Comparison of neonatal thyroid-stimulating hormone levels and indicators of iodine deficiency in school children.

Department of Epidemiology, Rollins School of Public Health of Emory University, Atlanta, GA 30322, USA.

Abstract
OBJECTIVES: To compare thyroid-stimulating hormone (TSH) levels in neonatal cord blood between study sites in Bangladesh, Guatemala and the United States. Also, to compare neonatal TSH results with indicators of iodine deficiency in school children.

DESIGN: Consecutive births and, in school children, cross-sectional surveys.

SETTING: Savar, Bangladesh; San Pedro Sacatepequez, Guatemala; and Atlanta, United States.

SUBJECTS: In each study site, cord blood was spotted on to filter paper and TSH levels determined using a sensitive monoclonal assay. In the USA, heel stick blood specimens from newborns spotted on to filter paper were also obtained as well as exposure to iodine-containing antiseptics during the birthing process. Urine specimens were collected from mothers of newborns and tested for iodine concentration. School children in the same areas were surveyed for thyroid size by palpation and ultrasonography, and urine specimens collected for iodine concentration.

RESULTS: Between 141 and 243 cord blood specimens were collected from each study site. The prevalence of elevated cord blood TSH levels (> 5 mU/l-1) was high in all study sites, from 58% to 84%. All sites would be categorised as having 'severe' iodine deficiency based on WHO/UNICEF/ICCIDD criteria. Iodine-containing antiseptics were used during 98% of the births in the USA but not in Bangladesh or Guatemala. The neonatal TSH classification indicated more severe iodine deficiency levels than classifications based on urinary iodine and goitre in school children.

CONCLUSIONS: In the USA, elevated TSH levels may be partially attributed to use of beta-iodine-containing antiseptics prior to birth. We recommend the cautious interpretation of TSH results in newborns for the assessment of iodine deficiency disorders when iodine-containing antiseptics are used during the birthing process.

PMID:12001982[PubMed - indexed for MEDLINE]