SPEECH AND LANGUAGE DEVELOPMENT IN HEARING IMPAIRMENT: TWO- CASE REPORT

Desenvolvimento de fala e linguagem na deficiência auditiva: relato de dois casos

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ABSTRACT

This study aims at monitoring the development of speech and language of two children who have hearing loss – one of which is a user of bilateral auditory prosthesis and the other has unilateral cochlear implant and auditory prosthesis. Assessment List of Expressive Vocabulary protocols and Symbolic Maturity were used in both cases, and the children were cared for in the educational audiology outpatient clinic the Federal University of Sao Paulo through aurioral approach. Both were submitted to the application of Symbolic Maturity, having the following recordings: free play, semi-guided play, and action imitation; videos were transcribed and analyzed. Assessment List of Expressive Vocabulary was applied to parents in order to investigate the words which the children were able to pronounce; the number of words was counted and analyzed in conjunction with the results of Symbolic Maturity. Both tests were applied on both children in two moments within an interval of five months. Both had a development in all the tests of the Symbolic Maturity and on Assessment List of Expressive Vocabulary when the two applications were compared. On the first application of Assessment List of Expressive Vocabulary was applied, the girl could say three words (0,9%) and the boy 90 words (29,4%); on the second application, 25 words (8,1%) and 176 words (57,5%) respectively. The boy presented a better development on the tests of Symbolic Maturity and Assessment List of Expressive Vocabulary when compared to the girl. Protocols applied in two different moments of the children's developments were efficient in monitoring the development of speech and language. The better development achieved by the male child could be associated to the degree of auditory loss.

KEYWORDS: Language; Hearing Loss; Deafness; Child; Speech; Hearing

INTRODUCTION

First years of life are critical for the development of auditory and language abilities. This period that is the peak of the process of maturation of the central auditory system and neural plasticity occurs in the auditory pathway. Patients with hearing loss require that the diagnosis be made early so that a reduced impact on language development, auditory and cognitive abilities occurs. Thus, the interval between the suspected hearing loss, diagnosis and intervention should be minimized[1-3].

Hearing impairment is a factor that directly compromises the individual's language. This can vary according to the type and degree of hearing loss. It is known that sensorineural hearing loss is severe to profound that can cause more damage languages, making the acquisition and development of oral language, especially in people with pre-lingual hearing loss. Language acquisition is a process dependent on the integrity of the auditory system and when it is damaged by a hearing loss. It is important to speech therapy intervention, along with the use of sound amplification devices, so that the child may have a chance to develop speech, consequently learning and expanding your knowledge of the world.

Educational Audiology is the area of speech therapy that treats the relationship hearing and

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language. A therapeutic approach is the aurioral. In this context are created therapeutic strategies for the acquisition and development of oral language are stimulated by residual hearing in order to avoid the limitations of comprehension and verbal expression, providing opportunities to hear the individual as its development, expansion of their knowledge, life experiences, becoming active in society using visual and auditory integration[4]. For this type of therapy to be successful, the use of hearing aids and / or cochlear implants is essential.

Studies say that hearing aids allows the hearing-impaired children greater access to acoustic information from the sounds of language, which creates more chances for oral language development[5]. This technology is suitable for various types and degrees of hearing losses. However, cases that the hearing aid is unable to adequately provides these acoustic information by excessive low residual hearing, cochlear implant (CI) may provide better results in rehabilitation[6].

The cochlear implant is currently the most effective technological resource to facilitate access for the deaf person sound world[7]. Until then no electronic device would have allowed the individual who acquired severe / profound deafness before the acquisition of language, the ability to understand and express it with functionality and abstraction.

