SUMMARY

Objective: To investigate maternal urinary iodine excretion (UIE) in the immediate antenatal and early postpartum periods.

Patients and design: The study included urine specimens from 42 women at a mean of 39 weeks of gestation, measured again at 3 and 10 days postpartum. The study also included urine specimens obtained from 17 mothers and their neonates at 3 and 10 days postpartum, with a subdivision between breastfed and bottle-fed babies.

Results: Maternal UIE showed a precipitous fall in the immediate antenatal and early postpartum periods, from a median of 93 µg/L antenatally to 36 µg/L at delivery, subsequently rising to 49 µg/L and 63 µg/L at days 3 and 10 postpartum respectively. The fate of ingested iodine not appearing in the maternal urine is unknown but measurement of UIE in babies born to nursing mothers suggested transfer from mother with median neonatal values of 117 µg/L and 159 µg/L being recorded at days 3 and 10 respectively. While maternal UIE seemed relatively unaffected by breastfeeding, median UIE from breastfed babies was significantly greater than in bottle-fed babies (148 µg/L versus 50 µg/L). This marked difference was also reflected by the finding that no breastfed baby had a UIE value below 50 µg/L in comparison to 50% below 50 µg/L among bottle feeders.

Conclusion: The depressed UIE values in mothers at parturition and relatively high values in their infants could present a ‘false’ picture, suggesting to the authors the need to defer any investigations of the iodine status at this time. The present findings also suggest a need for further investigations aimed at determining the fate of iodine ingested perinatally and its possible physiological significance in maintaining thyroid status in the mother and neonate.

COMMENT

The present study was carried out in an area with borderline iodine restriction (median UIE in non pregnant control women was 91 µg/L, with 22% of them <50 µg/L). The main finding in this study was a sharp decrease in maternal UIE from 93 µg/L antenatally to 36 µg/L at parturition, followed by a progressive recovery with median UIE values of 49 µg/L (day 3 PP) and 63 µg/L (day 10 PP). Furthermore, maternal UIE values were similar at day 10 postpartum (PP) in breastfeeding compared with bottle feeding mothers. Neonatal UIE values were adequate, reaching a median value of 117 µg/L (day 3 PP) and 159 µg/L (day 10 PP). However, there was a clear difference in the median neonatal UIE values between the breastfed (149 µg/L) and bottle-fed (50 µg/L) infants. This study questions the
‘fate’ of maternal iodine in the perinatal period. First, it is important to note that antenatal maternal UIE was measured between gestation weeks 35 & 42, and the authors could only assume (but not prove) that the iodine intake remained unchanged after the last urine measurement. Second, it is known that during pregnancy, UIE is only an indirect (and imprecise) reflection of the iodine nutrition status, since the ingested iodine is: a) avidly taken up by the maternal and fetal thyroid glands, b) transferred to the placenta (which acts as an active iodide trapping pump), and c) excreted through an increased iodine renal clearance. At parturition, iodine transfer to the placenta stops sharply and the increased iodine renal clearance ceases to compete with iodine uptake, both by the maternal thyroid gland and the mammary glands. The balance between these different fates of ingested iodine in the days following delivery is not precisely known (and is impossible to measure). The present results suggest that the breast actively concentrates a large part of maternal iodine (nature does well !) since the neonatal UIE values were 2.4-fold and 2.5-fold higher, respectively at days 3 and 10 PP, than the corresponding maternal UIE values. Finally, this study also points to the need to fortify bottle feeding by supplemental iodine, a public health measure that has been implemented in our country since many years by adding iodine to formula milk. (Daniel Glinoer, M.D.; Ph.D.)

See Figure below

![Figure 1: Sequential urinary iodine (UI µg/L) in pregnant mothers and their offspring.](image-url)