

[A-17] Endotracheal tube (ETT) sizing and ETT exchange rate for paediatric intubations under general anaesthesia (GA)

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A correctly sized ETT not only prevents the need for re-intubation attempts, it also limits post-intubation airway trauma. Studies have shown that the use of cuffed ETT (cETT) reduces the rate of ETT exchange (1,2). Yet, the use of cETTs in children remains controversial, with higher costs and lack of cuff pressure monitoring undermining its routine and safe use in children.(3) A variety of formulas exist to guide the choice of ETT in children. A myriad of ETTs brands with differing external diameters further complicate the picture.(5,6)

We seek to find out the incidence of ETT exchanges due to wrong sizing amongst paediatric anaesthetists and if it is affected by other factors eg. type of formulae used.

This observational study took place in 2 pediatric tertiary centers (UK and Singapore). The aim was to audit and compare the factors that determine the choice and size of ETT used for children undergoing general anaesthesia and the rate of ETT exchanges due to inaccurate ETT sizing.

After hospital ethics approval, patients requiring intubations for elective and emergency procedures, except premature infants and/or those <3 kg, were audited. Patient demographics, co-morbidities, factors governing the choice (size and type) of ETT, were prospectively collected on a standard data form. ETT exchanges due to poor fit were noted and correlated to the type of ETT used.

A total of 428 intubations (43% UK, 57% Singapore) were audited. Mean age was 6.1 yrs (SD 4.9), weight 24.6 kg (SD 20.1). ETT selection was by the paediatric anaesthetist in 47.7% of cases, whereas 22.7% by the anesthetic nurse (mainly in the UK). cETTs were chosen at the first instance in 41.6%, uncuffed ETTs in 55.6%. The formula  $\text{Age}/4+4.5$  was most commonly used (38.2%) to guide the sizing of uncuffed ETT, whereas 'experience' was considered most important (46.1%) in guiding the choice of cuffed ETT. Mean age of patients intubated with cETTs was significantly older than those intubated with uncuffed ETTs (mean age 10.4, SD 4.03, cf 3.0, SD 2.71,  $p < 0.05$  CI 6.70-8.01). Median size of cETTs and uncuffed ETTs used were 6 (range 4.5) and 5 (range 4.5-8.6) respectively. Intubation was successful on first attempt in 76.9% of the cases. Of the unsuccessful ones, 47.7% was too large, 52.3% was too small leading to significant leak.

Overall, the rate of successful first-attempt intubation was higher with cETTs compared to uncuffed ETTs (84.1% vs 73.9%,  $p=0.13$ ). However, the difference was not significant when the cases were analysed separately in each institution ie. Singapore: 83.5% success with cETTs vs 80% with uncuffed ETTs ,  $p=0.496$ ). Formulae ( $\text{Age}/4 +4.5$ ) was used more frequently to size uncuffed ETTs by the anaesthetists in Singapore than those in the UK. (48.2% cf 27.9%)

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