

Evaluation of the benefit of amplification in children fitted with hearing aids

Avaliação do benefício do uso de aparelhos de amplificação sonora individual em crianças

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SUMMARY

Introduction: In Brazil, it is rare studies with using deaf children of auditory device above of seven years.

Objective: To investigate the benefit supplied for the amplification in deaf children to 7 years old to 11 years old using auditory device, under the perspective of the proper child and the adults with who it more coexists, and to verify if the time of conviviality of the adults with the child intervenes with their answers.

Method: One is about a clinical and experimental study. They had participated of the study 48 citizens, divided in 4 distinct groups: G1- 12 deaf children; G2- 12 adults with average companionship of 40 weekly hours with the deaf child; G3- 12 adults with average companionship of 20 weekly hours with the deaf child; G4- 12 adults with average companionship of 10 weekly hours with the deaf child. All the children were using of device bilaterally and presented auditory loss of severe or deep degree.

Results: The results indicate damage in the auditory abilities of the children evaluated had to the difficulties faced for them to listen to elements gifts in situations of its daily one. The time of companionship with the child did not have differences in the results between the different groups in agreement.

Conclusion: The viability of the evaluation of the proportionate benefit for the auditory device in children was evidenced clinically on the basis of the information of the family. The device of individual sonorous amplification exerted influence in the auditory abilities of the evaluated children, although the proportionate benefit for its use to be lesser of what the waited one.

Keyword: deafness, child, evaluation.

RESUMO

Introdução: No Brasil, são raros estudos com crianças surdas usuárias de aparelho auditivo acima de sete anos.

Objetivo: Investigar o benefício fornecido pela amplificação em crianças surdas de sete a 11 anos usuárias de aparelho auditivo, sob a perspectiva da própria criança e dos adultos com quem ela mais convive, e verificar se o tempo de convívio dos adultos com a criança interfere em suas respostas.

Método: Trata-se de um estudo clínico e experimental. Participaram do estudo 48 sujeitos, divididos em 4 grupos distintos: G1- 12 crianças surdas; G2- 12 adultos com convivência média de 40 horas semanais com a criança surda; G3- 12 adultos com convivência média de 20 horas semanais com a criança surda; G4- 12 adultos com convivência média de 10 horas semanais com a criança surda. Todas as crianças eram usuárias de aparelho bilateralmente e apresentavam perda auditiva de grau severo ou profundo.

Resultados: Os resultados indicam um prejuízo nas habilidades auditivas das crianças avaliadas devido às dificuldades enfrentadas por elas para escutar elementos presentes em situações de seu cotidiano. Não houve diferenças nos resultados entre os diferentes grupos conforme o tempo de convivência com a criança.

Conclusão: Constatou-se clinicamente a viabilidade da avaliação do benefício proporcionado pelo aparelho auditivo em crianças com base nas informações da família. O aparelho de amplificação sonora individual exerceu influência nas habilidades auditivas das crianças avaliadas, apesar do benefício proporcionado pelo seu uso ser menor do que o esperado.

Palavras-chave: surdez, criança, avaliação.

INTRODUCTION

The technological advance of the systems of amplification, in specific the device of individual sonorous amplification (AASD), has brought the necessity to evaluate the resultant impact of these resources in the auditory abilities of its users as well as in the services given for the programs of audiologic rehabilitation (1, 2). Questionnaires and scales of evaluation of the auditory abilities have been widely used with this objective, for being of easy application and the same allowing the accomplishment of longitudinal studies with the use of instrument in different stages of the therapeutically process (3).

Amongst the methods that consider the perspective of the user in the evaluation of the benefits of the amplification, auto-evaluation instruments exist, which in its majority, directed the adult and aged population. The related to the available auditory difficulties for children and adapted questionnaires of evaluation for the Portuguese concentrate in the age group of zero the seven years of age and are directed its parents: The Meaningful Auditory Integration Scale - MORE (4, 1); The Infant-Toddler Meaningful Auditory Integration Scale - IT-MAOR (5, 6). Related studies the children above of this age group and that they still consider the perspective of the proper child are scarce (7).

The linguistic development of the deaf child follows the same periods of training that of a child listener, either in the verbal or visual modality (language of signals). However, due to interference of the auditory sensorial privation in the acquisition of the verbal language, the deaf children, children of parents listeners - that they are not displayed to the language of signals since the birth, as occurs with the deaf children, children of deaf parents - generally reach the pertaining to school phase without possessing a systemize language. From there the difficulty in having access such population by means of questionnaires appears (8, 9, 10, 11).

