Environmental Exposures Influence on the Maternal Microbiome and Health of their Children

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Disclosure

• I have no conflicts of interest, sponsorships or commercial support to report

Objectives:

• Identify exposures that may alter the maternal microbiome

• Discuss potential health implications for their children’s health related to altered maternal microbiome composition during pregnancy and birth
Outline

• Background
• Methods
• Results
• Discussion
Interaction between Maternal & Fetal Environments

Maternal Exposome

Preconception

Pregnancy

Health Outcomes

Birth

Adulthood

Mechanisms influencing Development

Endogenous Factors
• Genetic variant
• Neurohormones
• Oxidative stress
• Inflammation

Exogenous Exposures (Exposome)
• Stress
• Medications
• Diet
• Pollutants

Contributors to Fetal Programming During Pregnancy

Fetal Environment

Maternal Exposome

Offspring
• Microbiome/Immunity
• HPA Axis Responsiveness
• DNA Methylation
• Telomere Length

Susceptibility to Diseases

Altered initial microbiome composition associated with altered methylation

Altered gut microbiome influences development of HPA axis responsiveness

DNA Methylation
Environment and DNA methylation
2 Questions

1. What is known about the maternal microbiome during pregnancy?

2. Do variations in the maternal microbiome during pregnancy influence children’s future health?
Integrative Review

Key words:

- Microbiome
- Microbiota
- Antenatal period
- Pregnancy
- Offspring
- Birth outcomes

Literature search:
Potentially relevant publications identified by literature search with keywords (n=254)

Filter:
Publications preliminarily meeting inclusion criteria (n=76)

Publications excluded after review of title and for duplication (n=178)

Publications selected for full-text retrieval and assessed for methodological quality (n=28)

Publications excluded after review of abstract (n=48)

Publications included for integrative review (n=20)

Publications excluded after methodological appraisal (n=8)
Results Overview

- Small sample sizes
- Observational and randomized control trials
- Ambiguous findings

Full Results freely available online:

Main factors identified

- Medications
- Maternal Comorbidities
- Diet

- Non-probiotic studies
- Probiotic Studies
Potential Health Implications

- Obesity
- Asthma
- Inflammatory Bowel Disease
- Preterm Infants
- Late Onset Sepsis
- Necrotizing Enterocolitis
- Death
- Altered Resident Microbes
- Atopy
- Diarrhea

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Clinical Implications

• Mode of birth
• Infant feeding
• Environmental toxicants
• Antibiotic use
Thank you!

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