

CORRESPONDENCE BETWEEN CENTRAL AUDITORY PROCESSING DISORDERS AND LEARNING DIFFICULTIES IN 3RD GRADE STUDENTS

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Abstract

The article concerns results of research conducted on central auditory processing disorders (CAPD), learning difficulties and relations between them. The study group were 64 3rd grade students of elementary school of normal intellectual capacity and not affected by any hearing loss. 65 per cent of the students were diagnosed with the central auditory processing disorder and 30 per cent of them had learning difficulties. Research conducted shows, that there is a clear link between the occurrence of CAPD and learning difficulties in 3rd grade students of elementary school. One third of students with CAPD shows corresponding learning difficulties. The reason for learning difficulties in 3 out of 4 tested students may be CAPD.

Key words: central auditory processing disorders (CAPD) • auditory perception • learning difficulties

Background

Frequently occurring ear diseases, omnipresent noise and exposure to loud music have a negative influence on the quality of auditory perception, especially as far as young people are concerned. Problems with speech comprehension and auditory concentration may negatively influence their performance at school [1–3]. Frequent occurrence of pronunciation disorders accompanied by central disorders was previously described, which confirms correspondence between these disorders [2]. Thus, in order to prevent its serious complications, we should address the problem of central auditory processing disorders.

Material and methods

There has been a research on how central auditory processing disorders and learning difficulties are related. The study group included 64 3rd grade students of elementary school – 40 girls and 24 boys. They were of normal intellectual capacity and were not affected by any hearing disorders.

The first area of research concerned auditory concentration, ability to define timing of the sounds, speech comprehension in white noise and the ability to discriminate between sounds of different frequencies and durations. Tests administered: Dichotic Digits Test (DDT), Gap Detection Threshold (GDT), Speech In Noise Test (SIN), Frequency Pattern Test (FPT) and Duration Pattern Test (DPT).

Learning difficulties were understood as problems with acquiring literacy and numeracy as well as problems with learning foreign languages. They were tested with two authorial questionnaires, first of which, concerning general learning difficulties, was directed to teachers, who teach them every day, the other was directed to foreign language

teacher. They were asked about the types of difficulties, pronunciation problems and learning skills.

Results

In the study group, 40 students were diagnosed with the central auditory processing disorder, which constitutes 62.5 per cent of all tested students (Figure 1). The two most frequently disturbed processes were the discrimination of sound frequencies in Frequency Pattern Test and speech comprehension in unfavourable acoustic conditions in Speech In Noise Test. Negative results of these two tests were often related to the difficulties with conducting other central tests. Subsequent tests revealed the number of children affected by the following disorders: problems with discrimination of sound duration in Duration Pattern Test and auditory concentration in Dichotic Digits Test. The students had least difficulties during tests of the ability to define timing of the sounds in Gap Detection Threshold.

Questionnaires revealed that 28 per cent of the 3rd grade students of elementary school have learning difficulties (Figure 2). Every fourth subject has reading and writing problems, and every sixth has difficulties in learning a foreign language. The students have least difficulties with counting/numeracy. An additional questionnaire confirms the incidence of difficulties in foreign language learning. Students from the group with learning difficulties have the greatest problem with acquiring literacy and foreign language learning and the least with pronunciation.

Learning skills in the case of most students tested were assessed by teachers as good and very good. No students were found to have too poor skills to continue education.

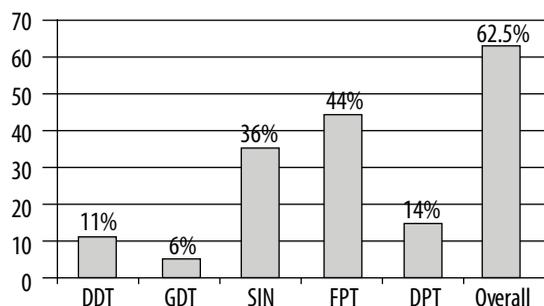


Figure 1. Occurrence of CAPD in tested students.

