Black children in UK have four times the risk of complications after emergency appendicitis surgery as white children

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New research published in *Anaesthesia* shows that for children undergoing emergency surgery for appendicitis in the UK, the risk of

postoperative complications in Black children was four times greater than that of white children.

The study was led by Dr. Amaki Sogbodjor, from Great Ormond Street Hospital and University College London (UCL), and Professor Ramani Moonesinghe, UCL Division of Surgery and Interventional Science, London, UK and Director, Central London National Institute for Health Research Patient Safety Research Collaboration, London, UK. The study was managed by the Centre for Research and Improvement at the Royal College of Anaesthetists.

Appendicectomy (removal of the appendix) is a common procedure in children (10,000 operations annually in England) with a low risk of mortality. However, complication rates and risk factors are largely unknown. This study aimed to characterize the incidence and epidemiology of postoperative complications in children undergoing appendicectomy in the UK.

This multicenter prospective observational cohort study included children aged 1–16 years who underwent surgery for suspected appendicitis, and was conducted between November 2019 and January 2022. The primary outcome was to assess the incidence of postoperative complications within 30 days of surgery.

Data from 2,799 children recruited from 80 hospitals across the UK were analyzed, of whom 185 (7%) developed postoperative complications. The majority of complications were infective and treated with antibiotics. Of these, 75% were related to the wound and 25% either respiratory, urinary, catheter-line-related or of unknown origin. Black children were at significantly higher risk of poor outcomes, with a four-fold greater risk for postoperative complications. This finding was independent of socioeconomic status and the type of appendicitis found on histology.

Other risk factors for complications included pre-existing medical conditions (with American Society of Anesthesiology [ASA] physical status of 3 or higher leading to a four times greater risk of complications compared with ASA 1-2), and markers of severity of illness, including body temperature of 38°C or higher (77% increased risk compared to normal body temperature of 37°C or less) and requiring oxygen supplementation during surgery (four times increased risk).

Professor Moonesinghe said, "In the UK NHS, which is a universally accessible health care system, ethnicity, but not socioeconomic status, was associated with an increased risk of postoperative complications in children having surgery for acute appendicitis. Further evaluations and interventions are required to address this health inequality in keeping with NHS and international priorities."

This is the first study to report different complication rates in this type of surgery in children in UK; looking at studies from the U.S., there is substantial evidence to suggest that Black children have higher rates of complicated appendicitis, and it has been suggested that this may in part be related to delays in diagnoses. However, in this UK study, ethnicity remained a risk factor after adjusting for whether the child had simple or complicated appendicitis.

Dr. Sogbodjor explains, "Children with acute appendicitis constitute a particularly useful cohort in which to review the impact of ethnicity on health and health care outcomes, due the similarity of the clinical condition—all children present with the same suspected pathology. The 'free at the point of delivery´ NHS health care model should reduce the impact of inequitable access to health care, which may partly explain differential outcomes in other health systems. However, while access to services may be universally available, the utilization and delivery of services may still differ. A review of the processes of care is needed to understand whether the quality of care provided is comparable for all."

The authors explain that the study took place across the COVID pandemic that could have interrupted service delivery and provision differently in different areas of the UK and conceivably influenced the results.

Regarding potential limitations to the study, the authors note that there is evidence to suggest Black children in the UK present less frequently with appendicitis than white children. For practical and pragmatic reasons, the did not include children whose parents were unable to speak or understand English sufficiently to provide informed consent to participate. It is possible that this introduces some bias into the cohort and findings, particularly as this cohort of patients may be vulnerable to poor experiences of health care due to marginalization resulting from difficulties with communication.

Furthermore, the data included in the study did not include weight, height or body mass index in the final dataset as a review of data quality after the first 800 patients were recruited indicated that these data were recorded poorly where these children were treated.

The authors conclude, "Acute appendicitis is a common condition in children, causing morbidity at scale. In the NHS, Black children had a significantly higher risk of postoperative morbidity than other children, even after adjusting for household socioeconomic status, acute physiology and long-term health. This health inequality requires urgent further investigation, and development of interventions aimed at resolution."

More information: F. C. Oglesby et al, Peri-operative cardiac arrest in children as reported to the 7th National Audit Project of the Royal College of Anaesthetists, *Anaesthesia* (2024). DOI: 10.1111/anae.16251

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