Relationship between synbiotic components in the diet of atopic mothers and the synbiotic composition of breast milk. A hypothesis generating study.

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The synbiotic composition of the diet of the mother is reflected in the synbiotic composition of breast milk and sustains the prevention or promotion of the development of allergic disease in the infant.

Ethische beoordeling	Positief advies
Status	Werving gestart
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON27416

Bron
NTR

Verkorte titel
Synbio-Breast

Aandoening

Allergic disease

Ondersteuning

Primaire sponsor: OLVG
Overige ondersteuning: OLVG and Nutricia Research

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

the amount of lactobacillae/ml in mature breast milk (logCFU), 4 weeks post partum.

Toelichting onderzoek

Achtergrond van het onderzoek

Rationale
The gut microbiome plays a key role in a healthy immune development of infants, including the prevention of allergies. During the prenatal and postnatal period the intestinal microbial colonization of the infant is established. Diet strongly influences microbial colonization. Naturally, breast milk is the first type of nutrition encountered by infants. However, there are conflicting results on the preventive effect of breast feeding on allergy development in the infant, although most studies found a protective effect.
The following components in breast milk are of specific interest for allergy prevention, based on their influence on the gut microbiome:
1. human milk oligosaccharides (HMOs), because HMOs serve as a prebiotic substrate for the infant's gut bacteria, inducing a beneficial bifidogenic composition
2. butyrate, a short chain fatty acid and metabolite of microbial fermentation
3. the microbial content in breast milk, acting like natural probiotics and interacting with the microbiome of the infant's gut.
Although it is known that diet influences the composition of breast milk, only few studies have focused on this topic. It is unknown if HMOs, butyrate or the microbial composition of breast milk, in other words the synbiotic components of breast milk, can be modified by the mother's diet, e.g. by dietary fiber or the microbial content. Dietary fiber is crucial for a healthy gut microbiome and food-derived microbes are of interest because the consumption of food-derived microbes varies considerably, between 105 and 1011 microbes (or 10.7 -10.11 lactobacillae) per day in Dutch adults.

We hypothesize that the synbiotic composition of the diet of the mother is reflected in the synbiotic composition of breast milk and supports the prevention of allergic disease in the infant. In this process, the microbiome of the mother and the infant play a role.
It was shown that bacteria from probiotic supplements (lactobacillus and bifido bacteria) in breast feeding mothers could be found in breast milk and significantly increased the lactobacillus and bifido bacteria in breast milk. No differences were found between colostrum and mature milk with regard to the amount of lactobacillus and bifido bacteria. In our nutrition lactobacillae are the major source of microbial intake.
Therefore, the primary aim of the Synbio-breast study is to study the influence of the amount of lactobacillae in the diet of the mother on the amount of lactobacillae in mature breast milk (4 weeks post partum).
The primaire outcome measure is the amount of lactobacillae/ml in mature breast milk

(logCFU), 4 weeks post partum.

The secondary aims are to study the influence of the diet of the mother , specifically dietary fiber and/or the total microbial composition, 3 days and 4 weeks post partum, on secondary outcome measures:
a. the amount and types of remaining microbes in breast milk
b. the amounts and types of HMOs in breast milk
c. the amount of butyrate in breast milk

Doel van het onderzoek

The synbiotic composition of the diet of the mother is reflected in the synbiotic composition of breast milk and sustains the prevention or promotion of the development of allergic disease in the infant.

Onderzoeksopzet

Primary outcome, 4 weeks post partum:
Amount of lactobacillae/ml in mature breast milk (logCFU), 4 weeks post partum, measured by IS-pro or 16S sequencing
Secondary outcomes, 3 days and 4 weeks post partum:
- amount of remaining microbes in breast milk, by IS-pro or 16S sequencing, as well as conventional plating
- the amounts and types of HMOs in breast milk by CGE-LIF.
- the amount of butyrate in breast milk.by gas chromatography.

Onderzoeksproduct en/of interventie

none

Contactpersonen

Publiek

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Wetenschappelijk

OLVG
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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

• Uncomplicated pregnancy
• Delivery at OLVG out clinic or clinic department or at home
• Atopic (n = 65) and non-atopic (n = 10)
• BMI between 20-35 kg/m2 before pregnancy.
• Vaginal delivery
• Intention to breastfeed exclusively for at least 1 months
• Ability to speak and write in Dutch

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

• Birth before 37 weeks of gestation
• Cesarean section,
• Small for gestational age (P98)
• Supplementary bottle feeding after birth (except for 1 single bottle feeding)
• Antibiotic use within 6 months before study entry or during study
• Probiotic-containing supplement use within 4 weeks before study entry or during study
• Serious concomitant (gastrointestinal) disease
• Fecal transplantation.
• Maternal diabetes during pregnancy
• Moderate to severe atopic dermatitis
• Not able to speak and write in Dutch properly.

Onderzoeksopzet

Opzet

Type:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Anders
Toewijzing:	N.v.t. / één studie arm

Controle: N.v.t. / onbekend

Deelname

Nederland

Status:	Werving gestart
(Verwachte) startdatum:	01-03-2018
Aantal proefpersonen:	75
Type:	Verwachte startdatum

Voornemen beschikbaar stellen Individuele Patiënten Data (IPD)

Wordt de data na het onderzoek gedeeld: Nee

Ethische beoordeling

Positief advies

Datum:	04-01-2021
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL9168
Ander register	ACWO OLVG : WO17.186

Resultaten