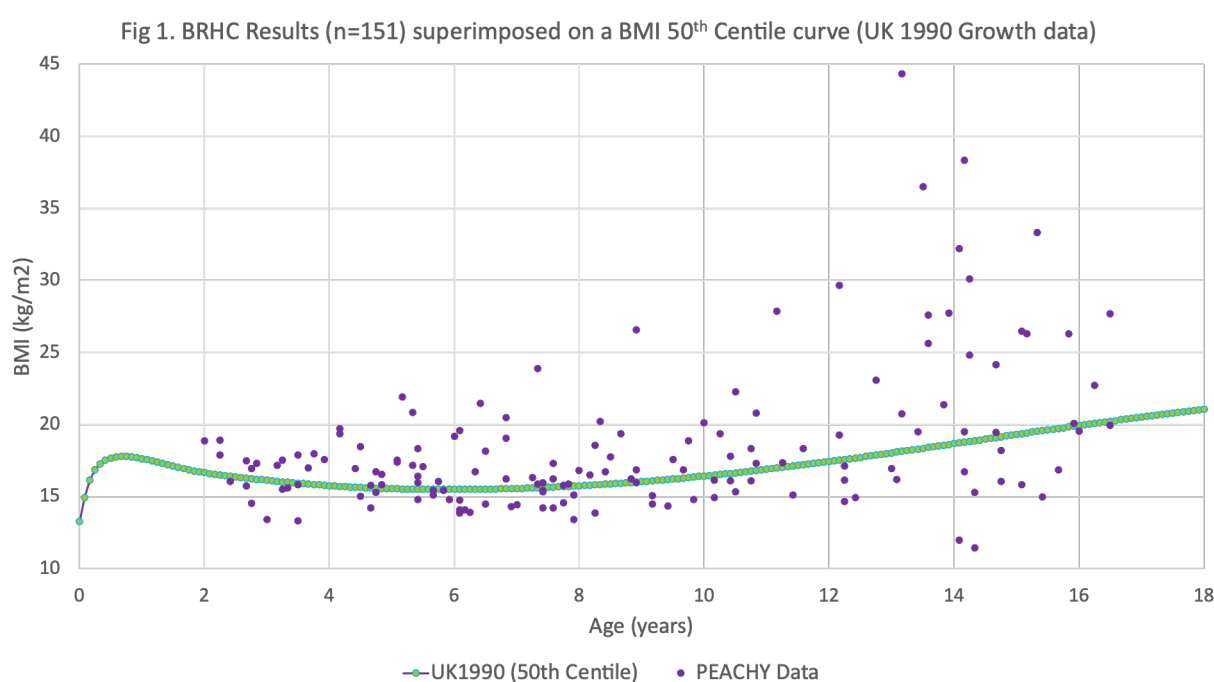
- Little is known about the prevalence of obesity in children undergoing general anaesthesia (GA) in the United Kingdom.
- Childhood obesity is associated with comorbidities (e.g. obstructive sleep apnoea) predictive of perioperative airway complications⁽¹⁾ and may be a risk factor for inadequate analgesia and dosing errors.
- The PEri-operAtive CHildhood obesity (PEACHY) study conducted in 2019 was a prospective observational multi-centre cohort study in the United Kingdom (UK) aiming to
 1. report the prevalence of obesity
 2. quantify the risk of adverse peri-operative respiratory events
 3. assess variation in perioperative paracetamol dosing
- We analysed data collected at Bristol Royal Hospital for Children (BRHC).

Methods

- We recorded the age, weight and height of consecutive children aged 2-16 years attending BRHC for a procedure under GA during a 1-week period in September 2019.
- We recorded ventilatory difficulty, laryngoscopy grade and occurrence of adverse peri-operative respiratory events.
- Using child growth data from the UK published in 1990⁽²⁾ we determined Body Mass Index (BMI) centiles for each child.
- We used the following UK National Child Measurement Programme (NCMP)⁽³⁾ weight categories:
 - under-weight (<2nd centile)
 - healthy-weight (2nd-85th centile)
 - over-weight (85-95th centile)
 - obese (95-99.6th centile)
 - severely obese (>99.6th centile)

Results

- In total 151 anaesthetic events were analysed. Figure 1 shows the BMIs of the BRHC cohort superimposed on a BMI 50th Centile curve.
- The proportion of obese and severely obese children increased with age as shown in figure 2.
- Severe obesity was more prevalent in males vs females at School Age (12% vs 4%) and Adolescence (19% vs 17%) as shown in figure 3.
- Those with obesity or severe obesity had a higher incidence of airway difficulty or adverse perioperative respiratory events (**Relative Risk 4.84**, 95%CI: 1.38 to 16.96; p= 0.014).
- Using *lean* body-weight or *adjusted* body-weight as weight descriptors (as recommended⁽⁴⁾) we identified a small number of outliers receiving supramaximal paracetamol doses of (defined as >20mg/kg) (figure 4).