For the combination of speech therapy and sound amplification device to be effective it is necessary to monitor the oral language of the individual to verify quantitatively and qualitatively the evolution of hearing impaired children. There are protocols that aim to evaluate the performance of expressive vocabulary and the symbolic maturity of the child, such as LAVE – Assessment List of Expressive Vocabulary Test, an adaptation to Portuguese of LDS – Development Language Survey, which investigates and detects expressive language delays in oral. Proof of Symbolic Maturity investigates the relationship between the development of language, gestures and symbolic play through the interactions with the child.

Language development is essential to the child's entry into the symbolic world, so that she can reach levels of greater complexity in language. The symbolic function is the ability to represent the lived world and is composed of language, symbolic play, imitation, problem solving by combination of actions and mental imagery[8].

User surveys of hearing aid devices are necessary today since in the past the technology used was more restricted not being able to enable hearing levels as close to normal as today, especially with the use of cochlear implants. Moreover, the speech-language therapy intervention gained more space, since the results obtained by joining the technological resources to therapeutic approaches have been increasingly satisfactory. For the efficacy of this combination is proven, it is very important to use standardized assessment protocols to quantify the improvement of the subjects, to show parents how to use the devices and attendance to therapy is important and makes all the difference in the development of hearing impaired children.

The purpose of these case reports is to characterize and compare the development of speech and language in two deaf children with similar ages, being a user of bilateral hearing aids and other cochlear implant and hearing aid using the protocols, LAVE[9] and Symbolic Maturity[10], which was applied at two different times.

CASE REPORTS

Research approved by the Ethics Committee of UNIFESP as Embodied Opinion No. 192.036 of 21/12/2012.

The children's parents signed a consent form to allow the participation of children in research.

Participated in this study, two individuals, one male and one female, with 3 and 4 years old, respectively, in the Outpatient educational audiology speech therapy course at the Federal University of São Paulo – UNIFESP on visits made twice a week with 45-minute sessions in aurioral approach. The goal of therapeutic procedures performed was to develop auditory skills, acquire and develop oral communication and cognitive aspects, in addition to providing guidance to the family and school.

Case 1- Male, date of birth 27/05/2009 (3 years old), sensorineural, moderate hearing loss in the left ear and profound in the right ear; preterm (7 months), addict mother. Transient evoked otoacoustic emissions (TEOAE) performed in March 2011 with absent responses bilaterally. Evoked Auditory Brainstem Response (ABR) conducted in April 2011, results of the left ear showed waves I, III and V with preserved morphology, absolute latencies and interlatencies within the benchmarks. Wave V cannot be observed in the intensity of 50 decibels (dB) with latency abruptly shifted (cochlear component). The results of the right ear showed absence of electrophysiological responses to 90 dB. 1 year and 11 months old, was diagnosed with Sensorineural Hearing Loss moderate degree of left ear and profound of right ear. It was adapted bilaterally with BTE hearing aids in December 2011, 2 years and 7 months of age (Table 1 – Functional Gain Case 2) and started speech therapy in January 2012 at the clinic of educational audiology at UNIFESP.

Table 1 – Functional Gain Case 1

Frequency (Hz)	250	500	1000	2000	4000
Intensity (dB)	15	20	35	35	50

Case 2 – Female, date of birth 18/06/2008 (4 years old), bilateral profound sensorineural hearing loss; preterm (8 months). 1 year and 6 months of age, and held the ABR was diagnosed. In August 2011, at 3 years and 2 months old, received a donation of a pair of BTE hearing aids and after use, the child began to become more attentive to the sounds, but the mother observed behavior with the best hearing device in right ear. In September 2011 started speech therapy at the clinic of educational audiology at UNIFESP. In October 2011, underwent surgery cochlear implant in the left ear, which was activated in December 2011, at 3 years and 5 months old. Currently uses cochlear implant in his left ear and a hearing aid in the right ear (Table 2 – Gain Functional Case 2).

Table 2 – Functional Gain Case 2

Frequency (Hz)	250	500	1000	2000	4000
Intensity (dB)	45	30	30	25	55

Children were assessed using two protocols: Maturity Assessment Symbolic and LDS applied in two stages, with an interval of five months between one and another application. Parents answered LAVE and Symbolic Maturity videotaped for later analysis. In addition, the researcher conducted weekly monitoring of the therapeutic process of the two children.

