Iron status, haemoglobin and red blood cell biomarkers during infancy.

– potential improvements and new possibilities in clinical diagnostics.

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BACKGROUND
Infants are at risk of iron deficiency which may lead to serious sequelae as anaemia and hampered neurofunctional development, however also excess iron is detrimental to health. Reliable diagnostics is needed. As current normative knowledge is mainly based on small cohorts, hospital data or extrapolation of data from older children, this necessitates further studies to better understand the interplay of iron status with dynamic changes first year in life.

AIM
The overall aim of this project is to evaluate different aspects of infant iron status diagnostics. The project creates a body of knowledge on iron status biomarkers in healthy, term infants 0 – 12 months old and uses this understanding to gain insight in iron status development after extremely preterm birth.

METHODS
The first three projects are retrospective studies based on data from presumably healthy infants, born term and longitudinally followed 0 – 12 months. Reference intervals were calculated with guidance from the standards published by Clinical and Laboratory Standards Institute. Project 4 is part of a prospective multicentre randomized controlled intervention trial (ongoing).
RESULTS

Paper I: Ferritin concentrations were lower in boys and reference intervals were divided into subclasses by age and sex. Differences in ferritin were most pronounced at the upper limits and peaked at 12 months, where the boys’ upper 97.5th percentile was 56% compared to girls.

Paper II: For sTfR, significant age differences were found and sTfR followed the dynamic changes of infant growth. Minor differences between sexes were found at 4 months. sTfR did not covariate with CRP concentrations >1 mg/L, except in the 48-96 hours samples.

Paper III: Reference intervals for haemoglobin and red blood cell biomarkers were mainly narrower compared to other studies. Also, if adhering to the WHO threshold of Hb <110 g/L, 16% of presumably healthy infants would be considered anaemic at 12 months.

SIGNIFICANCE

These studies present data that can support future interpretation of patient lab results. Reference data are also needed in epidemiological studies and disagreement with the WHO classification for haemoglobin, despite favourable conditions in infancy, needs future investigation.

Publications