It is important to stand out that the beneficiaries of the auditory device are not only the users, but also all those that suffer to limitations in activities and restrictions from participation in reason of the existence of a involved deaf person in the action or task. That is, familiar and the too much people who also coexist an user of auditory device are beneficiary of this product and, as such, they search evidences of that it will promote an improvement in the auditory abilities as a whole (12, 13).

In reply to this, the Institute of Audiologic Research developed the LSQ - Listening Situations Questionnaire (14). Later, APPLETON and BAMFORD (15) had used this questionnaire in a research with 16 deaf children with auditory loss daily

pre-linguistic in the age group of 7 to the 11 years, and the respective parents. The study compared the degree of auditory difficulty told by the children and observed by the parents. In the majority of the cases, the children had told to minor difficulty with regard to the auditory abilities of what she was observed by the adults. The authors had argued if the differences in the answers between parents and children must to the fact of the parents overestimate the difficulty of the children or the children not to confer as much importance to the difficulty who feel a time that does not possess an experience that serves of parameter for the comparison of the degree of the difficulty. The situations proposals in the LSQ evaluate the auditory abilities of the child to detect, to discriminate, to recognize and to understand says and some sonorous signals to it of alert or social conviviality, considering in the distance of the sonorous source (localization) and the presence or not of noise (figure-deep).

Considering that the auditory difficulty generates restrictions of participation to the child in diverse activities of the daily one and the LSQ is an instrument that measures the auditory abilities, is inferred that the use of the auditory device will be able to promote changes in the auditory abilities of the deaf child (2, 16).

The objectives of the present study had been: to investigate the benefit supplied for the amplification in deaf children of 7 to the 11 years that uses the auditory device, under the perspective of the proper child and the adults with who it more coexists; e to verify if the time of conviviality of the adults with the child intervene with its answers.

METHOD

It is about a clinical, observational and transversal study, approved in August 24th of 2007 for the Commission of Ethics for Analysis of Projects of Research - CAPPesq of the Clinical Direction of the Hospital of the Clinics and the College of Medicine of the University of São Paulo (protocol #0601/07).

Casuistry

The research was carried through with 12 families of deaf children in the age group of 7 to the 11 years. All the children were using auditory device bilaterally and presented auditory loss of severe degree the deep one. All the citizens were using of auditory device have three years more than and the average of the time of use of the device was five years (Table 1).

The citizens whose preferential communicative modality was the language of signals totalized seven

Table 1. Characterization of the deaf children.

Citizens	Gender	Age	Degree of the Auditory Loss	Time of use of AASI	Linguistic period of training (Pictures, 1997)
1	F	11 years	severe	7 years	O: Multiple Combinations S: Simple Combination
2	M	8 years	deep	5 years	O: Pre-linguistic S: Multiple Combinations
3	F	7 years	deep	4 years	O: Pre-linguistic S: Multiple Combinations
4	F	7 years	deep	6 years	O: Stage of 1 word S: Simple Combination
5	F	9 years	severe	4 years	O: Multiple Combinations S: Pre-linguistic
6	M	7 years	deep	6 years	O: Simple Combination S: Multiple Combinations
7	M	8 years	severa	4 years	O: Multiple Combinations S: Stage of 1 signal
8	M	11 years	deep	7 years	O: Stage of 1 word S: Multiple Combinations
9	M	7 years	deep	5 years	O: Simple Combination S: Simple Combination
10	M	9 years	deep	5 years	O: Pre-linguistic S: Simple Combination
11	M	8 years	deep	4 years	O: Stage of 1 word S: Multiple Combinations
12	M	10 years	severe	5 years	O: Multiple Combinations S: Pre-linguistic

Legend: The verbal language; S - language of signals.

children, all with auditory losses of deep degree. Between the citizens whose preferential communicative modality was the verbal language, of a total of five children, four (80%) presented auditory losses of severe degree, and only one child (20%) presented loss of deep degree.

48 citizens had participated of the study, which had been divided in four distinct groups: C1- 12 deaf children; A1- 12 adults with average coexistence of 40 weekly hours in relation to the deaf child; A2- 12 adults with average coexistence of 20 weekly hours in relation to the deaf child; A3- 12 adults with average coexistence of 10 weekly hours in relation to the deaf child.

