Objective: To measure levels of colostrum iodine, which has not been previously measured, and perchlorate and cotinine (a surrogate for thiocyanate derived from cigarette smoke) in women up to 60 hours postpartum. Perchlorate and thiocyanate are environmental inhibitors of iodide transport into the thyroid and lactating breast.

Design, Patients, Measurements: Design was cross-sectional. Ninety seven postpartum women in Boston were investigated. Colostrum iodine and perchlorate, and spot urine iodine, perchlorate, cotinine and creatinine concentrations were measured.

Results: Sufficient colostrum was obtained to measure iodine in 61 samples and perchlorate in 46 samples. Median colostrum iodine content was 51.4 µmol/L (range: 21.3-304.2 µmol/L). Perchlorate was detectable in 43 of 46 colostrum samples (median: 2.5 µmol/L; range: <0.05-188.9 µmol/L). Median urine iodine in 97 samples was 82.2 µmol/L (range: 10.3-417.1 µmol/L). Perchlorate was detectable in all 97 urine samples (median: 2.6 µmol/L; range: 0.2-160.6 µmol/L). Colostrum iodine content was not significantly correlated with levels of colostrum perchlorate or concentrations per litre of urinary iodine, perchlorate, or cotinine. Colostrum perchlorate concentrations were not significantly associated with urinary iodine, perchlorate, or cotinine levels. Urinary cotinine levels were not significantly associated with urinary iodine or perchlorate levels. There was no association between maternal urinary iodine and urinary perchlorate levels.

Conclusions: Iodine is present in human colostrum and thus available for breastfeeding infants immediately after birth. Perchlorate was also present in 93% of samples measured, but the concentrations did not correlate with colostrum iodine concentrations.

COMMENT

Normal thyroid function depends upon the availability of an adequate iodine intake. Since the breastfed newborn is reliant upon the iodine content of breast milk, the present study is important in showing, for the first time to the knowledge of the authors (and ours), that human colostrum, measured immediately after birth, contains iodine that is therefore readily available to the infant, in a period critical for its neurodevelopment.

In women in the Boston area, the median iodine content of colostrum was 51 µmol/L, with a range between 21 and 304 µmol/L (corresponding to a mean 65 µg/L and a range of 27-380 µg/L). These figures indicate clearly that significant amounts of iodine are directly available to the neonate via breastfeeding in the first hours of life. The authors also showed that perchlorate was present in the urine of most women after birth. Presence of perchlorate results from the environment but does not seem to affect colostrum iodine content. Adequate iodine intake for lactating women is important to promote adequate iodine availability to the nursing infant. The authors insist on the recent recommendation by the ATA – following recommendations made by international
agencies such as WHO – that all women in the USA and Canada should receive iodine supplements (150 μg/day) during pregnancy and lactation, and that all prenatal vitamins should contain 150 μg of iodine. These safe and inexpensive public health measures ought to be carried out urgently to ensure adequate dietary iodine fortification to the breastfed infant. (Daniel Glinoer, M.D.; Ph.D.)

See Table below

| Table 2. Median colostrum and urinary iodine, perchlorate, and cotinine concentrations. |
|---------------------------------|-------|--------|-------|
| Colostrum iodine (μmol/l)       | 61    | 51·4   | 21·3–304·2 |
| Colostrum perchlorate (μmol/l) | 46    | 2·5    | <0·05–188·9 |
| Urine iodine (μmol/l)           | 97    | 82·2   | 10·5–417·1 |
| Urine perchlorate (μmol/l)      | 97    | 2·6    | 0·2–160·6 |
| Urine cotinine (nmol/l)         | 95    | 6·4    | <5·7–5481·2 |
| Urine iodine/creatinine (μmol/μmol) | 96  | 168·3  | 36·5–1184·0 |
| Urine perchlorate/creatinine (μmol/μmol) | 96  | 3·7    | 0·30–68·4 |
| Urine cotinine/creatinine (nmol/μmol) | 95  | 100·0  | 0–303·407 |