Maturity Assessment Symbolic (Figure1)

The test was applied in two steps in the same session:

- **First step:**

A. Free play that the therapist offers the child the object of the protocol in a box and tells her to play as you wish. The therapist stands next to the patient, responsive to his initiatives, but does not interfere nor suggests any activity (Duration 20 minutes).

B. Play semi-guided that the therapist use the same earlier object. The therapist interacts with the child, in moments of shared attention, suggesting activities, but providing a time for the child to have their own initiatives (Duration 20 minutes).

- **Second step**: Play directed that the therapist performs imitation activity with the child. The therapist performs an action with certain objects and then give the child to do the same, calling attention only to the object, without naming the action. Each scheme was presented only once, repeated only when the child was losing attention during the presentation.

Box Objects: Toy telephone, a large ball, dolls and animals textiles and plastics, small vehicles, kitchen utensils, baby bottle, a blanket and a small pillow, a long necklace, glasses and serial blocks, abacus and two mechanical windup toys (Figure 2).

Objects for imitation: Cup, toothbrush, spoon, doll, soap, flower, frog, airplane, hat, car, banana, cot, bath, bib, blanket, book and towel (Figure 3).

All sessions were recorded, transcribed and analyzed to obtain the test results.

Videos of the first and second application of the Test Maturity Symbolic of each subject were analyzed in order to compare the child with herself and check your progress and then comparing the two children was performed. Each type of schema or symbolic game receives a score that was added to each activity performed by the child, as noted in the items below (Schemes evaluated in free play situation):

- Presymbolic scheme (PS) 1 point;
- Self-symbolic scheme (SS) 2 points;
- Symbolic assimilative play (SAP) 3 points;
- Symbolic imitative play (SIP) 4 points;
- Symbolic object play replaced (SOPR) 5 points;
- Simple combinatorial symbolic play (SCSP) 6 points;
- Combinatorial symbolic play multiple (CSPM) 7 points.

Every action taken by the child in a situation addressed / imitation of gesture schemes, a point was added, totaling the values below:

- Gestural imitation of simple schemes (up 9 points);
- Imitation of sequential gestural schemes in familiar routines (up 12 points).

Assessment List of Expressive Vocabulary – LAVE (Capovilla, 1997) (Figure 4)

The questionnaire LAVE takes into filling in personal data relating to the history of the child and his family: registration data, education, employment and income of the parents, number of children, past medical history, chronic diseases, childbirth, perinatal complications, prematurity, ear infections if the child is cared for by nanny, concurrent or previous speech therapy and / or psychological treatment, schooling, maximum number of words in a sentence issued, another type of classroom beyond the school, including sports, level of parental concern with child's language, words and best built and long sentences that the child has already spoken to the date of application.

After completing the brief history of the child, the guardian should select on a board, the words that the child issues, even those that do not say clearly. On board, the words are divided into 14 categories: food, toys, environment, animals, body parts, places, actions, house, objects, people, clothes, vehicles, modifiers, and others. Words the child can understand are not allowed, but emits nor did repetitions and imitations that are not characterize as spontaneous speech.

LAVE Protocol was examined by the number of words that the child produced in the first application as compared to that produced in the second application. After this individual comparison, there was a comparison between the performances of two children.