The age group of the adults varied of 19 the 73 years (average of 40 years), of which 24 (66.7%) were of feminine sex and 12 (33.3%) of the masculine sex (Table 2).

How much to the proximity or degree of kindred, 11 adults of the A1 group were mothers (91.7%), and only one citizen (8.3%) was father of the deaf child. In the A2 group, 10 adults were parents (83.4%), one was friend of the family (8.3%) and an age godmother of the child (8.3%). In the A3 group, it had four grandmothers (33.4%),

two friends of the family (16.8%), a sister (8.3%), a neighbor (8.3%), an aunt (8.3%), a cousin (8.3%), a phonoaudiologic (8.3%) and a teacher (8.3%).

Already how much to the schooling degree, 60% of the adults were of basic level (less than nine years of study), 20% of average level (the nine to twelve years of study) and 20% of superior level (above of twelve years of study).

The used criteria of inclusion in this study had been:

- Pertaining to school children with age group between 7 years to the 11 years and 11 months; inserted in intervention bilingual program; with sensorineural auditory loss of severe or deep degree; AASI users have one year at least, in order to guarantee its experience of use; pertaining the families of listeners, therefore in the questionnaire had been observed situations that used to be part of the routine of families listeners, as to hear music and to speak to the telephone; minimum time of daily use of the devices of eight hours.
- Adults with age group above of 18 years of age; listeners; time of coexistence with the equal or superior child the ten weekly hours. In the absence of familiar

that they satisfied the criteria demanded for participation in the research, other adults had been invited who coexisted in agreement child the established criteria.

Had been considered as exclusion criteria:

- Children with commitments associates - neurological (syndromes, deficiencies or any another condition that generated a cognitive delay, a time that this would harm the understanding of the questions), appearance (blindness, low vision or vision subnormal, what AASI would hinder the correct manipulation it and would make it difficult the identification of the figures of the questionnaire), emotional (depression/ hyperactivity, to guarantee the contribution of the child);
- Children who did not attend school (a time that one of the factors analyzed in the research was the proportionate benefit for the AASI in the pertaining to school environment).

Material

The Questionnaire of Situations of Hear was used (LSQ) - version for children (14) and version for parents (17). This questionnaire was translated and adapted for the Brazilian Portuguese as the norms of the Scientific Advisory Committee of Medical Outcomes Trust (18,19) and currently meets in validation phase. It understands ten situations related to the common auditory difficulties to the majority of the deaf children, namely: to hear what is said by the professor in a noise classroom; to hear the instructions of an adult in external environments; to hear the bell or the touch of the telephone when he is in another one room of the house; to hear the sound of vehicles if approaching; to talk with some children in a classroom; to hear television with other people; to hear alone television; to hear music; to hear what it is said in the telephone; to hear the sound of the buzzer of an ambulance. For each situation, three questions are made: a) how much this situation is important for the child; b) which the frequency where it occurs; c) how much difficulty the child presents in this situation (scores of difficulty).

For each one of the three items of the LSQ had four possibilities of reply, which varied of 1 to 4 points, in accordance with the importance/frequency/degree of difficulty of the ten presented situations. The maximum total score for this questionnaire was of 120 points, and the minimum, 30 points. How much bigger is the score, greater the difficulty faced for the child and, consequently, less its auditory abilities (15).

The score of difficulty was determined by the addition of the punctuations gotten in item C of each question. The maximum score was of 40 points, and

Table 2. Characterization of the adults.

	Citizen	Sex	Age	Degree of kindred/ Proximity
Child 1	A1	F	34	Mother
	A2	M	35	Father
	A3	F	42	Aunt
Child 2	A1	F	29	Mother
	A2	M	37	Father
	A3	F	53	Grandfather
Child 3	A1	F	29	Mother
	A2	M	37	Father
	A3	F	53	Grandmother
Child 4	A1	F	31	Mother
	A2	M	35	Father
	A3	F	60	Grandmother
Child 5	A1	F	43	Mother
	A2	M	56	Father
	A3	F	23	Sister
Child 6	A1	F	41	Mother
	A2	F	30	Godmother
	A3	F	28	Phonotherapeutic
Child 7	A1	F	25	Mother
	A2	M	30	Father
	A3	F	73	Grandmother
Child 8	A1	F	28	Mother
	A2	M	42	Father
	A3	F	34	Neighbor
Child 9	A1	F	44	Mother
	A2	M	44	Father
	A3	F	38	Woman Friend
Child 10	A1	M	45	Father
	A2	M	56	Man Friend
	A3	F	59	Woman Friend
Child 11	A1	F	39	Mother
	A2	M	41	Father
	A3	F	19	Cousin
Child 12	A1	F	45	Mother
	A2	M	43	Father
	A3	F	27	Teacher

