Section: Pediatrics

Original Research Article

A STUDY OF CONGENITAL HYPOTHYROIDISM SCREENING BY UMBILICAL CORD BLOOD TSH IN A TERTIARY CARE HOSPITAL, EAST INDIA- A PROSPECTIVE, OBSERVATIONAL, COHORT STUDY

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Received *: 14/06/2026*
Received in revised form *: 12/07/2026*
Accepted *: 25/07/2026*

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DOI: 10.70034/ijmedph.2026.3.717

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 4643-4644

ABSTRACT

Background: Congenital hypothyroidism is one of the most common preventable causes of mental retardation. Early detection through newborn screening allows timely treatment.

Materials and Methods: This prospective cohort study was conducted from January 2014 to June 2015 in the Department of Pediatrics, a Tertiary Care Hospital in East India. 453 term newborns were enrolled. Umbilical cord blood TSH was measured at birth. TSH >20 mIU/L was considered positive and babies were recalled on day 3-7 for confirmatory serum TSH and T4.

Results: A total of 453 newborns were screened. The incidence of congenital hypothyroidism was 1 in 226.5 live births. 2 cases were confirmed and treatment with levo thyroxine was started within 14 days of life.

Conclusion: Cord blood TSH screening is feasible and effective for early detection of CH. The incidence in our study was higher than the reported national average, highlighting the need for universal newborn screening.

Keywords: Congenital hypothyroidism, newborn screening, cord blood TSH, incidence.

INTRODUCTION

Congenital hypothyroidism is one of the most common preventable causes of intellectual disability. The incidence varies globally from 1:3000 to 1:4000. In India the reported incidence is 1:600 to 1:1700. Early diagnosis and treatment within the first 2 weeks prevents neurodevelopmental deficits. Delayed treatment leads to irreversible cognitive impairment.

Cord blood TSH measurement at birth is an alternative to newborn heel-prick screening, especially in settings with early discharge.

MATERIALS AND METHODS

Study design: Prospective observational cohort study

Study period: January 2014 to June 2015

Study place: Department of Pediatrics, A Tertiary Care Hospital, East India

Study population: 453 term newborns delivered in the hospital

Sample size: 453

Inclusion Criteria: Term newborns >37 weeks gestation delivered in hospital

Exclusion Criteria: Preterm <37 weeks, VLBW <1500g, major congenital anomalies, NICU admission, parental refusal

Method: After obtaining informed consent, umbilical cord blood was collected at birth in plain vial for TSH estimation. Serum TSH was measured by chemiluminescence assay. Cut-off value >20 mIU/L was considered screen positive. All screen positive babies were recalled on day 3-7 for confirmatory venous serum TSH and free T4. Confirmed cases were started on levothyroxine. Ethical approval was obtained from Institutional Ethics Committee.

Statistical Analysis: Data was entered in MS Excel and analyzed using SPSS. Descriptive statistics were used.

RESULTS

A total of 453 newborns were enrolled during the study period.

Table 1: Gender Distribution of Study Population (n=453)

Male: 232 (51.2%)

Female: 221 (48.8%)

No significant difference by gender, p=0.9660

Out of 453 screened, 2 newborns were confirmed to have congenital hypothyroidism on repeat testing.

Incidence of CH: 1 in 226.5 live births

Both confirmed cases were started on levothyroxine treatment within 14 days of life.

DISCUSSION

The incidence of congenital hypothyroidism in our study was 1:226.5, which is higher than the national estimate of 1:600-1700 reported from India. Cord blood screening offers advantage of 100% coverage as it is collected at birth, solving the problem of early discharge and missed heel-prick samples.

Similar studies from other parts of the world have shown variable incidence. Our higher incidence highlights the need for universal newborn screening program in India.

Limitations of this study include single center data and short study duration.

CONCLUSION

Cord blood TSH is a feasible and effective method for newborn screening in hospital settings. Given the high incidence detected in our study, universal screening should be considered to prevent neurodevelopmental disability.

Acknowledgements: None

Conflict of Interest: None declared

Funding: None

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