**Disclosure Statement**
Nothing to disclose

P2 552


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# Even in the era of congenital hypothyroidism screening mild and subclinical sensorineural hearing loss remains a relatively common complication of severe congenital hypothyroidism


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## Background

Only few studies have focused on neurosensory hearing function of patients with congenital hypothyroidism (CH) identified by CH screening programs and treated early and, therefore, this issue remains still controversial

**The aim of this study** was to ascertain whether an early and adequate replacement treatment may be able to prevent sensorineural hearing loss in **32** screened children with CH and no associated risk factors for neuro-otologic alterations. These patients were recruited according to highly selective criteria aiming to preliminarily exclude the negative interference of both treatment variables and other underlying risk factors.

## RESULTS

All the selected patients underwent, at a median age of 15.4 years, an audiologic investigation, which evidenced **a mild and subclinical hearing loss in 25%** of them. The poorest hearing scores were recorded in the individuals with **athyreosis** and in those **with absence of distal femur bony nucleus at CH diagnosis**. The prevalence of hearing impairment was significantly higher in CH patients than in 32 age-matched control subjects with no thyroid problems and no clinical suspect of hearing impairment (25 vs 3.1%; $\chi2 = 6.3$, $p < 0.025$). Also the prevalence of hearing impaired ears was significantly higher in CH group (20.3 vs 3.1%; $\chi2 = 9.1$, $p < 0.0025$).

| | At CH diagnosis | | | | | At audiologic investigation | | | |
|---|---|---|---|---|---|---|---|---|---|
| Patients | Therapy onset (days) | Serum TSH (mIU/l) | Thyroid scanning | Distal femur nucleus | L-T4 dose (µg/kg/day) | Age (years) | Max hearing loss (Db) | Hearing loss (Db) at other frequencies (Hz) | Hearing loss presentation |
| 1 | 8 | 180 | athyreosis | absent | 10.00 | 19.6 | 35 at 8000 Hz | 25 at 6000 | bilateral |
| 2 | 16 | 535 | athyreosis | absent | 10.08 | 17.5 | 30 at 8000 Hz | - | bilateral |
| 3 | 19 | 426 | ectopy | present | 10.02 | 15.5 | 30 at 6000 Hz | 25 at 8000 | monolateral |
| 4 | 28 | 449 | ectopy | absent | 10.56 | 9.3 | 30 at 8000 Hz | - | bilateral |
| 5 | 29 | 420 | athyreosis | absent | 11.00 | 16.7 | 40 at 8000 Hz | 25 at 4000; 35 at 6000 | bilateral |
| 6 | 30 | 210 | ectopy | present | 10.05 | 15.4 | 30 at 4000 Hz | - | monolateral |
| 7 | 30 | 260 | athyreosis | absent | 12.00 | 15.6 | 30 at 8000 Hz | - | bilateral |
| 8 | 30 | 280 | athyreosis | absent | 10.63 | 17.9 | 25 at 8000 Hz | - | monolateral |

## CONCLUSIONS

a) **25% of CH patients detected by CH screening** may show, at a median age of 15.4 years, a **mild and subclinical hearing impairment**, despite early and adequate replacement treatment;
b) **the risk of hearing loss is higher in CH young patients than in age-matched control** subjects without thyroid problems;
c) the risk of hearing loss is closely associated with the severity of CH;
d) this risk is particularly relevant in the children with **pre-natal onset of hypothyroidism**.


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