Legend: A1 - adult 1; A2 - adult 2; A3 - adult 3.

minimum ten. In the cases where the child did not use the auditory device in definitive situation, she asked herself if the child did not use it for presenting much difficulty in this situation (4 points), or for it not to have difficulty (1 point).

By the APPLETON and BAMFORD (15), superior total scores to 100 points indicate the necessity of revision of the device and score of difficulty above of 22 demands the analysis of the situations where the child presents more difficulty, associated with a detailed revision of the functioning of the device. Scores of difficulty is closely on to the benefit offered for the auditory device, being that high scores

disclose the existence of obstacles in the execution of activities considered excellent in the daily one of a child.

It is considered, therefore, that the benefit supplied for the amplification is adjusted when there is total score below of 100 points and props up of inferior difficulty the 22 in the LSQ (Table 3).

After the signature of the assent term (Annex1), the questionnaire was managed with deaf child and, in the sequence, with three adults whom the child coexisted. In the cases of the deaf children whose preferential communicative modality was the language of signals, the application of the questionnaire was made in Brazilian Language of Signals (LIBRAS). For in such a way, the researcher received the training from a deaf professor. For the children who found in the initial periods of training of the verbal language, one used the figures of the questionnaire to facilitate to its understanding, requesting itself it the child who pointed the chosen option.

It was opted to managing the protocol in the residences of the citizens in order to offer to greater comfort to the families and to uninhibited the child, a time that being outside of the therapeutically environment this would hold in more natural way, propitiating the comment of same in situations daily it and the familiar dynamics (20).

RESULTS

Auditory abilities in the perception of the children

There was great variability of answers for the item (how much the situation is important for the child). Perhaps this explains due to the character most personal of this question, generating bigger divergence between the answers given for the citizens. In item B (which the frequency where the situation occurs), had some divergences between the answers due the differences in the routine and familiar dynamics of the analyzed citizens. Already item C (difficulty presented for the child in the situation) had little divergence between the answers, what it is justified for the raised degree of auditory difficulty related by all the citizens (Table 4).

Two citizens (16.7%) had presented total scores above of the waited one in the LSQ. Already how much to score of difficulty, 11 citizens (91.7%) had gotten inadequate performance (Table 5).

Citizens 3, 10 and 11 had presented scores difficulty higher. But citizen 1 had score of adequate difficulty.

Tabela 3. Pontuações do LSQ segundo Appleton e Bamford (2006).

	Minimum	Maximum	Waited
TotalScore	30	120	Underthan 100
ScoreofDifficulty	10	40	below of 22

Table 5. Punctuation of the citizens for test.

Citizen	LSQTotalPunctuation	LSQScoreofDifficulty
1	84	19
2	75	29
3	90	34
4	103	32
5	83	32
6	95	30
7	96	27
8	72	24
9	79	29
10	98	39
11	108	40
12	91	30

*The data in boldface meet outside of the waited one.

Considering that total scores raised in the LSQ they disclose a reduction of the auditory abilities, it can be said that it had improvement of the auditory abilities in the majority of the analyzed deaf children, however still persists one high degree of difficulty in the different presented situations of listening.

Auditory abilities in the perception of the adults

In the comparative degrees between the members how much to the answers for question, test ANOVA with repeated measures was used, and it did not have statistical significant differences in none of the comparative degrees (Table 6).

Also it did not have statistical significant differences between the answers of the children and the adults and enters the three groups of adults (Table 7).

DISCUSSION

The majority of the citizens presented inside total scores of the waited one in the LSQ, however a deaf child only got score of adequate difficulty. This perhaps if must to the fact of it props up total to encompass other aspects (importance and frequency of the situations), which can have masked the difficulties faced for the children.

Table 4. Results of the group of deaf children how much to the answers for question.

