



## Micro Birthing

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“Where some good little thing that you have done may bring results years later that you never Dreamed of,” - Pete Seeger.

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### Abstract

The infant's immunity stays immature for first few months of life, during this period the antibodies transferred via the mother will stay active and protects the baby from getting infections. Good bacteria in our gut help for immune system to work well.

During vaginal birth the maternal gut bacteria presents in mother's vagina transferred in to baby mouth and reaches the baby's gut and helps the immune system to work well. These antibodies are essential until baby makes its own antibodies. Baby born through

C -Section break up the process of transferring maternal gut bacteria in to baby's gut. Micro birthing is the procedure of applying the mother's vaginal fluid on babies' skin, mouth and eyes for the child delivered by the C-Section.

There may be the possibility of transferring harmful bacteria during Micro Birthing procedure, so screening protocol is essential before implementing the procedure.

Now a day's C-Section is remarkably increasing, according to the research from world health organization caesarean section use continues to rise globally. now the C-Section incidence is 21%, in coming decades this number set may increase continually and it may become 29% in 2030. So, the procedure like Micro Birthing may aid in the restoration of the infant's natural gut micro biome and support the C-Section baby's immunity.

### Key terms

Micro birthing, vaginal microbes, microbiota, lactobacillus, Escherichia and Bifidobacterium, swabbed vaginal secretions and a probiotics effect.

### I. Introduction

Micro birthing is otherwise called vaginal seeding. It is a medical procedure that wipes a baby's mouth, face, and skin with its mother's vaginal fluid after a caesarean section. The aim of this procedure is to transfer the mother's vaginal micro biome in to the baby in order to create the natural exposure that happens during vaginal birth but is actually interrupted in a Caesarean birth. Now a day's C-Section is significantly increasing such a new intervention is to be implemented.<sup>(6)</sup>

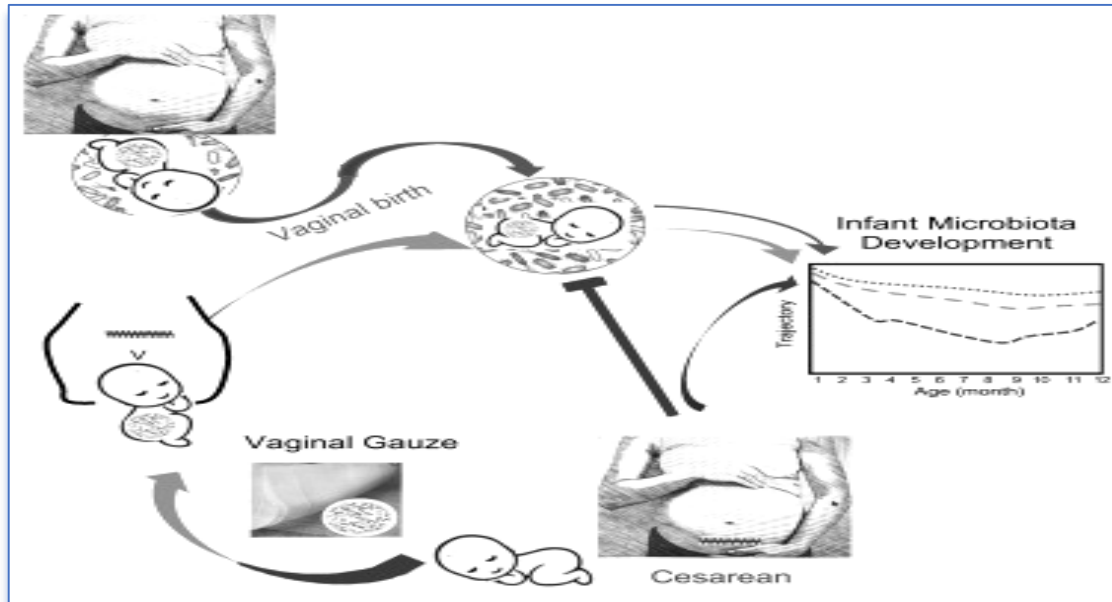
The history of Micro birthing began with Theodor Roseberry's Study about human micro biota in 1928 after many years; he published the book named "Microorganisms Indigenous to Man", about the role of Microbial colonization in forming the infant's micro biome.<sup>(10)</sup>

