Long-term Effects of selective fetal growth restriction in MONochorionic twins

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON24670

Source
NTR

Brief title
LEMON

Health condition

Selective fetal growth restriction (sFGR), monochorionic twins.

Sponsors and support

Primary sponsor: Leiden University Medical Center
Source(s) of monetary or material Support: The Dutch Heart Foundation

Intervention

Outcome measures

Primary outcome

The project addresses five primary objectives:
I. To assess long-term neurodevelopmental outcome using cognitive tests
II. To assess long-term cardiovascular outcome using cardiac ultrasound

III. To assess long-term pulmonary outcome using spirometry
IV. To assess long-term growth by evaluating childhood growth patterns
V. To assess long-term (epi)genetic changes by evaluating DNA methylation patterns in buccal swabs
These outcomes will be examined in a large cohort of MC twins with sFGR and compared between the small and the large twin.

Secondary outcome

The project addresses multiple secondary objectives that can be grouped into the same five categories as the primary objectives:

I. Neurodevelopmental outcome
a) To describe the incidence of mild and severe NDI.
b) To identify potential risk factors within the sFGR population for low cognitive test scores.
c) To evaluate long-term behavioral outcome, attachment, quality of life and school functioning including academic performance.

II. Cardiovascular outcome
a) To assess within-pair differences in blood pressure.

III. Pulmonary outcome
a) To document within-pair differences in atopic constitution.

IV. Growth
a) To assess pubertal development.
b) To assess intra-twin growth patterns in the sFGR population.

V. (Epi)genetics
a) To describe epigenetic differences in peripheral tissue (buccal swabs) as a possible underlying mechanism for the mediation of the long-term effects of FGR. The specific DNA methylation patterns found in the Twinlife study will be examined in the population of the current study as well to examine their link with long-term outcomes.

Study description

Background summary

Selective fetal growth restriction (sFGR) in monochorionic (MC) twin pregnancies is characterized by a large intertwin growth discrepancy due to unequal placental sharing. Neonatal morbidity and mortality associated with sFGR have been thoroughly described, but data on long-term outcomes is lacking although we know that fetal growth restriction (FGR) in singletons has been associated with an increased risk of neurodevelopmental impairment (NDI), cardiovascular disease (CVD), impaired lung function and suboptimal growth later in life. Knowledge of long-term outcomes is essential both for adequate counselling of parents

of these vulnerable patients and for early identification of children who will benefit from additional postnatal monitoring. Moreover, a better understanding of long-term outcome might aid in devising feasible management options in the future.Therefore, insight into long-term outcomes is crucial in providing the highest standard of care for MC twins with sFGR. The results of this study will be complementary to the Twinlife study (NL67331.058.18) which is already ongoing at the LUMC.

The main objective is to assess long-term neurodevelopmental, cardiovascular, pulmonary, and growth outcomes in a cohort of MC twins with sFGR and to compare outcomes within sFGR twin pairs. The study population consists of all MC twin pairs with sFGR born in the LUMC between 2002 and 2017. We defined sFGR as a birth weight discordance (BWD) ≥ 20%.

To assess long-term neurodevelopmental outcome, cognitive and motor development will be evaluated using standardized psychometric age-appropriate tests and a neurological examination. Echocardiography will be used to assess differences in structural cardiac measures and cardiac function, including aortic pulse-wave velocity (aPWV) and carotid intima-media thickness (cIMT). Spirometry will be recorded in children ≥ 4 years old to quantify lung function, including forced vital capacity (FVC), forced expiratory volume in one second (FEV1) and forced mid-expiratory flow rate (FEF(25%-75%). Growth will be assessed using available childhood growth curves from the primary care system and by detailed anthropometric measurements.

Study objective

The growth-restricted twin will have an increased risk of neurodevelopmental impairment, cardiovascular disease, impaired lung function and suboptimal growth later in life as opposed to its appropriately-grown co-twin.

Study design

Parents and children are asked to fill in part of questionnaires at home prior to the follow-up examinations. Two examinations will be scheduled, one for the for the neurodevelopmental assessment, growth measurements and the buccal swab and one for the echocardiography and spirometry.

Contacts

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Eligibility criteria

Inclusion criteria

To be eligible to participate in this study, a subject must meet all the following criteria:
• MC twins with sFGR born in the LUMC.
• Children aged 2 to 17 years at time of inclusion.
• Children currently living in the Netherlands.
The parents of a potential subject must meet the following criteria:
• Parent(s) aged ≥ 18 years, who are able to consent.
• Written informed consent from both parents to participate, form being approved by the Ethic Committee.

Exclusion criteria

A potential subject who meets any of the following criteria will be excluded from participation in this study:
• MC twins with TTTS or TAPS.
• Twin Reversed Arterial Perfusion (TRAP).
• Monoamniotic twin pregnancies.
• Children passed away before inclusion.
• Single survivors.
• Children born with congenital/chromosomal abnormalities.

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non controlled trial
Masking:	Open (masking not used)

Control:	N/A , unknown

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	05-01-2021
Enrollment:	132
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date:	27-10-2021
Application type:	First submission

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
NTR-new	NL9833
Other	METC-LDD : P20.089

Study results