Question	Medium	Shunting line-standard
1A – how much is important to hear what it is said by the professor in a noise room	2,93	1,398
1B – The frequency that occurs to have to hear what is said by the professor in a noise room	2,27	1,335
1C – how much difficulty feels to hear what it is said by the professor in a noise room	2,67	1,125
2A – how much is important to hear the instructions of an adult in external environments	2,73	1,223
2B – The frequency that occurs to have to hear the instructions of an adult in external environments	2,93	1,016
2C – how much difficulty feels to hear the instructions of an adult in external environments	3,13	,915
3A – how much important is to hear the touch of the telephone in another room of the house	3,13	1,125
3B – The frequency that occurs to have to hear the touch of the telephone in another room of the house	2,53	,915
3C – how much difficulty feels to hear the touch of the telephone in another one room of the house	2,80	1,163
4A – how much is important to hear the sound of vehicles approaching	2,87	1,125
4B – the frequency that occurs to have to hear the sound of vehicles approaching	2,73	1,100
4C – how much difficulty feels when hearing the sound of vehicles approaching	2,80	,941
5A – how much it is important to talk with some children in the classroom	3,27	,961
5B – the frequency that occurs to talk with some children in the classroom	2,27	,834
5C – how much difficulty feels when talking with some children in the classroom	3,33	,915
6A – how much it is important to hear the television with other people	3,00	1,104
6B – The frequency that occurs to have to hear the television with other people	3,33	,900
6C – how much difficulty feels to hear the television with other people	3,00	,816
7A – how much it is important to hear the television alone	3,13	,915
7B – the frequency that occurs to hear the television alone	2,67	,816
7C – how much difficulty feels to hear the television alone	3,47	,915
8A – how much it is important to listen to music	3,00	1,163
8B – the frequency that occurs to listen to music	2,67	1,060
8C – how much difficulty feels when listen to music	3,13	,915
9A - how much it is important to hear what it is said in the telephone	3,13	1,060
9B – the frequency that occurs to have to hear what is said in the telephone	2,27	1,104
9C – how much difficulty feels to hear what it is said in the telephone	3,47	,743
10A – how much it is important to hear the sound of the buzzer of an ambulance	3,13	,816
10B – the frequency that occurs to hear the sound of the buzzer of an ambulance	2,27	1,163
10C – how much difficulty feels to hear the sound of the buzzer of an ambulance	2,67	1,163

Table 6. Average of the comparative degrees between the members how much to scores of difficulty (ANOVA).

Question	C1	A1	A2	A3	p
1C – difficulty to hear the professor in a noise classroom	2,67	3,13	3,27	3,27	0,696
2C - difficulty to hear instructions of adults in external environments	3,13	3,40	3,07	3,13	0,820
3C - difficulty to hear the telephone in another one room of the house	2,80	2,67	3,13	2,87	0,845
4C - difficulty to hear the sound of vehicles if approaching	2,80	2,87	2,73	3,13	0,795
5C - difficulty when talking with some children in the classroom	3,33	3,33	2,87	2,80	0,376
6C - difficulty to hear the television with other people	3,00	3,33	2,80	2,87	0,435
7C - difficulty to hear the alone television	3,47	2,87	2,27	3,00	0,116
8C - difficulty to hear music	3,13	3,53	3,00	2,87	0,125
9C - difficulty to hear what it is said in the telephone	3,47	2,73	3,40	3,53	0,754
10C - difficulty to hear the sound of the buzzer of an ambulance	2,67	2,53	2,67	2,87	0,820

Table 7. Value p of the comparative degree enters the groups how much scores of difficulty (Tukey).

Groups	A1	A2	A3
C1	0,913	0,851	0,878
A1		0,669	0,982
A2			0,993

* level of significance of 5% (p=0,05).

Annex I.

HOSPITAL OF THE CLINICS OF THE COLLEGE OF MEDICINE OF THE UNIVERSITY OF SÃO PAULO
 TERM OF FREE AND CLARIFIED ASSENT
 (Instructions for fulfilling in the verse)

I - DATA OF IDENTIFICATION OF THE CITIZEN OF THE RESEARCH OR THE LEGAL RESPONSIBLE.

NAME OF THE PATIENT.:
 DOCUMENT OF IDENTITY: SEX: M () F ()
 BIRTHDAY:/...../.....
 ADDRESS N° APT:
 QUARTER: CITY
 CEP: TELEPHONE: DDD (.....)

