

EDITORIALS

“Vaginal seeding” of infants born by caesarean section

How should health professionals engage with this increasingly popular but unproved practice?

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The microbiota is the community of microbes that colonises our bodies, outnumbering our own cells 10 to 1.¹ This complex microbial community varies from one part of the body to another, and from one person to another. Characteristic differences in the microbiota are associated with various diseases.² As a result interest has surged in the potential for manipulating the microbiota to promote health and treat disease.² The term “vaginal seeding” describes the use of a gauze swab to transfer maternal vaginal fluid, and hence vaginal microbiota, on to an infant born by caesarean section.³⁻⁴ The composition of the early microbiota of infants is heavily influenced by mode of delivery.⁴ In infants born by caesarean section the microbiota resembles that of maternal skin, whereas in vaginally born infants it resembles that of the maternal vagina.⁴⁻⁵

These early differences in the microbiota have been suggested to determine susceptibility to an increasing number of common non-communicable diseases.²⁻⁶ In theory, vaginal seeding might restore the microbiota of infants born by caesarean section to a more “natural” state and decrease the risk of disease.⁴ The potential benefits of vaginal seeding have recently been reported in the press³⁻⁸ and, as a result, demand has increased among women attending our hospitals. Demand has outstripped both professional awareness and professional guidance on this practice.

What the evidence says

In many countries more than a quarter of babies are now delivered by caesarean section.⁴ Large epidemiological studies and systematic reviews have shown that delivery by caesarean section is associated with a modest increase in the risk of obesity, asthma, and autoimmune diseases.⁴⁻¹⁰ These same diseases are also associated with alterations in the microbiota.⁴⁻¹¹ Furthermore, mode of delivery has been reported to influence the development of immune responses that might predispose to allergic and autoimmune disease.⁶

In animals the early life microbiota has been shown to influence the developing immune system, and altering the microbiota can cause or prevent disease.⁶⁻¹² Evidence is accumulating that the human microbiota can also be manipulated to benefit health,² but not (yet) that vaginal seeding is beneficial to the infant. Indeed, such evidence will be difficult to gather, requiring large clinical trials with many years of follow-up. It might seem reasonable to perform this simple and cheap procedure, even without clear evidence of benefit, but only if we can be sure that it is safe.

We lack that certainty at present. Newborns may develop severe infections from exposure to vaginal commensals and pathogens, which the mother may carry asymptotically. These include group B streptococcus (the most common cause of neonatal sepsis), herpes simplex virus, *Chlamydia trachomatis*, and *Neisseria gonorrhoeae* (the last two, causes of ophthalmia neonatorum). These pathogens would probably also be transferred on a vaginal swab, potentially abrogating the protection from infection afforded by elective caesarean section.

We are aware of only one current clinical trial investigating vaginal seeding (ClinicalTrials.gov NCT02407184), but the primary outcome is alteration of the neonatal microbiota rather than a clinical outcome and it excludes women with vaginal carriage of potential pathogens. Many countries (including the United Kingdom and Australia) do not screen all women for these pathogens in pregnancy, and with 20-30% of pregnant women carrying group B streptococcus, vaginal seeding could result in many unintended neonatal exposures. We have already needed to intervene to prevent vaginal seeding from a woman with genital herpes, and we expect trouble if the procedure gains wide popularity.

Minimising risk

In the absence of evidence of benefit, or of guidelines to ensure the procedure is safe, how should health professionals engage

with the increasing demand for vaginal seeding? We have advised staff at our hospitals not to perform vaginal seeding because we believe the small risk of harm cannot be justified without evidence of benefit. However, the simplicity of vaginal seeding means that mothers can easily do it themselves. Under these circumstances we should respect their autonomy but ensure that they are fully informed about the theoretical risks.

Parents should be advised to mention that they performed vaginal seeding if their baby becomes unwell because this may influence a clinician's assessment of the risk of serious infection. Health professionals should be aware that vaginal seeding is increasingly common and ask about it when assessing neonates who may have an infection. Parents and health professionals should also remember that other events in early life, such as breast feeding and antibiotic exposure, have a powerful effect on the developing microbiota.²⁻⁷ Encouraging breast feeding and avoiding unnecessary antibiotics may be much more important than worrying about transferring vaginal fluid on a swab.

Pull quote: Newborns may develop severe infections from exposure to vaginal commensals and pathogens

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