Urinary iodine concentration in infancy as an IDD monitoring indicator: establishment of a reference range in iodine-sufficient Swiss newborns

Projekt: 348

Michael Zimmermann

Institute for Food Science and Nutrition, ETH Zürich
Tel: ++41 44 632 86 57 Email: michael.zimmermann@ilw.agrl.ethz.ch

Background
Iodine deficiency in infancy can impair neurocognitive development, but there are few available indicators of iodine intake during this critical period. In many countries, access to newborns in maternity clinics in the first few days after birth is high. If spot urine samples could be collected, reference data for urinary iodine concentration (UIC) would be useful to evaluate their iodine status.

Objectives
1) To develop and validate a simple pad system for collection of spot urine samples for iodine
2) to establish a reference range for UIC in newborns in the first week after birth for use in monitoring iodine nutrition

Study Design
A 2-stage cluster sampling was used to obtain a representative national sample of healthy, term Swiss infants, 0 to 5 days old (n=634). Gestational information, whole blood for TSH, and spot urine samples on two consecutive days were collected.

Results
The pad collection system was well-accepted and performed well during recovery and contamination testing. Median UIC in the total sample (n=1224) was 77 (95% CI; 76, 81) µg/liter; there was a gradual increase in median UIC within the range of 70-100 µg/liter from days 1 through 4. Because urinary creatinine concentrations were high and variable, the UI:creatinine ratio was not useful for standardization.

Conclusion
The current WHO median UIC cut-off (>100 µg/liter) for iodine sufficiency in infancy may be too high for the first week after birth. Reference data from iodine-sufficient newborns and a simple collection system may facilitate use of urinary iodine concentration as an indicator of iodine status in this age group.