The idea of Micro Birthing was explored by Maria Gloria Dominguez Bello in 2015. Bello discovered, there is a significantly altered micro biome in the child born by the caesarean section that of natural birth.<sup>(10)</sup>

### Microbial Bond - The mother and baby

**Picture -1, describes on microbial connection can on the promotion of immune development.**

The mother and baby share a microbial bond even before birth. This bond exactly develops when a baby is born through the vaginal path. The baby is seeded with microorganisms by entering the mother's vaginal secretions through the baby's eyes, nose, mouth, and skin and entering the baby's gut. This microbial connection can on the promotion of immune development, impact childhood development, and influence well-being.



Picture - 1 on the microbial connection between the mother and baby.

**The development of neonatal micro biota:**

The establishment and development of the infant’s gut micro biota are due to two factors such as environmental factor and the host factor. During birth, the infant’s intestines are colonized with both beneficial and harmful microbes. The beneficial microbes have a great role in maintaining the infant’s health<sup>(5)</sup> The gut of neonates born vaginally is rich in lactobacillus followed by the bacteria such as senathia spp and prevotella, which is the main maternal vaginal micro biota. Initially, the infant’s gut micro biota exhibits low diversity and it

increases during the early life. Initial gut micro biotas are clostridia, enterobacteria, and streptococci. These organisms are few in number for the first two days of birth then it became 40% on the third day onwards. Between the 4 -7 days of birth bifidobacterium becomes the dominant micro biota until the beginning of weaning food to the infants. After ingestion of the solid food, the gut micro biota became similar that of adults. The infant born by C –Section leads to imbalances of the intestinal gut micro biota and a decrease in diversity.

**Infants gut micro biota**

The infant’s gut micro biota is mainly classified into six groups<sup>(7)</sup>

Group-I	Group-II	Group-III	Group-IV	Group-V	Group-VI
Bifidobacteriales Lactobacillales Anarostipes Clastridiales faecalibacterium	Verrucomicrobiales Bacterioidales	Clostridiales	Enterobacteriales	pasteurellales	salmonalales

**Bifidobacteria:** It belongs to the phylum actinomycetes group. It is an anaerobic gram + Ve bacilli. It was first isolated from the faces of breastfed infants as early as 1899. This bifidobacterence has been widely used in medicine and food. One study suggested that after being supplemented with Bifidobacterium longum among premature infants the inflammatory responses are weakened and restores the gut microbiota like term

infants. In early life, the Bifido bacterium plays a vital role in improving the baby’s, health.  
**The genus Lactobacillus:** is the dominant species in the infant’s gut microbiota and is noticed shortly after delivery. It transferred vertically to the offspring during normal vaginal birth and later it passed to the offspring during breastfeeding. This micro biota has been effective in relieving the abdominal colic of infants.



**Clostridia:** This Micro biota plays a very important role in maintaining the homeostasis of an infant's intestines.

**Veillonella:** This micro biota reduces the effect of Hurricane Maria due to infants' exposure to unsafe food.

**Akkermansia miniphila:** this micro biota controls intestinal inflammation and reduces intestinal permeability.

#### **The Role of the Microbiota in an Infant's future health**

During early life, the infant's gut micro biota is responsible for the development and shaping of the immune system, development of the central nervous system, helping for digestion, and metabolism of food.

The micro biota not only has a role in the early life health of infants but also has a vital role in the long-term health of infants.<sup>(7)</sup>

#### **The micro biota and shaping of an infant's immune system:**

The colonization of the microbes and the shaping of the immune system occur simultaneously in early life. The micro biota on the mucosa may shape the immune system directly or indirectly until the infant's immune system gets matured.

The metabolites of the micro biota act directly over the mucosal epithelial cells and regulate the immune response by gut microbes digesting the dietary fiber to produce the SCFAs which have a very wide range of effects on an infant's immune system.<sup>(7)</sup>

**The Theory of Micro Birthing :** The baby is exposed to the mother's vaginal microbes by applying the vaginal fluid on the eyes, nose, mouth, and skin by the healthcare team. These microbes enter to baby's gut after being swallowed by the newborn; these microbes have a vital role in the natural development of the immune system of the baby<sup>(4)</sup>.