2. LEGAL RESPONSIBLE
 NATURE (degree of kindred, tutor, custodian etc.)
 IDENTITY DOCUMENT: SEX: M () F ()
 BIRTHDAY:/...../.....
 ADDRESS: N° APT:
 QUARTER: CITY:
 CEP: TELEPHONE: DDD (.....)

II - DATA ON THE SCIENTIFIC RESEARCH

1. HEADING OF THE RESEARCH PROTOCOL QUALITY OF LIFE OF THE DEAF CHILD OF 7 THE 12 YEARS: THE PAPER OF THE DEVICE OF INDIVIDUAL SONOROUS AMPLIFICATION
 2. RESEARCHER: Luciana Regina de Lima Carvalho
 FUNCTION/EMPLOYEE: Studying Master of Phonoaudiology
 REGISTRATION REGIONAL ADVICE N° 15898
 UNIT of the HCFMUSP: Department of Physiotherapy, Speech Therapy and Occupational Therapy of the College of Medicine of the University of São Paulo
 3. EVALUATION OF THE RISK OF THE RESEARCH:
 WITHOUT RISK OF DANGER • MINIMUM RISK • * AVERAGE RISK •
 RISK LOW • RISK BIGGER •
 (Probability from that the individual suffers some damage as immediate or delayed consequence of the study)
 * is about an evaluation of not invasive speech therapist nature.
 4. DURATION OF the RESEARCH: 2 years

III - REGISTER OF THE EXPLANATIONS OF THE RESEARCHER TO THE PATIENT OR ITS LEGAL REPRESENTATIVE ON THE RESEARCH CONSIGNING:

Your son was invited to participate of a work whose objective is to investigate the quality of life of deaf children in the age group of 7 the 12 years of age, under the point of view of different people who coexist it and taking as base the paper of the use of the auditory device. That is, the objective of this research is to verify if the adequate use of the auditory device can increase the quality of life of the deaf child. For this, information of different people will be collected who coexist the child.

The following materials and procedures will be used: questionnaire with questions on the behavior of the child in different situations (to be answered by the proper child and the people that coexists it), comment of the manuscript of the device (carried through for the responsible child or), and examinations of hearing (audiometry and tests of speak, with and without the device). The application of the questionnaires and the comment of the manuscript of the device will be filmed. The total duration will be of approximately two hours and stocking, however, so that the participants are not very tired, the hearing examinations will not be carried through in the same day of the application of the questionnaires and comment of the manuscript of the device.

The research presents minimum risk, since it is not of invasive nature. As discomfort, the participant could be tired, since she will remain in evaluation for a period of about eighty minutes in each one of the days of evaluation. It will be able to still have a light bother due to rank of the phones in the ears for accomplishment of the hearing examinations.

The result of the evaluation will be given to each one of the participants. Children who present problems will be directed for specialized professional evaluation. It does not have restriction of participation in any other procedures of any nature.

IV - CLARIFICATIONS GIVEN FOR THE RESEARCHER ON GUARANTEES OF THE CITIZEN OF THE RESEARCH CONSIGNING:

The participant will have access to any time to the information on procedures, risks and benefits related to the research, also to nullify eventual doubts. The participant will have freedom to remove its assent at any time and to leave to participate of the study, without this brings damage to the continuity of the assistance.

The data of this research will be kept, after the ending of the same one (2009) per more 5 years (up to 2014).

The research does not present risk to provoke damages to the health, for not being invasive.

V. INFORMATION OF NAMES, ADDRESSES AND TELEPHONES OF THE RESPONSIBLE ONES FOR THE ACCOMPANIMENT OF THE RESEARCH, FOR CONTACT IN CASE OF CLINICAL INTERCORRÊNCIAS AND ADVERSE REACTIONS.

LUCIANA REGINA DE LIMA CARVALHO. OLGA BENÁRIO STREET, 53, TEL. 3989-8686 / 7242-3823

IDA LICHTIG. CIPOTÂNIA STREET, 51, TEL. 3091-8418

VII - ASSENT AFTER-CLARIFIED

I declare that, after conveniently clarified for the researcher and to have understood what was explained me, I assent in participating of the present Protocol of São Paulo
 Research, June 20th of 2007.

Signature of the citizen of the responsible research or legal signature of the researcher
 (Stamp or Legible name)

Situations related for the children as of big difficulty had been understood in item 8 (to hear music) and 9 (to hear what it is said in the telephone), both situations that involves more advanced abilities auditory (understanding of speaks without visual track). The situations of lesser difficulty had been to hear the buzzer of an ambulance and to hear the touch of the telephone in another room of the house (item 10 and 3, respectively), due to raised intensity of these sonorous signals.

