

Hearing symptoms in children and adolescents

Tinnitus and temporary threshold shift

Jolanta Anna Juul

Department of Clinical Neuroscience and Rehabilitation
Institute of Neuroscience and Physiology
Sahlgrenska Academy at University of Gothenburg, Sweden

ABSTRACT

This thesis has assessed the prevalence of spontaneous tinnitus (ST), noise-induced tinnitus (NIT) and temporary threshold shift (TTS) in children and adolescents as well as investigated some of the audiometric, medical and psychological characteristics of young subjects with tinnitus. Additionally, long-term effects of noise exposure were examined in relation to ST, NIT and TTS. The methods employed included hearing measurements, tinnitus specific questionnaires to assess the prevalence of ST, NIT and TTS and Hospital Anxiety and Depression Scale to assess symptoms of mood disorders. Paper I reported the prevalence of ST as 46% and NIT as 53%, among 274 investigated schoolchildren (ages 9-16 years; 135 girls, 135 boys). Secondly, the characteristics of 95 consecutive young patients (55 boys and 40 girls) with tinnitus were also explored in Paper I. The onset of tinnitus was most often sudden and, in 54% of the subjects, preceded by noise exposure, predominantly music. The severity of tinnitus correlated to a deterioration in high frequency pure tone average of hearing thresholds and to possible depression or anxiety (r+p). Paper II reported the tinnitus prevalence in 756 seven-year olds as 40.8% among the normal hearing population and 58% among children with hearing loss. Paper III investigated 1105 16-17 year old students in their first and their last year of high school. Results demonstrated NIT in 55% of the students and ST in 33% of the students in the first, and 37% in the last year. Those with tinnitus reported higher scores for HAD-anxiety. The leisure activity most associated with ST, NIT and TTS was playing instruments and attending concerts. This thesis has presented results demonstrating the connections between tinnitus in children and adolescents, signs of incipient hearing impairment, particularly in the high frequency regions, noise exposure (predominantly from live and amplified music) and anxiety symptoms.

Keywords: Adolescent, child, tinnitus, hearing loss, noise, stress, anxiety

ISBN: 978-91-628-8642-4 <http://hdl.handle.net/2077/32376>

Hearing symptoms in children and adolescents

Tinnitus and temporary threshold shift

Akademisk avhandling som för avläggande av medicine doktorsexamen vid Sahlgrenska Akademin vid Göteborgs Universitet kommer att offentligens försvaras i Jubileumsaulan, Gula Stråket 2B, Sahlgrenska Universitetssjukhuset/Sahlgrenska, Göteborg, torsdagen den 2 maj 2013 kl 09.00

av

Jolanta Anna Juul
Leg. läkare

Fakultetsopponent:

Docent Åke Reimer
Avdelningen för Audiologi, Medicinska fakulteten, Lunds Universitet

Avhandlingen baseras på följande delarbeten:

- I. Holgers, K. M. and J. Juul. The suffering of tinnitus in childhood and adolescence. *Int J Audiol* 2006;45: 267-272.
- II. Juul J, Barrenäs ML, Holgers KM. Tinnitus and hearing in 7-year-old children. *Arch Dis Child* 2012;97:28-30.
- III. Juul J, Holgers KM. Tinnitus in adolescents – intrinsic and extrinsic factors. *In manuscript, submitted*



UNIVERSITY OF GOTHENBURG