Carbamoyl-phosphate synthetase gene polymorphisms influencing plasma L-arginine concentrations in preterm infants

Published: 28-06-2007
Last updated: 10-05-2024

To determine whether the T1405N SNP in the CPS-1 gene is associated with lower plasma L-arginine concentrations in preterm infants and to determine whether the T1405N SNP in the CPS-1 gene is associated with a higher risk of NEC.

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Gastrointestinal inflammatory conditions
Study type	Observational invasive

Summary

ID

NL-OMON31504

Source
ToetsingOnline

Brief title
CPS-polymorphisms and NEC

Condition

- Gastrointestinal inflammatory conditions
- Protein and amino acid metabolism disorders NEC

Synonym
enteritis in preterm infants

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Ziekenhuis Maastricht
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: CPS-polymorphisms, L-arginine, NEC (= necrotiserende enterocolitis), Preterm infants

Outcome measures

Primary outcome

The association between the T1405N SNP in the CPS-1 gene and lower plasma

L-arginine concentrations

Secondary outcome

The difference in genotype distribution of this polymorphism between VLBW

infants developing necrotizing enterocolitis and those who do not.

Study description

Background summary

Plasma L-arginine concentrations are decreased in premature infants with necrotizing enterocolitis (NEC). A C-to-A nucleotide transversion (T1405N) in the gene that encodes carbamoyl-phosphate synthetase 1 (CPS1), the rate-limiting enzyme in the urea cycle, has been correlated with low plasma concentrations of L-arginine in neonates (> 35 weeks of gestation). Recently Moonen et al (submitted to Pediatric Research) described a correlation between this CPS1 T1405N single nucleotide polymorphism (SNP) and the presence of NEC in VLBW infants. However there is no data about the correlation between the plasma arginine concentrations and the T1405N SNP in the CPS-1 gene in VLBW infants. In the present project we postulate that T1405N SNP in the CPS-1 gene is associated with lower plasma arginine concentrations and is also a risk factor for the development of NEC.

Study objective

To determine whether the T1405N SNP in the CPS-1 gene is associated with lower

plasma L-arginine concentrations in preterm infants and to determine whether the T1405N SNP in the CPS-1 gene is associated with a higher risk of NEC.

Study design

Prospective, multicenter cohort study.

Study burden and risks

one blood sample (500 microliter) will be obtained from each VLBW infant between 6 and12 hours after birth from an umbilical-artery or peripheral artery catheter. When not available, blood samples will be obtained from venous puncture. The blood sample will be taken at the same time as the regular bloodsamples.
The risks are those of venous puncture or taken blood from a catheter and are minimal and the burden is negligible.
An additionale buccal swab will be obtained. The risks and burden of a buccal swab are negligible.
This study can only be done using this patient group because necrotizing enterocolitis primarily afflicts premature infants born weighing less than 1500 g. There is a group relatedness.

Contacts

Public
Academisch Ziekenhuis Maastricht

Postbus 5800
6202 AZ Maastricht
Nederland
Scientific
Academisch Ziekenhuis Maastricht

Postbus 5800
6202 AZ Maastricht
Nederland

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Children (2-11 years)

Inclusion criteria

VLBW infants (<30 weeks and < 1500 gram birth weight)

Exclusion criteria

Blood transfusion, enteral or parenteral protein intake, or inhaled nitric oxide administration before time of the bloodsample (obtained between 6 and12 hours after birth). Parents not able to give informed consent.

Study design

Design

Study type: Observational invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	09-07-2007
Enrollment:	100
Type:	Actual

Ethics review

Approved WMO

Date:	28-06-2007

Application type:	First submission
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)
Approved WMO Date:	22-08-2008
Application type:	Amendment
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
ClinicalTrials.gov	NCT00554866
CCMO	NL17091.068.07