The majority of the citizens presented damage in auditory abilities due to auditory loss, exactly making device use. A possible explanation for such fact is the delayed identification of the deafness of the pertaining children to the study (11). But a citizen (subject 4) received the diagnosis before the six months from life, being diagnosed to the rising (mother had rubella in the gestation). The average age of the diagnosis for the too much citizens was of 25,3 months, age very above of the recommended one for the Brazilian Committee On Auditory Losses of childhood (CBPAD). According to committee, all the children must be tested to the birth or in the maximum until the three months of age, and, in case of confirmed auditory deficiency, to receive educational intervention until the six months from life (8).

The three citizens with the worse scores of difficulty had auditory losses of deep degree, in such a way, can be said that the degree of the auditory loss intervened with the auditory abilities of the evaluated deaf children.

All the children with auditory loss of severe degree had preferred to use the verbal language to the one of signals. Already it enters the children with deep loss; only one (12.5%) preferred to use the verbal language. Such data suggest that the degree of audibility with the use of the auditory device can also intervene with the choice of the linguistic modality.

It is interesting to notice despite the only citizen with score of difficulty adjusted in the LSQ was also the only one in such a way to present satisfactory linguistic performance in the verbal language how much of signals, presenting auditory loss of severe degree and making device use in a long period.

The children of the study had been capable to answer to the LSQ in satisfactory way, a time that none of the citizens presented difficulty to answer to the questions of the questionnaire. It is treated, therefore, of an instrument adjusted for use with Brazilian deaf children above of seven years, therefore the simple language and proportionate the visual support for the figures allows the understanding of the same content for children in initial periods of training of the linguistic, independent development of its modality (verbal or language of signals). It is standed out that the

phonoaudiology must have basic slight knowledge of POUNDS to manage the questionnaire with using children of language of signals (9,10).

The results demonstrated the viability of the evaluation of the auditory abilities in using deaf children of auditory device the information of the family, a time that the difference differently between the data offered for the groups that had participated of this research were not statistical significant, of the found results in the study of APPLETON and BAMFORD (15).

Independent of the time of weekly conviviality with the child, the adults of the different groups had had similar visions on the exploitation, the difficulties and the frequency of each situation presented in the questionnaire. However, it is interesting to observe that, amongst adults who had made suggestions or commentaries in the LSQ, five they belonged to the A1 group, three were of the A2 group and only one belonged to the A3 group. This leads to the conclusion of that the adults whose copes with the child is bigger, tend to have ampler visions of their behavior, being more intent to their reactions and preferences, although the results not to have statistical been significant in this aspect. It is interesting to observe also that it had a trend of the groups C1 and A1 to present more similar answers in the LSQ, pointing out that how much bigger the conviviality with the child, greater can be equivalence between the answers.

Thinking about forms to reduce the difficulties faced for the using deaf children of auditory device, in order to improve the quality of life of these children and their families, an available resource is the use of systems of frequency modulated (FM) in environments where it has sonorous competition (classrooms, for example), use that, unhappily, still little is spread in Brazil due to the raised financial cost (2).

Future studies become necessary to also validate the use of the LSQ in children listeners, a time that the questionnaire is capable to supply important information concerning the auditory behavior of this population by means of situations of sonorous competition, being able to be an instrument of great utility for the evaluation of children with problems of auditory processing. Using children of implantation to also cochlear can benefit themselves of such use.

CONCLUSION

The results supplied for the studied groups indicate damage in the auditory abilities of the children evaluated had to the difficulties faced for them to listen to elements gifts in situations of the daily one. Such damage, however, suffers sensible reduction with the use from the auditory device, a time that the majority of the children benefited

of the amplification supplied for the device, getting props up totals adjusted in the LSQ.

The device of individual sonorous amplification exerted influence in the auditory abilities of the evaluated children and the adults which they coexist, although the proportionate benefit for their use to be lesser of what the waited one.

The viability of the administration of the LSQ with deaf children above of seven years using of auditory device and with the adults was evidenced clinically whose coexistence with these children is superior the ten weekly hours, indicating the effectiveness of this instrument for evaluation of such population. It is standed out, however, that the LSQ does not have to be the only instrument of evaluation of the auditory abilities of this population, but a complement to the structuralized procedures.