ASSESSMENT OF SYMBOLIC MATURITY – Research Part
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I) Situation of Free Play and Semi-guided Play

No	Descriptions of Episodic Units	EPS	EAS	JSA	JSI	JSOS	JSCS	JSCM	Other

More elaborate play presented by child: _____
Play more used by the child: _____
Total: _____

II) Guided Situation/ Imitation of Gesture Schemes
1) Imitation of simple gestures schemes
Practical test: ( ) Yes ( ) No

Gesture	Appropriate	Inappropriate	Description of the Child Action
Drink			
Brushing Teeth			
Put on the Head			
Push			
Eat			
Hug			
Washing Hands			
Smell			
SCORE			

2) Imitation of sequential gestural schemes in family routines:
Practical test: ( ) Yes ( ) No

Gesture	Total No. of schemes	Different schemes	Description of the Child Action
Feed the Baby			
Putting Baby on Bed			
Give Baby a Bath			
TOTAL SCORE			
Mean			

Figure 1 – Protocol of symbolic maturity

Figure 2 – Box Objects

Figure 3 – Objects for imitation

Assessment Listo f Expressive Vocabulary – LAVE
(Translation and adaptation by Capovilla, 1997 LDS – Rescorla, 1989)
Authorization to research for Prof. Dra. Márcia Regina Marcondes Pedromônico

Please complete the form below to allow us access to important information about the child.

Date: __/__/___ Your Name: _____ Relationship with the child: _____
Name of the Child: _____ Birth Date: __/__/__ Sex: _____

	Mother	Father
Name		
Address		
Telephone		
Birth Date		
Civil Status		
Schooling		
Employment	Unemployed ( )	Unemployed ( )
	Part-time Employment ( )	Part-time Employment ( )
	Full-time Employment ( )	Full-time Employment ( )
Occupation		

Family Income: R$ _____

Please write the sex and age of other children in the family: _____
There is someone in your family was late in learning to talk: _____ If yes, who? _____

Morbid history: chronic diseases of children: _____ birth weight:_____ Type of delivery: _____ Perinatal complications: ( ) yes ( ) no. What? _____ High hospital in ____ days. Did your child is premature? _____ If yes, how many weeks? _____ How many ear infections your child ever had? _____ Other infections or seizures? Which? _____

Your child is cared for by a nanny?_____how many hours per week?_____
your child has been to a speech therapist? _____ What is the reason? _____
your child has been to a psychologist? _____ What is the reason? _____

Your child is __ years old and ___ months old. She already has ___ months of enrollment (not including holiday periods and to form sentences with: ( ) one word ( ) two words ( ) three words ( ) four words ( ) six words ( ) seven or more words.

Besides school lessons your child has any other kind? ( ) Swimming ( ) ballet ( ) Music ( ) language ( ) day care ( )
other _____
Are you worried about the development of your child language? ___If yes, in what way?_____

PLEASE NOW COMPLETE THE VOCABULARY LIST ON NEXT PAGE.
After answering the list, answer the questions below:

Please write a few other words that your child uses here:_____
Your child combines two or more words in sentences? (eg, more cake, baby is crying) ( ) Yes ( ) No
Please write down three of the longest and most well-constructed sentences that your child has spoken: _____
_____

Please list make a risk on every word that your child speaks. You can add words that the child does not clearly pronounced. Do not include words that your child can understand, but not speak. It also does not include words that your child repeat after you, by imitation, but does not speak spontaneously.

