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## UNILATERAL SENSORINEURAL HEARING LOSS IN SCHOLASTIC AGE SUBJECTS: PSYCHOPE- DAGOGICALASPECTS

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*[Sordità monolaterale neurosensoriale in soggetti di età scolare: aspetti psico-pedagogici]*

### SUMMARY

The Authors want to assess a probable significant relation between the unilateral sensorineural hearing loss and some learning difficulties and language acquisitions, often found, through our observation, in impaired children

The Authors have examined a group of subjects in their scholastic age who have this kind of hearing loss and, through several dialogues with them, they have gathered some relevant data about the difficulties that children have at school, and drawn up a questionnaire.

### RIASSUNTO

*Gli AA. intendono valutare se esiste una relazione signifi-  
ficativa fra la sordità neurosensoriale monolaterale ed alcuni  
disturbi di apprendimento e di acquisizione del linguaggio  
spesso evidenziati nei bambini con questo deficit uditivo giunti  
alla nostra osservazione.*

*Gli AA. hanno esaminato un gruppo di soggetti di età  
scolare, con la suddetta sordità, e tramite colloqui hanno  
dedotto alcuni dati sulle difficoltà in ambito scolastico ed ela-  
borato un questionario.*

**Key words:** Unilateral deafness, classrooms

**Parole chiave:** Sordità monolaterale, aule scolastiche.

### Introduction

The purpose of this research is to take into consideration the consequences of the unilateral hearing loss on the psychological level as well as on learning in scholastic age subjects. In particular, the Authors want to found out if some difficulties, shown by children at school (such as learning difficulties, difficulties in the dictation and/or in reading, dyslexia) or in their behaviour (absent-mindedness, difficulties in social relationships) are due to the unilateral sensorineural hearing loss or if they just coexist.

For several years unilateral hearing loss in children, and even anacusia, have been underestimated, as they did not request a particular clinical and rehabilitative attention. They did not even found particular indications towards the air conduction hearing aid (Cianfrone and Turchetta, 2003)<sup>(1)</sup>.

The already known consequences due to the loss of the binaural auditis are:

- difficulties in the lateralization of sounds;
- difficulties in the localization of noises;

▪ difficulties in diverting the meaningful signal in a noisy environment, because of an unfavourable relationship signal/noise;

▪ disorder in lateral inhibition processes and of the efferent olive-cochlear-colliculus on a normal ear and in the central masking processes.

Considered that unilateral deafness, even if very serious, does not imply the missing linguistic development, it cannot be underestimated that, in a noisy environment where subjects are able to distinguish the signal coming from the basic noise, there can be a “disintegration of the verbal perception”.

Such a situation happens very often in the classrooms where the sound level may be higher than 45-55 db (Picard et al., 2001)<sup>(2)</sup> and there can be the sonorous reverberation phenomenon (Nabelek et al., 1994)<sup>(3)</sup>.

According to Pollazon et al. (1985)<sup>(4)</sup> this could cause a retard in the language acquisition during the developmental age, as it injures the potentialities and the capability of hearing.

In literature there are contrasting opinions about the effects of unilateral hearing loss on child’s cognitive and relational development.

It is a widespread opinion that unilateral hearing loss does not involve serious consequences as children can face this kind of impaired hearing thanks to the normoacousia of the counter lateral ear and to some expedients of daily life as well as at school.

On the contrary, some Authors underline the seriousness of the consequences of unilateral hearing loss that could cause a retard in children's psycho-intellectual capabilities.

According to other Authors (Konkle and Schwartz, 1981)<sup>(5)</sup> the function of performance in noisy environments, such as the scholastic ones, is reduced as it is the capacity of establishing meaningful relationships with children of the same age and with the surrounding environment.

According to Brookhauser et Al., (1991)<sup>(6)</sup> there is a high percentage of cases with a meaningful retard in the language development.

A further cause of uneasiness is due to the delay, from its outbreak, by which it is diagnosed the unilateral hearing loss (Grisanti et al., 1991)<sup>(7)(8)</sup>.

In fact, when the unilateral deafness of the child has not been diagnosed yet, parents and teachers are led to the erroneous conclusion that the cause for their child's easy distraction and attention difficulties lies in temperament factors rather than in real hearing problems.

## Materials and methods

One of the first phases of the research consisted in the realization of a questionnaire that allowed to point out probable outbreaks of relational and learning difficulties due to the unilateral deafness.

