

Bugs, babies and bumps

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During the last year viral infections have certainly increased everybody's awareness, but has the pandemic reminded us about the importance of mother-to-child-transmission (MTCT) of bacterial and viral infections and of all that really protects us from pathogens? Even though significant prophylaxis and therapeutic advances have been made, MTCT control remains of great importance in preventing pregnancy outcome complications.

Many infections can be acquired through vertical transmission, among which HIV-1 has benefitted from most of scientists' attention. However, bacterial infections can be easily transmitted during labour, changing the starting point of a newborn's life and influencing baby's colonization with commensal strains. For instance, although rare, *Mycobacterium tuberculosis* transplacental transmission is possible and can become fatal if left untreated. The mortality rate can rise up to 50%, due to the difficulty of a prompt diagnosis. The role of tuberculosis (TB) in vertical transmission of other pathogens is not well established yet, but data indicates that TB diagnosis and treatment should be a priority in HIV/TB coinfecting women, in order to decrease the risk of HIV MTCT.¹

In case of HIV-1 it is still unknown whether it is timing of ART initiation and its long-term effects, bacterial vaginosis (BV) or the virus itself that triggers pre-term birth or if that is a consequence of the interplay between host's immune system and external factors, such as immune reconstitution by ART. Baby steps have been taken on the cervicovaginal microbiota puzzle, as we have only started to understand its composition, and influence on the host-pathogen interaction. Despite the fact that cervicovaginal fluid (CVF) is mostly understudied in HIV pre-term birth (PTB), there is evidence considering its excellent potential to give answers to important questions. For example, existing data shows that healthy pregnant women have a *Lactobacillus* spp. (i.e. *L. crispatus*, *L. iners*) enriched genital microbiota which seems to play a key role in pregnancy success.²

Apart from pathogenic infections, beneficial microbial components are being transmitted from

mothers to their children as well, to be utilized as a strong weapon to counteract infectious disease and inflammatory conditions during lifetime.

It is hypothesized that intestinal microbiota of the infant might be inherited from the mother's gut microflora, due to the increased amount of detected identical strains, and ongoing studies indicating the influence of maternal microbiota in the seeding of infant's bacterial colonization as fundamental factor in future inflammatory disease risk. Moreover, studies have demonstrated that while over 60% of the baby's bacterial microbiome is inherited from the mother, only 15% of the virome is acquired through mother-to-child-transmission.³

Even though the neonate microbiome is different by nature from the cervico-vaginal microbiome, early colonization is influenced by genetic factors, antibiotic and antiviral exposure, as well as by a variety of other environmental stimuli.

Elucidating inheritance and establishment of microbiota may be a great starting point in the life of a newborn and lead to a spring of precious knowledge. Ultimately, it can bloom and turn into a very useful tool for the development of personalized prophylaxis against serious illnesses, including infectious diseases.

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