FOOD	sidewalk	foot	go	sofa	diaper	black
water	home	chest	dinner	phone	jacket	that
candy	rain	leg	play	bowl	socks	broken
banana	star	neck	wash	towel	pajamas	hot
drink	flower	chin	read	pillow	shoe	dirty
biscuit	moon	face	show off	TV	shorts	red
cracker	snow	**PLACES**	look	cup	tennis	**OTHER**
muffin	street	canteen	stop	**OBJECTS**	dress	(profanity)
cake	sun	school	walk	notebook	**VEHICLE**	A, B, C, etc.
hot dog	**ANIMALS**	hospital	pick up	pen	plane	here
coffee	bee	church	skip	key	boat	au au
meat	dog	shop	want	money	bicycle	you're welcome
tea	horse	Mc Donald's	Sign out	brush	truck	good night
bubble gum	snake	park	sit	toothbrush	path	with you
food	rabbit	room	have	umbrella	car	excuse me
sweet	elephant	zoo	take	pencil	motorcycle	off
burger	puppy	**SHARES**	cough	scarf	bus	up
orange	chicken	hug	bring	backpack	skates	under
milk	cat	run out	to see	currency	train	out
apple	monkey	hit	come over	glasses	**MODIFY**	far away
macaroni	mosquito	help	piss	paper	open	tasty
butter	bird	lunch	**HOME**	comb	it's over	over there
egg	duck	love	cradle	**PEOPLE**	yellow	connected
bread	fish	floor	chair	(pet)	blue	myself
pizza	turkey	arrange	bed	Name / nickname own	low	meow
cheese	pig	bath	ground	baby	good	me
soda	frog	beat	shower	man	beautiful	do not
soup	tortoise	applaud	blanket	mom or mother	white	which
ice cream	tiger	drinking coffee	spoon	doctor	tired	thank you
juice	bear	kiss	cup	girl	certain	hi
cornflakes	cow	sing	ladder	boy	creed	where
toast	**BODY PARTS**	kick in	mirror	woman	up	please
grape	belly	tickle	phaco	father or dad	dark	quiet
TOYS	mouth	poo	fork	aunt	closed	yes
balance	cheek	eat	bottle	uncle	stinky	bye
balloon	arm	get	window	grandmother or grandma	happy	you
ball	butt	run	garbage	grandfather or grandpa	hunger	xuxa
ball of soap	hair	cut off	light	**CLOTHING**	cold	1, 2, 3, etc.
doll	elbow	dance	table	blouses	large	
slide	thumb	give	sink	boots	that	
colored pencil	finger	rest	door	pants	clean	
Lego	teeth	sleep	plate	shirt	more	
book	knee	push	toilet seat	T-shirt	bad	
present	hand	hide and seek	radio	hat	my	
Teddy bear	nose	do	clock	slipper	wet	
ENVIRONMENT	eye	close	soap	belt	small	
tree	ear		room	underwear / panties	heavy	

Figure 4 – Assessment List of expressive vocabulary – LAVE

RESULTS

The study compared the development of two children with hearing loss, speech and language stimulation after language, evaluating the score of the level of symbolic play and oral language in two different periods.

Both children demonstrated improvement in all tests of symbolic maturity, except the child in case 1 in the second application of semi-guided play. We observe better performance on proof of free play in the child in case 1 and in simple imitation in child in case 2. (Table 3 and 4).

In LAVE observed an increase in the number of words produced by the two subjects in the second application. However, we observed better performance of the child in case 2 to the oral expression. (Table 5)

Table 3 – Results symbolic maturity case 1

Task	Application I	Application II
Free Play	23	52
Semi-guided Play	43	28
Simple Imitation	6 (66.6%)	8 (88.8%)
Sequential Imitation	9 (75%)	12 (100%)

Table 4 – Results symbolic maturity case 2

Task	Application I	Application II
Free Play	11	22
Semi-guided Play	13	25
Simple Imitation	0	8 (88.8%)
Sequential Imitation	11 (91.6%)	11 (91.6%)

Table 5 – Results LAVE case 1 and case 2

	Task	Application I	Application II
Case 1	LAVE	90 (29.4%)	176 (57.5%)
Case 2	LAVE	3 (0.9%)	25 (8.1%)

DISCUSSION

Through language protocols applied at different times in the two cases, it was possible to characterize and compare the development of speech and two deaf children with similar language ages, being a user of bilateral hearing aids and other cochlear implant and hearing aid.

The two participants in this study demonstrated improvement on tests of symbolic maturity. However, the child of Case 1 had a lower score in the second application of semi-guided play compared with the first application. Nevertheless, the reduction in the score can be explained by the fact that children have entertained longer in the same activity and the fact you have used more oral communication in the second application compared to the first.