More studies are necessary to corroborate the data found in this research and to clarify the differences between the available data in international literature and the results gotten in the present study.

BIBLIOGRAPHIC REFERENCES

1. Casquitini EAT, Bevilacqua MC. Escala de Integração Auditiva Significativa: Procedimento adaptado para a avaliação da percepção da fala. *Rev Soc Bras Fonoaudiol*. 2000, 4(6):51-60.
2. Moeller MP, Hoover B, Peterson B, Stelmachowicz P. Consistency of hearing aid use in infants with early-identified hearing loss. *Am J Audiol*. 2009, 18(1): 14-23.
3. Coninx F, Weichbold V, Tsiakpini L, Autrique E, Bescon G, Tamas L et al. Validation of the LittEARS® Auditory Questionnaire in children with normal hearing. *Int J Pediatr Otorhi*. 2009, 73:1761-1768.
4. Robbins AM, Renshaw JJ, Berry SW. Evaluating meaningful auditory integration in profoundly hearing impaired children. *Am J Otol*. 1991, 12(suppl):144-150.
5. Zimmerman-Phillips S, Osberger MJ, Robbins AM. Infant-Toddler: Meaningful Auditory Integration Scale (IT-MAIS). Sylmar, Advanced Bionics Corporation, 1997.
6. Casquitini EAT. Escala de integração auditiva significativa: procedimento adaptado para a avaliação da percepção da fala. São Paulo, 1998 (Dissertação de Mestrado – Pontifícia Universidade Católica).
7. Boscolo CC, Costa MPR, Domingos CMP, Perez FC. *Rev Bras Ed Esp*. 2006, 12(2):255-268.
8. Comitê Brasileiro sobre Perdas Auditivas da Infância (CBPAI). Recomendação 01/99 do Comitê Brasileiro Sobre Perdas Auditivas da Infância. *Jornal do CFFa*. 2000, 5: 3-7.
9. Schemberg S. Educação escolar e letramento de surdos: reflexões a partir da visão dos pais e professores. Curitiba, 2008 (Dissertação de Mestrado – Faculdade de Ciências Biológicas da Saúde da Universidade Tuiuti do Paraná).
10. Guarinello AC, Berberian AP, Santana APO, Bortolozzi KB, Schemberg S, Figueiredo LC. Surdez e letramento: pesquisa com surdos universitários de Curitiba e Florianópolis. *Rev Bras Ed Esp*. 2009, 15(1):99-120.
11. Korver AMH, Konings S, Dekker F, Beers M, Wever CC, Frijns JHM et al. Newborn Hearing Screening vs Later Hearing Screening and Developmental Outcomes in Children With Permanent Childhood Hearing Impairment. *JAMA-J Am Med Assoc*. 2010, 304(15):1701-1708.
12. Carvalho LS, Cavalheiro LG. Detecção precoce e intervenção em crianças surdas congênicas inseridas em escolas especiais da cidade de Salvador / BA. *Arq Int Otorrinolaringol*. 2009, 13(2): 189-194.
13. Abrams HB, Chisolm TH, McCardle R. Health-related quality of life and hearing aids: A tutorial. *Trends Amplif*. 2005, 9(3):99-109.
14. Institute of Hearing Research. Listening Situations Questionnaire. University of Manchester 2000.
15. Appleton JA, Bamford J. Parental and child perception of hearing aid benefit. *Deafness Educ Int*. 2006, 8(1):3-10.
16. Nikolopoulos TP, Vlastarakos PV. Treating options for deaf children. *Early Hum Dev*. 2010, 86(11):669-674.
17. Institute of Hearing Research. Listening Situations Questionnaire (Parent version). University of Manchester 2004.
18. Scientific Advisory Committee of Medical Outcomes Trust. Assessing health status and quality of life instruments: attributes and review criteria. *Qual Life Res*. 200, 11:193-205.
19. Carvalho LRL. Qualidade de vida da criança surda de 7 a 11 anos: O papel do aparelho de amplificação sonora individual. São Paulo, 2010 (Dissertação de Mestrado – Faculdade de Medicina da Universidade de São Paulo).
20. Fitzpatrick E, Graham ID, Durieux-Smith A, Angus D, Coyle D. Parents' perspectives on the impact of the early diagnosis of childhood hearing loss. *Int J Audiol*. 2007, 46(2):97-106.