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Title:

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Date:

2020-12-01

Citation:

Butters, C. & Clifford, V. (2020). RATIONAL USE OF ANTIBIOTICS IN VENTILATED NEONATES WITH BACTERIAL COLONISATION OF THE ENDOTRACHEAL TUBE. *Journal of Paediatrics and Child Health*, 56 (12), pp.1999-2000. <https://doi.org/10.1111/jpc.15274>.

Persistent Link:

<https://hdl.handle.net/11343/276674>

Rational use of antibiotics in ventilated neonates with bacterial colonisation of the endotracheal tube

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Article type: Letter to the editor

Contributors' Statement Page

Dr Butters drafted the initial manuscript, reviewed and revised the manuscript.

Dr Clifford reviewed and revised the manuscript.

Funding Source: No funding was secured for this study.

Conflict of Interest: The authors have no conflicts of interest to disclose.

as doi: [10.1111/jpc.15274](https://doi.org/10.1111/jpc.15274)

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We read with interest the article by Antoine *et al.*¹, reporting on a single-centre retrospective study of endotracheal tube (ETT) bacterial colonisation in intubated newborns < 32 weeks gestation. Although the study provides useful data to inform future research, we caution against antibiotic treatment of asymptomatic neonates with ETT bacterial colonisation. Antoine *et al.* confirm the findings of previous studies that at least two thirds of intubated neonates have ETT bacterial colonisation, often starting within the first week of life. While 35% had colonisation with ‘significant bacteria’ (Gram negatives, *Staphylococcus aureus* and Group B streptococcus) and this was positively associated with sepsis, the interpretation of cultures of ETT aspirates is challenging and there is no consensus in the literature regarding which bacteria are clinically significant. Given that only 19% of neonates with significant bacterial growth developed sepsis, prophylactic treatment of ETT colonisation would result in a large number of intubated pre-term neonates unnecessarily receiving broad-spectrum antibiotics.¹

Pre-term infants already have high rates of antibiotic exposure, with antibiotics being the most commonly used class of medication in the neonatal intensive care.² The potential benefits of treating colonising organisms must be balanced against the risks of antibiotic-associated harm. Early adverse effects of antibiotics include increased rates of necrotising enterocolitis, higher risk of invasive fungal infections and antibiotic pressure driving antibiotic-resistant bacterial infections. Antibiotics also modify the neonatal microbiome and developing immune system which may potentiate a range of late effects such as obesity, inflammatory bowel disease and allergy.³ Furthermore, in a recent study of ventilated pre-term neonates, antibiotic treatment only transiently changed the diversity and quantity of airway bacteria and had no impact on indirect measures of pulmonary inflammation.⁴

As current scientific evidence does not support treatment of bacterial ETT colonisation, emphasis should be given to measures shown to improve neonatal morbidity and mortality such as systematic neonatal care, minimising invasive ventilation and judicious treatment of proven infection. The decision to treat ETT colonisation in neonates should ultimately be informed by an adequately designed randomised, controlled trial.

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