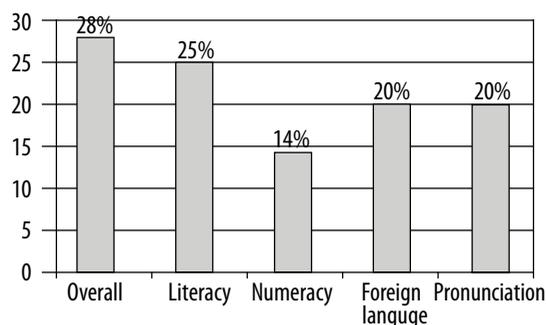


Figure 2. Occurrence of learning difficulties in tested students.

Discussion

In the result of research the occurrence of central auditory processing disorders is a few times higher in comparison with the data presented in the reference books [1,4]. Also most publications on the central auditory processing disorder suggest that it occurs two more frequently in boys than in girls [4]. Nevertheless, the results of tests show lack of differences in occurrence of this type of disorders with respect to gender. Central auditory processing disorders were diagnosed in 60 per cent of girls and in 67 per cent of boys.

Among the students with learning difficulties almost three-fourth also have central auditory processing disorders. It is best observable in problems with numeracy. There is a slightly weaker correlation between central auditory processing disorders and difficulties with foreign language learning and pronunciation. Reading and writing difficulties correlate with central auditory processing disorders to the extent similar to that of general difficulties (Figure 3).

On the other hand, in the group with central auditory processing disorders, every third student also has learning difficulties. Most often are difficulties in reading and writing, foreign language learning and incorrect pronunciation (Figure 4).

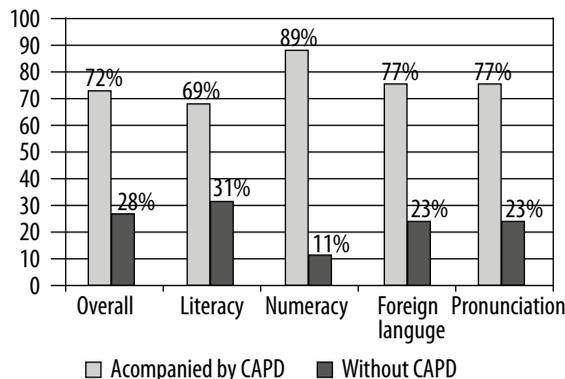


Figure 3. Occurrence of CAPD in tested students with learning difficulties.

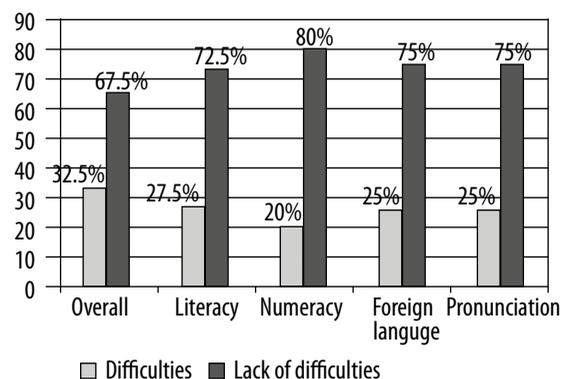


Figure 4. Occurrence of learning difficulties in tested students with CAPD.

Conclusions

Results of the research conducted show that there is a correspondence between central auditory processing disorders and learning difficulties of 3rd grade students of elementary school. It has been noticed, that only one third of the students with central auditory processing disorders has accompanying learning difficulties. It may suggest great compensation skills of the rest of the group. It has been observed that the cause of learning difficulties 3 out of 4 tested students may be CAPD. In our subject group, central auditory processing disorders have substantial impact on foreign language learning, which is proved by a 70 per cent correspondence between their occurrence. Confirmation of tests for central auditory processing disorders is important and they should be continued, as this problem hasn't been properly examined, and further negligence may lead to the increase of learning difficulties of students with central auditory processing disorders.

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