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Is antibiotic prophylaxis effective or safe for women undergoing operative vaginal delivery?

Vaginal cleansing with antiseptic solution before cesarean delivery to reduce infections after surgery

Is antibiotic prophylaxis effective or safe for women undergoing operative vaginal delivery?

Authors: Liabsuetrakul T, Choobun T, Peeyananjarassri K, Islam Q

We set out to assess from randomised controlled studies whether giving antibiotics to all women undergoing operative vaginal deliveries prevents infections in the mother without increasing adverse outcomes in the mother and baby. Vacuum extraction or forceps are used to deliver the baby's head in operative vaginal deliveries.

What is the issue?

Women who undergo vacuum- or forceps-assisted vaginal births may be more likely to have an infection after the birth when compared to women who experience a normal spontaneous vaginal birth. They are also more likely to be re-admitted to hospital. Women are at increased risk of infection because of the need for routine bladder catheterisation, multiple vaginal examinations, insertion of instruments into the vagina, and increased risk of vaginal deep cuts or tears during the operative birth. Infection appears as fever, infection of the uterus and surrounding tissues, an infected episiotomy or vaginal tear, or urinary tract infection. These affect the physical state of the mother and can impact on her well-being. The infection may also enter the bloodstream and affect the whole body.

Why is this important?

Vacuum extraction or forceps are used to shorten labour from the time when the cervix is fully opened to birth (second stage of labour), particularly if this is long or the baby shows signs of distress. Antibiotics can be given to mothers at the time of birth to prevent or reduce the risk of infection. However, there are still some doubts about the benefit of such antibiotics. Antibiotics can also cause adverse reactions such as rash or diarrhoea in the mother, and may be present in breast milk so that a breastfeeding baby is exposed to them.

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What evidence did we find?

We updated our search for evidence from randomised controlled studies in July 2019. We included two studies, published in 1989 and 2019. The older study was conducted in the USA and the more recent study was from a number of hospital obstetric units in the UK. A total of 3813 women undergoing operative vaginal delivery were included. The USA study involved 393 women and compared 2 g of intravenous cefotetan after cord clamping with no treatment. The other study involved 3420 women. This study compared intravenous amoxicillin and clavulanic acid with placebo. The certainty of the evidence varied from high certainty to low, with low certainty being downgraded because of concerns relating to imprecise results, with few events and only a single study reporting on a number of the findings.

Prophylactic antibiotics given to reduce or prevent infection halved the number of women with infected episiotomies or lacerations. These findings included superficial and deep perineal wound infections (one study, 3420 women; high-certainty evidence) or wound breakdown (one study, 2593 women; moderate-certainty evidence). Serious infectious complications were also reduced (one study, 3420 women; high-certainty evidence). Due to low-certainty evidence, prophylactic antibiotics had uncertain effects on endometritis, experienced as fever and uterine tenderness or heavy bleeding (two studies, 3813 women; low-certainty evidence) and infected episiotomy/laceration presenting with organ or space perineal infection (one study, 3420 women; low-certainty evidence).

The impact on maternal adverse reactions (one study, 2593 women; low-certainty evidence) and maternal length of stay in hospital (one study, 393 women; low-certainty evidence) was also unclear due to the low-certainty of the study. Perineal pain and health consequences of perineal pain were slightly reduced.

Prophylactic antibiotics did not have a clear effect on pain during sex and breastfeeding at six weeks. Maternal hospital re-admission and maternal health-related quality of life may be slightly improved. Costs were reduced with use of prophylactic antibiotics. Neither study specifically measured fever, urinary tract infection or adverse reactions in babies.

What does this mean?

Prophylactic antibiotics into a vein are effective in reducing ill-health caused by infections in women undergoing operative vaginal deliveries, and who do not have clinical indications for antibiotic administration. The evidence was mainly from a single study in a high-income country. Well-designed randomised studies in other settings are required to confirm this finding.

Vaginal cleansing with antiseptic solution before cesarean delivery to reduce infections after surgery

Authors: Haas DM, Morgan S, Contreras K, Kimball S

We set out to determine from randomized controlled trials if cleansing the vagina with an antiseptic solution before a cesarean delivery safely decreases the risk of maternal infections.

What is the issue?

Cleansing the vagina before the cesarean delivery can reduce the number of bacteria that are naturally present in the vagina. These bacteria in the vagina and cervix can move up into the uterus during the surgical procedure and cause infection in the lining of the uterus and in the surgical wound. Antibiotics are routinely given before the surgery to reduce the risk of infections, but some women still suffer from these complications. Some antibiotics do not always eradicate all bacteria, and antibiotic resistant bacteria may be present. Vaginal preparation may not be included in the care provided to women to reduce infection following surgery. Vaginal cleansing solutions, such as chlorhexidine and povidone-iodine are inexpensive, and have very few side effects.

Why is this important?

Cesarean deliveries are common, with almost one in three babies born by cesarean in some countries such as the USA. It is not uncommon for women having a cesarean delivery to develop an infection of the uterus (endometritis) or a problem with their skin incision. The risk of infection is greater if a woman's waters have broken or she is in labor before the cesarean section. These complications may slow a woman's recovery from the surgery and can affect her ability to take care of her baby. This is a Cochrane Review first published in 2010 and updated in 2012, 2014, and in 2017.

What evidence did we find?

We searched for new evidence on 7 July 2019. In this update, we have included 21 randomized controlled studies, involving a total of 7038 women undergoing cesarean section. The studies took place in 10 countries (Saudi Arabia, Pakistan, Iran, Thailand, Turkey, USA, Egypt, UK, Kenya and India). The control group had no vaginal preparation in 18 studies and in three studies participants used a saline vaginal preparation. We did not include trials that did not give antibiotics before or during the surgery, or where women received vaginal preparation during labor. Seventeen studies used povidone-iodine for vaginal cleansing, three chlorhexidine, and one benzalkonium chloride.

Cleansing the vagina with antiseptic solution immediately before cesarean delivery probably reduces the incidence of post-cesarean infection of the uterus (20 trials, 6918 women; moderate-certainty evidence). This reduction was seen for both iodine-based solutions and chlorhexidine-based solutions. The risk of postoperative fever (16 trials, 6163 women) and postoperative wound infection (18 trials, 6385 women) are also

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probably reduced by vaginal cleansing; both moderate-certainty evidence). The risk of having wound complication or infection of the uterus may be lower in women receiving preoperative vaginal cleansing with antiseptic solution (2 trials, 499 women). None of the studies reported any adverse events, such as an allergic reaction to the cleansing solution or irritation.

Further analysis suggested a greater effect for those women in labour versus those not in labour for four out of five outcomes examined (post-cesarean infection of the uterus; postoperative fever; postoperative wound infection; wound complication or infection of the uterus) but this apparent difference needs to be investigated further in future trials. We did not observe any differences between groups of women with ruptured membranes and women with intact membranes.

What does this mean?

Cleansing the vagina with povidone-iodine or chlorhexidine solution (compared to saline or not cleansing) immediately before cesarean delivery probably reduces the risk of infection of the uterus, fever, and infection of the surgical wound. Further analysis found that these benefits were typically present whether iodine-based or chlorhexidine-based solutions were used and when women were in labor before the cesarean.

Vaginal preparation is a simple and well-tolerated way to lower the chances of developing an infection after having a baby by cesarean.

If you have any questions or comments with regard to the above document please feel free to contact me.

Kind regards

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