INTRODUCTION

Effective newborn screening service depends on: timely sampling
• An adequate sample transport system
• Prompt laboratory testing
• Efficient communication of results to the clinician
• Early clinical review and (if necessary) treatment.
• Previous audits of the Scottish programme have highlighted problems with late initial capillary TSH sampling, particularly in sick infants and delay between initial and recall sampling.
• This analysis of the thyroid screening programme in Scotland focuses on trends in age at initial screening, interval between initial sample and laboratory processing, and age of notification after single screening and second screening.

PATIENTS AND METHODS

• The Scottish Congenital Hypothyroidism database (held since 1979) was interrogated for age (days) at first newborn “Guthrie” screening test (G1), age at laboratory receipt/testing, notification and start of treatment and age at second “Guthrie” test (G2).
• Patients were grouped into 4 categories: definite congenital hypothyroidism; probable congenital hypothyroidism; status uncertain; and transient TSH elevation as previously described.1,2
• Data are expressed as median, mean ± standard error of the mean (SEM), lower quartile (Q1) and upper quartile (Q3).
• The following standards were set:
  • Age at first “Guthrie” (G1) 4-7 days
  • Interval between G1 and testing by laboratory 4 days
  • Interval between G1 and notification 7 days
  • Age of notification after single sampling 14 days
  • Age at notification for infants requiring 2nd sampling 26 days

RESULTS 1

Between 1980 and 2013 2,071,759 newborns were screened and 903 infants were referred with capillary TSH elevation: 609 with definite congenital hypothyroidism, 15 with probable congenital hypothyroidism, 45 with status uncertain, 200 with transient TSH elevation, and 34 with insufficient data.

RESULTS 2

Box and whisker plot showing that interquartile intervals between initial sampling (G1) and receipt/testing by the laboratory are within the standard. However interval is still >4 days in some patients, eg 19/150 (12.6%) infants between 2000-2004, 15/156 (9.6%) between 2005-2009 and 13/118 (11%) between 2010-13.

INFANTS 4-7 DAYS

Table 4: Patients with true CH (Definite and Probable)

DISCUSSION

• Virtually all infants referred with TSH elevation in Scotland now undergo initial testing within 4-7 days.
• Although the laboratory is able to start processing samples within 4 days in most cases, about 10% of infants are processed later than this.
• Sending samples by express mail rather than first class post in all Scottish newborns would be too costly but reducing the age at testing to 3-4 days should be considered.
• Recent Scottish quality indicators have stated that a baby should be seen by the clinician on day 14 of life after single sample, and by day 21 for infants referred after a second sample. Scrutiny of our time lines for transport of samples to the laboratory and notification of results led us to select a target age of 26 rather than 21 days for these infants.
• Age at notification is usually well within the 14 day standard for first sample referrals, particularly in true congenital hypothyroidism.
• However, for second sampling 13-21% of infants have failed to meet the extended target of 26 days during the past 13 years.
• Strategies are needed to reduce the interval between first and second sampling. These include the compulsory use of either email or telephone when second samples are required.

REFERENCES