The use of oral communication decreases the gestural and symbolic aspects of children, since for them this step has already been accomplished and it became easier to say what you want through speech. In this study, the therapy is essential regardless of the technology used in each case. It is important to note that the technology was able to increase the level of audibility of each subject, but the main factor contributing to the improvement of expressive language was that aurioral therapy was effective, along with guidance for family.

In evidence of free and semi-guided plays of Symbolic Maturity, both participants showed the first pre-application schemes more symbolic and less complex plays and the second application, the opposite occurred, were made less "pre-symbolic schemes" (PS) and more complex plays as: Symbolic imitative play (SIP); Symbolic object play replaced (SOPR); Simple combinatorial symbolic play (SCSP); Combinatorial symbolic play multiple (CSPM).

It was observed that deaf children exhibit symbolic play less complex when compared to children with normal hearing[8], ie, more presymbolic scheme (PS) and assimilative symbolic play (SAP). There is consensus that child with pre-lingual hearing loss presents the greatest risk for language delay, which differs from the development of that child to a child with normal hearing. This delay imposes limitations that may delay primitive aspects of development, as the first signs of symbolic play prior to the use of oral language. The presence of less complex play was also observed in this study in the first application, but with therapy, along with the efficiency of sound amplification devices, observed evolution in the type of play performed in all tests of symbolic maturity.

The results showed that the evolution of the study participants occurred at the level of vocabulary (expressive language), as in play (symbolic play). This finding corroborates another study, in which the author stated that the lack of language, very common in the hearing-impaired child, makes the same has underperformed in symbolic play that way if there is improvement in the child's speech, therefore it will also provide superior performance in symbolic play, as seen in the cases presented[11].

Child Case 1 showed greater evidence for evolution of symbolic maturity and LAVE, when compared to child of Case 2. Such differences may over time of sensory deprivation, which was lower in Case 1, which was fitted 10 months before (at 2 years and 7 months) than case 2, which activated the IC only at 3 years and 5 months old. As reported in other studies, the later the child is aided or implanted, the greater its limitations both in relation to its development as auditory cognitive, social and personal[12]. Another factor in improving the performance of case 1 is the degree of hearing loss that is moderate in the left ear and profound in the right ear. Thus, it is favorable access to auditory cues with the use of hearing aids.

The sensorineural hearing loss of severe or profound, it submitted the participant of this study (Case 2), is the degree that causes more damage in the acquisition and development of oral language[7]. This may have influenced that evolution has been lower compared to the other participant.

Despite child of Case 2 be older than the child of Case 1, it has a profound bilateral hearing loss, which causes her to have a slower development. In addition, the child of Case 2 has a more introspective behavior when compared to children of Case 1. Child of case 2 demonstrated that she had always wanted to get into something; she did not, by shyness or not understood whether she had allowed playing.

CONCLUSION/FINAL CONSIDERATIONS

The protocols applied in two different moments in the development of children have been effective to monitor the development of speech and language, as demonstrated better performance in functions evaluated over time. The best child performance of Case 1 may be associated with moderate degree of hearing loss on the left ear and the shorter sensory deprivation.