#### **Micro birthing procedure.**

**Step 1:** Gauze is packed into the mother's vagina for one hour prior to the C-section and prior to the administration of pre-C-section antibiotics.

**Step 2:** The gauze is stored in a sterile container during the caesarean section.

**Step 3:** The baby's eyes, nose, mouth and skin are wiped with the gauze soaked in the mother's vaginal secretions immediately following the birth by C-section.

#### **Benefits of Micro Birthing Procedure**

1. Baby is benefited from microorganisms known as micro biota such as lactobacillus, and Bifidobacterium. This micro biome plays a vital role in the maturation of

intestinal tissue and pro biotic effects in the newborn's gut and also it facilitates immune system maturation.

2. Micro birthing procedure will facilitate the thickening of the infant's gut lining

3. Micro birthing procedure will establish a healthy gut-brain axis for the infants.

4. Micro birthing procedure will regulate the infant's metabolism and reduces the risk of developing childhood obesity.

5. Micro birthing procedure will help for the general improvement in the digestive capacity of the infant.

6. Micro birthing procedure will reduce the rate of infectious conditions in infants<sup>(4)</sup>

#### **Risk of Micro Birthing**

1. The vaginal seeding or micro birthing procedure may spread the harmful bacteria to the baby like Chlamydia, Genital Herpes, Gonorrhoea, and Group B streptococcus if not screened<sup>(2)</sup>

2. Infants may be prone to develop the infection

#### **Signs of Infant Infection Following Micro Birthing Procedure:**

1. Fever
2. Pink eyes (Conjunctivitis)
3. Poor Feeding
4. Rapid breathing
5. Skin Rashes
6. Sluggishness (lethargy)

#### **Related evidence**

1. Dominguez-Bello et al initial study on vaginal seeding, which was released in 2016, showed that this straightforward intervention aimed at micro biome development over the first month of life (Dominguez-Bello et al., 2016).

2. When the C-Section baby is initiated with breast milk within 1 hour of birth can mix with selected maternal fecal bacteria in the infant's stomach. The gut micro biome's temporal development closely paralleled that of vaginally delivered infants. *Bacteroides* and *Bifidobacterium spp.* are enriched in most seeded babies. This shows that early microbial colonization may be significantly influenced by exposure to mother gut bacteria. (Korpela et al., 2020)

3. Vaginal seeding and FMT are completely different. Additional vaginal seeding trials are required for the thorough investigation of the safety and effectiveness of the procedure, which is urgently needed. In FMT the mother delivered her



infant vaginally and would have naturally exposed the child to her vaginal fluids and vaginal micro biota. However, C-section delivery interrupts that process. (Mueller et al. 2019)

### Ethical Challenges Associated with Vaginal Seeding

Vaginal seeding also implicates a number of ethical issues with regard to clinical practice and research. The concept of informed consent and the regulations that require and its use are intended to provide patients and research subjects with full information about a treatment procedure, including its risks and benefits, so they can make educated ominous decisions about how to proceed. Any researcher conducting the study of a novel substance is s being tested in a human clinical trial requires applications with Investigational New Drug Application (IND) and Food and Drug Administration (FDA).<sup>(6)</sup>

### Clinical Implications of Maternal- Infant micro biome:

1. The nurse must follow the evidence-based guideline for protecting the integrity of the maternal–newborn micro biome.
2. Infection control measures are to be strictly followed to avoid unnecessary exposure to harmful bacteria
3. Harmful shifts in the mother-newborn micro biome may increase the risk of developing both short-term and long-term adverse health outcomes.:<sup>(5)</sup>

## II. Conclusion

Maternal-child microbial seeding enhances health outcomes by lowering the prevalence of infants' inflammatory disorders linked to C-sections. Micro birthing may be a straightforward and affordable public health measure that could lower the incidence of disorders linked to C-sections. But current and future studies are needed to determine the benefits and risks of vaginal seeding and will influence the regulation of this nascent technique, also this information seeding has to be taken place in order to incorporate an evidence-based practice for restoring natural exposure to the well-being of the future generation.

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