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Emergency surgery death risk up to 7 times higher for kids in low income countries

For abdominal procedures, gap in outcomes between rich and poor nations is wide

The likelihood of dying after emergency abdominal surgery to treat conditions such as appendicitis, may be up to seven times greater for a child in a poor country than for a child in a rich nation, suggests research published in the online journal **BMJ Global Health**.

Given the recent decision to recognise surgery as an essential element of healthcare, globally, a concerted effort needs to be made to close this gap, say the researchers.

Emergency surgery generally carries a higher risk of complications than planned surgery, but it's not clear what the magnitude of this risk might be among children or whether it is affected by where they happen to live.

To quantify a child's chances of developing complications and of survival after emergency abdominal surgery—a relatively common procedure worldwide—the researchers formed a unique global collaboration of surgeons to assess the outcomes of 1409 children from 253 centres in 43 countries over a two week period between July and December 2014.

They looked particularly at the risks of dying within 30 days of the procedure, and of developing postoperative complications or wound (surgical site) infections.

Almost half of the children (49%; 694) were from developed countries, while around a third (32%; 450) were from middle income countries, with the remainder (19%; 265) from poor countries.

The most common prompt for emergency surgery was appendicitis; followed by congenital abnormalities, rates of which were higher among children from poor countries; intussusception (intestinal blockage); and hernia.

One in five (282) of the children was under 2 years old when the operation was carried out, making them more vulnerable to complications.

And more children from poor countries were classified as higher risk cases to begin with than those from middle income or rich nations.

But children from poorer nations were further disadvantaged.

They were much less likely to have undergone keyhole surgery, which minimises the risk of complications and speeds up recovery; half as likely to have been operated on by surgeons who used the World Health Organization surgical safety checklist; and more likely to have had internal bleeding (a perforated viscus).

But even after accounting for these factors, children from poor nations were significantly more likely to die after their procedure than were those from middle income and rich nations.

Children from middle income countries were around 4 times as likely to die within 30 days as those from rich nations, while children from poor countries were 7 times as likely to do so.

These rates are considerably higher than the threefold higher risk of death reported among adults in low income countries and account for an extra 40 deaths for every 1000 procedures in low and middle countries compared with rich nations in this study alone, the researchers point out.

Rates of serious complications were also nearly twice as high among children from poor countries: 11.3% compared with just over 6% for children from middle income and rich nations.

And rates of wound infection were around five times as high among children from poor nations, accounting for around one in five (21%) cases, compared with around one in 10 (9.6%) in middle income countries and around one in 20 (4.6%) in rich nations.

The researchers emphasise that they were not able to look at other influential factors, such as staffing levels and treatment delays, added to which, the sample of hospitals, which selected themselves, may not reflect the experience of other more poorly resourced centres, so potentially underestimating the number of unfavourable outcomes.

Nevertheless, they call for surgical services for children in poor countries to be improved.

“Good surgical outcomes require a multitude of factors, including trained personnel, good facilities and surgical supplies, as well a prompt access to surgical care,” they write.

No one focus will suffice, they say. That includes “well-meaning efforts from high income countries...in the form of ‘surgical safaris’ by visiting surgical teams, the provision of surgical equipment alone, or short term training courses outside one’s normal work setting,” they suggest.

The recent global recognition of surgery as an essential healthcare component has provided a unique impetus for provision of essential surgical services, especially in low and middle income countries,” they conclude. But they warn: “The task ahead is a huge one, in terms of access to, and quality of, care.”

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Notes for editors

Research: Determinants of morbidity and mortality following emergency abdominal surgery in children in low-income and middle-income countries

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