

Transient TSH elevation in infants referred on newborn screening – features, prevalence and trends

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Background

Up to 20% of infants referred on newborn congenital hypothyroidism (CH) screening are subsequently shown to have transient TSH elevation rather than permanent CH. Accurate identification of such cases is important to avoid prolonged treatment with thyroxine and unnecessary clinic attendance.

Objective

To determine the prevalence, trends and profile of infants with transient TSH elevation referred between August 1979 and December 2015 by the Scottish Newborn Screening Programme.

Method

Analysis of infants referred during the study period with initial/repeat capillary TSH $\geq 50/\geq 25$ mU/L (1979-82); $\geq 40/\geq 15$ (1982-89); $\geq 40/\geq 10$ (1989-2002); $\geq 25/\geq 8$ (2002-15) in whom venous thyroid function tests subsequently became normal off thyroxine. Details of gestation, birthweight (BW), "sickness" and extra-thyroidal congenital malformations (CM) were recorded.

Results

Of 2,202,191 newborns screened, 936 were referred by the screening laboratory during the study period including 630 (68.9%) with definite CH; 208 (22.8%) with transient TSH elevation and 58(6.35%) patients with status uncertain.

Groups	Definite CH N=630	Transient TSH elevation N=208
Birth weigh(kg) Mean	3.3	2.7
	0.7-5.5	0.7-4.6
Gestational age (weeks)		
Mean	39.6	36.5
Range	27-43	24-42
GA < 30 weeks(%)	0.5	12.9
Sickness(%)	7.1	35.6
Congenital malformations(%)	5.7	20.7
Capillary TSH(mU/l) median	167.5	37
range		
Venous TSH(mU/l) median	102	12.5
range		
FT4(pmol/l) median	6.6	15.15
range		
Second TSH sample(%)	12	50

Table 1: characteristics of CH and transient TSH elevation groups.

Etiologies of Transient TSH elevation	N=208
Blocking maternal antibodies	3
Maternal carbimazole	1
Pendrin mutation	1
TSH receptor heterozygoty	1
Down syndrome	12

Table 2: Specific aetiologies of transient TSH elevation.

The incidence of transient TSH elevation was 6.6 and 5.1/yr between 1982-2004 and 2005-15. Of 43 transient cases with CM, 19 involved the digestive system/abdominal wall of which 15 were born \leq 2004 when iodine antiseptics was largely discontinued in Scottish newborn units.

Conclusion

Infants with low BW, extreme prematurity, sickness, additional malformations, Down syndrome and modest capillary/venous TSH elevation are particularly likely to have transient thyroid dysfunction especially if diagnostic imaging shows a eutopic thyroid gland. Such infants require careful re-evaluation at \geq 3 years of age. Trends in transient TSH elevation will be influenced by capillary TSH cut-offs being altered, reduced iodine antiseptics usage, and the currently unknown dietary iodine status in Scottish mothers.

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