RESUMO

O objetivo é monitorar o desenvolvimento de fala e linguagem de duas crianças deficientes auditivas, utilizando os protocolos da Lista de Avaliação de Vocabulário Expressivo e Maturidade Simbólica, sendo uma criança do sexo masculino, três anos de idade, perda auditiva neurossensorial moderada na orelha esquerda e profunda na orelha direita, usuária de prótese auditiva bilateral e a outra do sexo feminino, quatro anos de idade, perda auditiva neurossensorial profunda bilateral, com implante coclear unilateral e prótese auditiva, ambas atendidas no ambulatório de audiologia educacional da Universidade Federal de São Paulo, na abordagem aurioral. Os sujeitos foram submetidos à aplicação da Maturidade Simbólica (brincadeira livre, brincadeira semi-dirigida e imitação de ações) e Lista de Avaliação de Vocabulário Expressivo para investigação do jogo simbólico e da linguagem expressiva, respectivamente. Os testes foram aplicados nas duas crianças em dois momentos, num intervalo de cinco meses. Ambas tiveram evolução em todas as provas da Maturidade Simbólica e na Lista de Avaliação de Vocabulário Expressivo quando comparadas as duas aplicações**.** Na primeira aplicação da Lista de Avaliação de Vocabulário Expressivo, a criança do sexo feminino emitia três palavras (0,9%) e a do sexo masculino 90 palavras (29,4%); na segunda aplicação 25 palavras (8,1%) e 176 palavras (57,5%) respectivamente. O menino apresentou melhor evolução nas provas de Maturidade Simbólica e Lista de Avaliação de Vocabulário Expressivo, quando comparada a menina. Os protocolos aplicados em dois momentos diferentes do desenvolvimento das crianças foram eficazes para monitorar o desenvolvimento de fala e linguagem. O melhor desempenho da criança do sexo masculino pode estar associado ao grau de perda auditiva.

DESCRITORES: Linguagem; Perda Auditiva; Surdez; Criança; Fala; Audição

REFERENCES

1. Pinto MM, Raimundo JC, Samelli AG, Carvalho ACM, Matas CG, Ferrari GMS et al. Idade no diagnóstico e no início da intervenção de crianças deficientes auditivas em um serviço público de saúde auditiva brasileiro. Arq. Int. Otorrinolaringol. / Intl. Arch. Otorhinolaryngol.2012;16(1):44-9.
2. Theunissen M, Swanepoel DW. Early hearing detection and intervention services in the public health sector in South Africa. Int J Audiol. 2008;47(1):23-9.
3. Nóbrega M, Weckx LLM, Juliano Y, Novo NF. Aspectos diagnósticos e etiológicos da deficiência auditiva em crianças e adolescentes. Rev Paul Pediatr. 1998;16(1):28-43.
4. Bevilacqua MC, Formigoni GMP. Audiologia Educacional: uma opção terapêutica para a criança deficiente auditiva. Carapicuíba: Pró-fono, 2000.
5. Zanichelli L, Gil D. Porcentagem de Consoantes Corretas (PCC) em crianças com e sem deficiência auditiva. J Soc Bras Fonoaudiol. 2011;23(2):107-13.
6. Mildner V, Sindija B, Zrinski KV. Speech perception of children with cochlear implants and children with traditional hearing aids. Clin Linguist Phon. 2006;20:219-29.
7. Fortunato CAU, Bevilacqua MC, Costa MPR. Análise comparativa da linguagem oral de crianças ouvintes e surdas usuárias de Implante Coclear. Rev CEFAC. 2009;11(4):662-72.
8. Quintas TA, Curti LM, Goulart BNG, Chiari BM. Caracterizaçao do jogo simbólico em deficiente auditivo: estudo de casos e controles. Pró-fono R Atual Cient. 2009;21(4):383-8.
9. Capovilla FC, Capovilla AGS. Desenvolvimento linguístico na criança dos dois aos seis anos: tradução e estandardização do Peabody Picture Vocabulary Test de Dunn & Dunn, e da Language Development Survey de Rescorla. Ciência Cognitiva: teoria, pesquisa e aplicação. 1997;1(1):353-80.
10. Befi-Lopes DM Takiuchi N & Araujo K. Avaliação da maturidade simbólica nas alterações do desenvolvimento da linguagem. J Bras Fonoaudiol. 2000;1(3):6-15.
11. Goldfeld M. A criança surda: linguagem e cognição numa perspectiva sócio-interacionista. 2a edição. São Paulo: Plexus; 1997.
12. Lanzetta BP, Frota S, Goldfeld M. Acompanhamento da adaptação de próteses auditivas em crianças surdas. Rev CEFAC. 2010;12(3):360-70.

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