Ethics:

The PEACHY study had Health Research Authority (HRA) and Research Ethics Committee (REC) approval as a non-consenting study (Ref: 18/WM/0394)

Acknowledgements:

PEACHY was a National Institute for Health Research (NIHR) portfolio study lead by the Paediatric Anaesthetic Trainee Research Network (PATRN) as their 2018-19 national project and supported by the APAGBI Scientific Committee. University Hospital Southampton was the project lead site. This poster was possible thanks to the work of the entire anaesthetic and theatres staff at Bristol Royal Hospital for Children

Fig. 2. The proportion of children in each weight category for three age groups

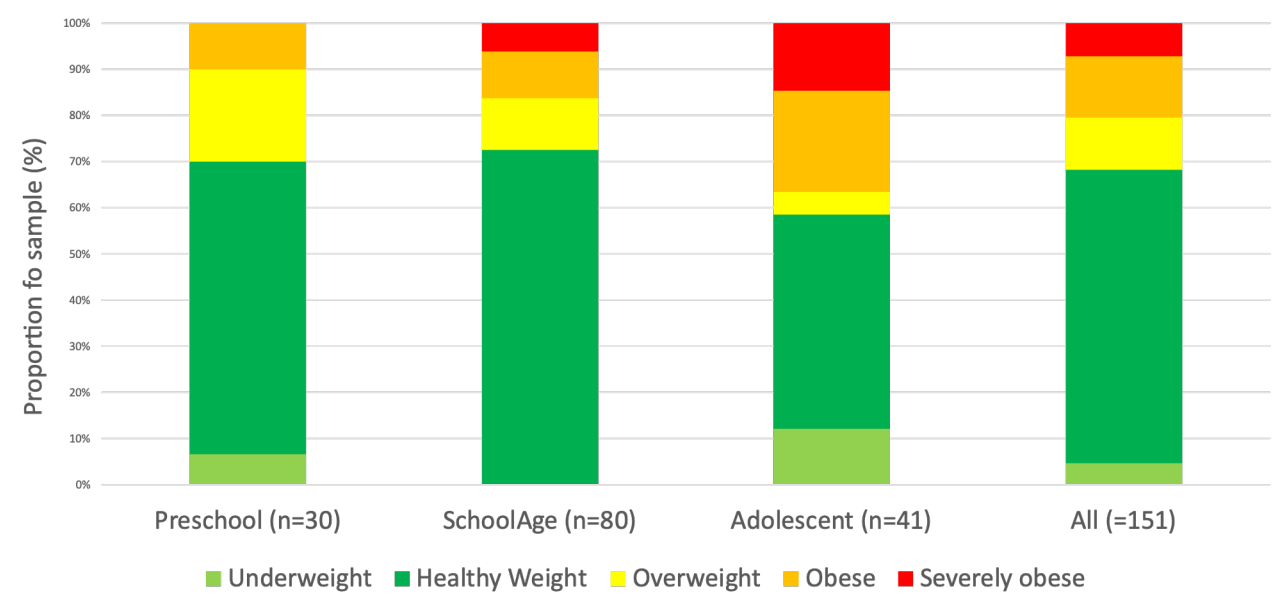


Fig.3. The Prevalence of Overweight, Obese & Severely Obese Children by Age Group and Gender (blue = male, pink = female) (n=151)

