

Preventative antibiotics after assisted childbirth almost halve maternal infection rate and reduce overall antibiotic use

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Baby on mother's belly right after birth. Credit: Tom Adriaenssen/Wikipedia, CC BY-SA 2.0

Giving a single dose of preventative antibiotics to all women after childbirth involving forceps or vacuum extraction could prevent almost half of maternal infections including sepsis—equivalent to over 7,000 maternal infections every year in the UK, and around 5,000 in the USA.

The first randomised trial of its kind in the UK involving 3,420 women from 27 obstetric units, published in *The Lancet*, also found that for every additional 100 doses of antibiotic given prophylactically, 168 doses could be avoided due to fewer postdelivery infections—meaning that a policy of universal prophylaxis after [birth](#) could help to reduce [antibiotic use](#) by 17%.

Infection rates after assisted vaginal birth without antibiotic prophylaxis are around 16% worldwide, and up to 25% after [caesarean section](#). In 2016, an estimated 19,500 women died because of pregnancy-related infections globally. Even in high-income settings, infections account for 1 in 20 maternal deaths, and as many as 1 in 8 in the USA. For every woman who dies from pregnancy-related infection, another 70 women develop a severe infection and survive often with long-term health consequences.

"These findings highlight the urgent need to change current WHO antibiotic guidelines and other guidance from organisations in the UK, North America, and Australasia, that do not recommend routine antibiotic prophylaxis for assisted childbirth," says Professor Marian Knight from the University of Oxford, UK, who led the research.

"Pregnancy-associated infection is a major cause of death and serious illness. Almost 1 in 5 women develop an infection after assisted [vaginal delivery](#) and our results show that this could be reduced by almost half by a single dose of prophylactic antibiotic."

A recent Cochrane review of 95 trials showed that giving [antibiotics](#) before caesarean section reduced wound infection, endometritis, and serious maternal infection by 60-70%, and the use of antibiotics during caesarean section is widely recommended. In contrast, evidence on the use of prophylactic antibiotics in assisted vaginal birth is limited to a small trial of 393 women.

To provide more evidence, the new study investigated whether a single dose of antibiotics prevented maternal infection in the 6 weeks after assisted [vaginal birth](#) in 3,420 women (aged 16 years and older) giving birth in 27 hospital obstetric units across the UK.

Between March 2016 and June 2018, women were randomly assigned to receive intravenous amoxicillin and clavulanic acid (1,715 women) or placebo (saline; 1,705) within 6 hours of operative vaginal delivery. The researchers also assessed the effect of using prophylaxis on overall antibiotic use. Suspected or confirmed maternal infection within 6 weeks of giving birth was identified by a new prescription for antibiotics, confirmed systemic infection on culture, or endometritis.

Overall, around two-thirds of babies were delivered by forceps and about a third by vacuum extraction. Data were missing for 195 (6%) of women who were not included in primary outcome analyses.

Results suggested that women who received a single dose of antibiotics had significantly fewer suspected or confirmed infections than women given placebo (180/1,619; 11% vs 306/1,606; 19%).

Importantly, women receiving [antibiotic prophylaxis](#) were also much less likely to have confirmed culture-proven sepsis compared to those receiving placebo (56% reduction—11/1,619; 0.6% vs 25/1,606; 1.5%).

Rates of perineal wound infection or breakdown (burst stitches), perineal pain, use of pain relief for perineal pain, and need for additional perineal care were also substantially lower in the group who received antibiotics compared to the [placebo group](#). Additionally, women who received antibiotics were much less likely to report any GP, nurse, or midwife home visits, or hospital outpatient visits due to their wound healing compared to the placebo group (table 3).

The researchers estimate that the total average NHS costs 6 weeks after birth were £52.60 less per women in those who received the single dose of antibiotic compared to women given placebo (£102.50 vs £155.10; appendix table S8).

One woman in the placebo group reported a skin rash and two women in the antibiotic group reported other allergic reactions, one of which was reported as a serious adverse. Two other serious adverse events were reported, neither was considered related to the treatment.

"With increasing recognition of the need to reduce unnecessary caesarean births, the incentive to minimise the harms associated with other types of assisted delivery are even greater," says Professor Knight. "This simple intervention could also be used to prevent maternal infections in low- and middle-income countries in which intravenous antibiotics are available."

The authors note several limitations, including that presumed rather than culture-proven infection was the primary outcome, and that only three-quarters of women were followed up for secondary outcomes, both of which could have influenced the results. They also point out that despite being given antibiotics, 1 in 10 women still had a suspected or confirmed infection, highlighting the importance of more studies to investigate the mechanism of action and whether earlier administration, prenatal administration, or repeated administration is likely to be more effective. Finally, it is unclear whether oral prophylactic antibiotics would have the same preventative efficacy.

Commenting on the implications of the findings in a linked Comment, Dr. Vincenzo Berghella from Thomas Jefferson University, USA, says the ANODE study is "practice changing" and writes: "Even if one conservatively estimates 2% of babies are born by operative vaginal delivery globally, about 2,700,000 of the world's 135 million annual

births are operative vaginal deliveries. Up to 16% of these births can be associated with [infection](#) without antibiotics prophylaxis, representing about 432,000 annual infections associated with operative vaginal delivery worldwide...Clinical guidelines should be updated to reflect the new recommendation of giving a single dose of intravenous amoxicillin and clavulanic acid within 6 h after operative vaginal delivery, in particular to [women](#) who also have an episiotomy."

More information: Marian Knight et al, Prophylactic antibiotics in the prevention of infection after operative vaginal delivery (ANODE): a multicentre randomised controlled trial, *The Lancet* (2019). [DOI: 10.1016/S0140-6736\(19\)30773-1](#)

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