The questionnaire that was drawn up, is made up of three parts, filled in, according to the patient's age, by the parents or by the subject itself.

The first part of the questionnaire concerns the gathering of personal and anamnestic data such as age, period of the deafness outbreak, deafness gravity, and so on. The second part investigates on eventual difficulties pointed out during the language development and in the present communication.

The third part, specific for children in pre-scholastic age and for those ones attending elementary school or high school, is referred to the learning and social behavioural areas.

Moreover, all the patients drew a free drawing and they had an interview with the psychologist or with the psycho-educationalist.

## Sample of research

The Authors examined a group of 15 subjects affected by unilateral sensorineural deafness who were at the Audiology Section of the Department of Medical Biotechnologies and Forensic Medicine of the University of Palermo, for their periodical hearing checks, in a period that goes from January 2000 to June 2003.

The sample group, consisting of 11 males and 4 females, is heterogeneous according to age and different scholastic distribution. Three children are between 4 and 5 years old and attend the kindergarten; 5 children are between 6 and 8 years old and attend the elementary school, and 7 teenagers are between 11 and 18 years old, attending grammar school or high school.

The subjects have a deep unilateral sensorineural deafness or unilateral anacusia, in 46% of cases it concerns the right ear and in 54% the left one.

Only a selected subject wears a prosthesis and two subjects are working with a speech therapist.

## Results

The diagnosis of unilateral deafness was carried out lately.

In 60% of cases it was carried out in an age between 3,5 and 5 years and in 40% of the cases between 6 and 10 years.

As they do not carry out early diagnostic tests such as the Boel Test, the lack of diagnostic precociousness is due to the fact that the unilateral deafness is in part supplied by the good function of the counter lateral ear.

The suspect for deafness, in fact, turns up when the child has already established active social relationships and the tasks he was asked to do require more and more accuracy and attention. In these situations, parents more probable realize that their son may have a hearing impairing.

In 60% of cases, parents report that their suspect for a hearing impairing rose because the child often seemed not to hear well when being in a group or in a noisy environment. Moreover, he also was inclined to turn on the television volume.

In 33% of cases, parents became suspicious because their child always preferred the same ear when answering the phone.

In the remaining 6% of cases the diagnosis was carried out after a series of clinical examinations as a consequence of cranial trauma.

We put other statistic data in our report:

66% of parents declare that their son has not shown any problem or retard in the linguistic development and any communication difficulty both in the dyadic situation and in a group or in a noisy environment.

33% of parents report that their son has a slight difficulty in pronunciation or a retard in language acquisition and shows some difficulties within the group communication or in a noisy environment.

The remaining 13% of examined subjects (two cases) followed a speech therapy.

As concerns some habits in the daily life, it was pointed out that all the examined subjects only use the counter lateral ear to talk on the phone, 46% of them always turn their head on the same side when called, 20% show some difficulties in locating noises, 40% report that the comprehension of the conversation is interfered if there is a basic noise, 33% of cases, when sleep, turn their head on the pillow from the side where they do not hear and 20% of subjects seem to be absent-minded while carrying out everyday activities or during the tasks they were asked to do.

As concerns socialization, there are not problematic situations.

## Conclusions

The research, proposed by the Authors, wants to verify, through the questionnaire that was proposed, which variables can amplify the negative consequences of unilateral sensorineural deafness on the psychic-cognitive development and on children scholastic success. It also aims at finding out the educational strategies and the interventions on the surrounding environment in order to reduce eventual difficulties.

The Authors aim at widening the sample of the research and supply an up-to-date data regarding some problems linked to the unilateral deafness in children, not only through the provision of the questionnaire we proposed, but also through conversations with parents and teachers who often are the first people that point out their pupils' difficulties.

The data we gathered here could offer an useful suggestion about the choice of some strategies of intervention (for example, the use of scholastic devices of frequency modulation, but above all to avoid competitive sound messages or simultaneous verbal ones) aiming at reducing the damages caused by unilateral hearing loss.

Nowadays, this can be made by using a system of transmission, a "wireless" or "bluetooth" type, so that the impaired children can catch the teacher's verbal messages and avoid, in this way, the distance between teacher and pupil (this, according to Nabeleck et al., 1994, cuts to 6 db the verbal message efficacy for each metre of distance)<sup>(3)</sup>.

Finally, it encourages the reduction of the undesired environmental noises.

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