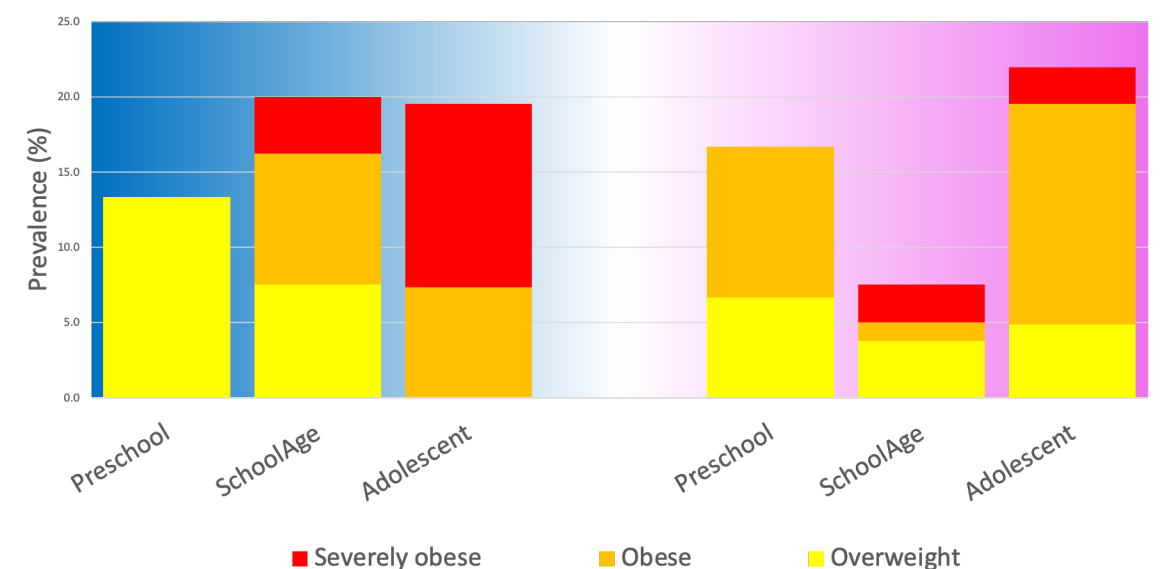
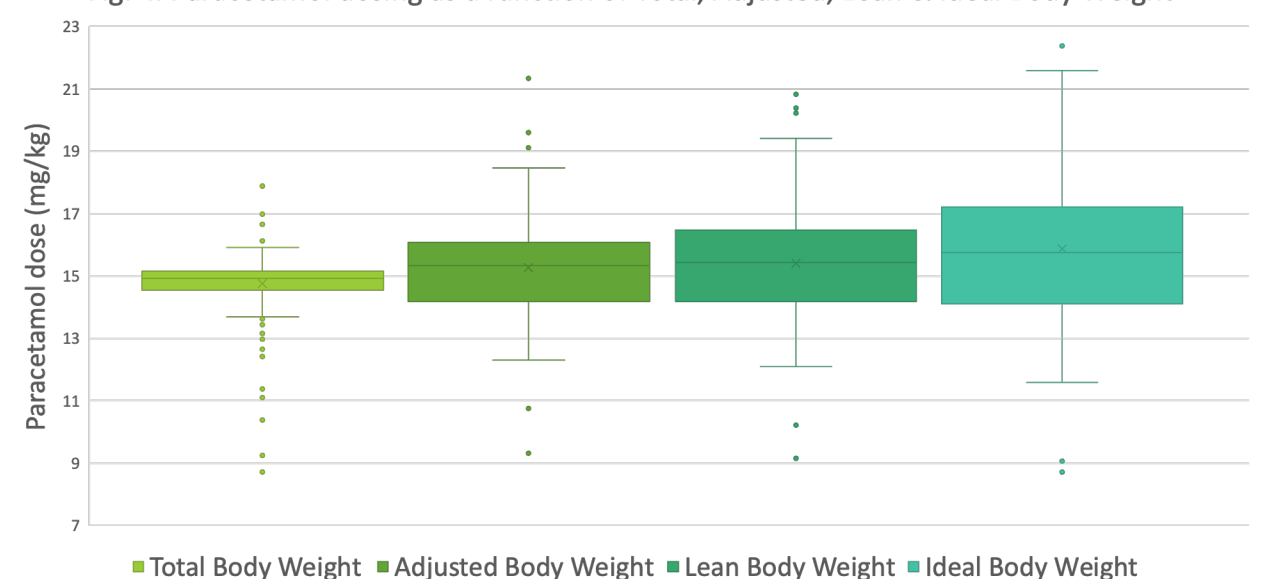


Fig. 4. Paracetamol dosing as a function of Total, Adjusted, Lean & Ideal Body Weight



Discussion

- This study highlights a relatively high prevalence of severe obesity in male adolescents attending our institution for procedures requiring GA.
- We identify a BMI >95th centile as a risk factor for airway difficulty or an adverse perioperative respiratory event.
- Retrospective analysis of paracetamol dosing suggests those with a very high BMI centile may have received supramaximal doses.

References

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