Reducing bilirubin-induced neurological dysfunction (BIND) in premature newborns, additional use of bilirubin:albumin ratio in the treatment of hyperbilirubinemia

Published: 09-01-2007
Last updated: 14-05-2024

The research question of this study is whether BIND is reduced using B:A ratios in addition to TSB versus TSB only as indicators for treatment of hyperbilirubinemia in preterm infants.

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON30420

Source
ToetsingOnline

Brief title
Reducing BIND in premature newborns

Condition

- Other condition
- Neonatal and perinatal conditions

Synonym
hyperbilirubinemia, neonatal jaundice

Health condition

hyperbilirubinemie en ontwikkelingsachterstand

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: ZonMW doelmatigheidsstudies 2007

Intervention

Keyword: 1. Hyperbilirubinemia, 2. Bilirubin induced neurological dysfunction (BIND), 3. Bilirubin:albumin ratio, 4. Neurodevelopmental outcome

Outcome measures

Primary outcome

Primairy outcome variables are: neurodevelopmental outcome at 18-24 months of age using standardized neurological examination and mental- and psychomotor developmental index scores (MDI and PDI).

Secondary outcome

Secondary outcome variables are peak TSB, peak B:A ratio, duration of hyperbilirubinemia, number and duration of phototherapy, number exchange transfusions, and the standard complications of prematurity such as mortality, RDS, BPD, ROP, NEC, IVH, PVE/PVL etcetera.

Study description

Background summary

Neonatal jaundice due to unconjugated hyperbilirubinemia occurs is almost all preterm infants and is potentially neurotoxic. Treatment is based on total serum bilirubin (TSB), but is not evidence based. TSB is an unreliable predictor of bilirubin induced neurological dysfunction (BIND). Free bilirubin, i.e. not bound to albumin, is a better parameter for bilirubin neurotoxicity, but measurements of free bilirubin concentrations are not available in clinical practice. The bilirubin: albumin ratio is considered as a surrogate parameter

for free bilirubin. Low albumin levels (i.e. high B:A ratios) increase free bilirubin levels and potentiate risk of BIND. The B:A ratio is thus an interesting additional parameter in the management of hyperbilirubinemia in preterm infants.

Study objective

The research question of this study is whether BIND is reduced using B:A ratios in addition to TSB versus TSB only as indicators for treatment of hyperbilirubinemia in preterm infants.

Study design

Prospective, randomized controlled, open label, blinded outcome multicenter study in tertiary neonatal intensive care units in the Netherlands

Intervention

Hyperbilirubinemia is evaluated daily using the B:A ratio together with TSB (study group) versus TSB only (control or care-as-usual group). Treatment guidelines are based on B:A ratio and TSB (whichever comes first) versus only TSB.

Study burden and risks

Daily blood examinations in the first 10 days of life will include measurements of bilirubin and albumin levels. The estimated total bloodvolume for these measurements is approximately 1.0 mL (10 x 100µL (about 10 µL plasma per measurement)). Usually, these measurements do not require extra blood volume. Sometimes, more blood is required (maximal 10 x 0.1 ml = 1.0 ml), but no extra puncture will be necessary.
Residual blood samples will be stored for free bilirubin measurements: no extra punctures will be done for this purpose.
Residual urine samples that are collected as part of the routine clinical treatment, will be stored for lumirubine measurements.
It is a possibility that the childeren will be subjected to phototherapy or exchange transfusion earlier than in the care-as-usual protocols. On the other hand, earlier start of phototherapy may prevent exchange transfusions. The net effect cannot be predicted.
A part of the studypopulation will be subjected to a more extended audiological evaluation (ABR) than in the routine protocol (ALGO). The ABR and ALGO consist of auditory stimuli via a headphone, registered by 3 (ABR) or 1 (ALGO) head-electrodes.
A full developmental test is part of the studyprotocol. In general these tests are part of the routine follow-up visits of NICU-graduates.
It is the intention to perform additional neurodevelopment assessments at later

ages (4-7years), but those are beyond the scope of this study protocol.

Contacts

Public
Universitair Medisch Centrum Groningen

Hanzeplein 1
9700 RB Groningen
NL
Scientific
Universitair Medisch Centrum Groningen

Hanzeplein 1
9700 RB Groningen
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Children (2-11 years)

Inclusion criteria

Prematurity < 32 weeks postmentrual age

Exclusion criteria

major congenital malformations, clinical syndromes and chromosomal abnormalities

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Diagnostic

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	01-05-2007
Enrollment:	614
Type:	Actual

Ethics review

Approved WMO

Date:	09-01-2007
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

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
CCMO	NL14881.042.06