COMMUNICATIVE EVOLUTION IN TWINS WITH LANGUAGE DELAY

Evolução comunicativa em gemelares com atraso no desenvolvimento da linguagem

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ABSTRACT

The theme of this study is the communicative behavior of twins with language disorders before and after speech therapy. Data from two pairs of male twins with a diagnosis of language delay were analyzed (monozygotic – S1/S2, dizygotic – S3/S4). Data were collected in assessments made pre and post speech-language audiology intervention through: semi-structured interviews with the parents, observation of communicative behavior, and language and development scale test. The speech-language audiology intervention lasted for 34 months for S1/S2 (from two years and five months to five years and three months) and 17 months for S3/S4 (from three years and seven months to five years and four months). More severe pre, peri and post natal complications with a greater psychomotor and communicative impairment were observed in the pre speech-language audiology intervention assessment. S3/S4 showed less severe pre, peri and post natal complications and development delay occurring only in language. The age of the children in post intervention assessment was similar, however, the pair S1/S2 showed a more damaged global and communicative development, even having received a longer speech-language audiology intervention. S3 showed a performance approximate to the typical development and S4 had difficulties just concerning phonology and pragmatics. The experiences of twins, differentiated as to interpersonal circumstances, lead to atypical language development, due to the reduced objective need of linguistic interaction. The post natal complications in S1/S2 exacerbated the delay in child development, encompassing the communicative development.

KEYWORDS: Child Language; Language Development; Twins; Speech, Language and Hearing Sciences

INTRODUCTION

Language disorders are often described in multiples, as well as delays in motor and cognitive development, behavioral problems and difficulty in the children-parents interaction[1-4]. High rates of language difficulty in twins are due to the occurrence of the same risk factors for difficulties in the communicative development present in non twins (prematurity, low weight, among others) and also to social factors such as less individualized interaction[5,6]. Due to these risk factors, twin children more often receive a specialized professional monitoring, which can provide an easier acknowledgement of the communication problem[5].

Study involving twins[7] verified that language development is mainly influenced by the environment in the early years and that by the middle of the childhood and beginning of adolescence the genetic factors exert predominant roles.

The phonological system in twin children may show similarities and the setting and maintenance

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of phonological disorders may suffer genetic influences, although it is not possible to discharge the environmental factors[8].

The speech-language pathologist can contribute to the guidance and support of the twin children families as to the development, aiming at promoting the twin children health and preventing possible development disorders[9]. Thus, these children speech-language pathology monitoring and the research on cognitive language[6] development become important.

The child linguistic performance in the beginning of the speech therapy may be a predictor of her future linguistic abilities[10], and the early acknowledgment and monitoring of children with a risk for disorders in the language development offer a possibility to block the development of the pathology[11].

Having exposed that, the purposes of this study were to describe the communicative behavior before and after speech-language audiology intervention in two pairs of twins and to relate the findings with pre, peri and post natal factors.

CLINICAL CASES PRESENTATION

This study was approved by the Research Ethics Committee of its home institution (Protocol 013/2012). The free and informed consent terms were signed at the time of the children language assessment.

This is a retrospective study carried out by means of the analysis of medical charts data of twins who attended the Children Language Clinic at that institution.

In order to carry out the study, data regarding before and after speech-language audiology intervention of two pairs of male twins (S1/S2, S3/S4) diagnosed with Language Delay were analyzed.

S1/S2 were two years and five months old and S3/S4 were three years and five months old in the pre speech-language audiology intervention assessment. The post speech-language audiology intervention assessment was carried out after an intervention period of 34 months for S1/S2 (five years and three months old) and after 17 months for S3/S4 (five years and four months old). The decision to carry out the post intervention assessment at this age was due to the fact that in this is the age children with a typical language development are expected to be able to show good speech intelligibility as well as narrate facts and stories experienced[12].

For the analysis of the pre and post speech-language audiology intervention assessment, we considered the information regarding the clinical history, the baseline assessments (carried out to guide the intervention planning and to serve as clinical evolution comparison and routinely used as an assessment protocol in the clinic where these children attended speech therapy) and the child development monitoring, including the following instruments:

Observation of communicative behavior: assessment of communicative abilities and functions[12];

Gesell and Amatruda Behavior Developmental Scale[13]: assessment of the motor, adaptive, linguistic, personal and social development;

ABFW Infantile Language Test – part A (phonology) [14]: assessment of the acquisition and development of the phonologic system.

The speech-language audiology intervention was carried out to stimulate all the aspects of language (pragmatics, phonology, morph syntax and semantics). Each therapy session lasted 50 minutes and happened twice a week, individually. The Modified Cycles Model was used for the study focusing specifically on the development of the phonologic system[15].

After the post speech-language audiology intervention assessment, the four children continued attending speech therapy twice a week, in the same institution, in order to continue the intervention on the linguistic aspects which were still showing disorders.

RESULTS

Figure 1 presents data obtained with interview carried out with parents in order to raise clinical history.

The results of the pre speech-language audiology intervention assessment are in Figure 2 and 3.

Clinic History	S1/S2	S3/S4
Twinning	Monozygotic triplets; death of a 2 day old child	Dizygotic twins.
Gestational age at childbirth	27 weeks.	32 weeks.
Weight at birth	S1; 950g; S2: 1030g.	S3: 1795g ; S4: 1925g.
Complications at birth	Blood transfusion; respiratory insufficiency (neonatal ICU for 30 days) for both children.	1 week in incubator; difficulty in sucking breast milk of both children.
Health in the first infancy	3 months (S1 e S2): diagnosis of cardiac murmur; hydrocephaly (S2) Episodes of pneumonia and chronic otitis recurrent in both children.	Treatment for gastro esophageal reflux until the eighth month in both children. Episodes of upper airway infection in both children.
Neuropsychomotor development	Cervical balance: 9 months in both children. Initiation of gait: S1- 1 year and 8 months; S2 – 2 years. First words: 1 year and 10 months old in both children.	Cervical balance: S3 – 2 months; S4 – 3 months. Initiation of gait: 1 year and 2 months in both children. First words: after 2 years in both children.

Figure 1 - Data regarding clinic history

Pre intervention assessment	S1	S2	S3/S4
Age	2 years and 5 months		3 years and 7 months
Observation of the Communicative Behavior	Infrequent communicative intention. Jargon and indicative gestures. Absence of verbal shift start. Communicative function: instrumental and protest. Understanding of simple orders related to immediate context.	Infrequent communicative intention. Jargon and indicative gestures without intention of communicating. Absence of verbal shift start. Communicative function: instrumental and protest. Impaired understanding of simple orders related to immediate context.	• Use of oral language related to indicative gestures. • Echolalia, jargon, isolated words with phonologic processes. • Verbal shift start, but they did not keep the conversation topic. • Interactive, naming, protest and heuristic communicative function. • Understanding of simple orders related to immediate context. • S3: better expressive vocabulary.

Figure 2 - Data of the Observation of the Communicative Behavior in the pre speech-language audiology intervention assessment

It´s appropriate to mention now that it was not possible to apply the ABFW Infantile Language Test – part A in S1/S2, due to the oral language level of the children described in the Observation of the Communicative Behavior; therefore, it was not possible to carry out the phonologic analysis.

Significant evolutions in the communicative development were observed during the speech-language pathology intervention sessions, mainly for S3 and S4. These children therapy sessions included not only strategies to stimulate all language aspects, but also, and mostly, they were structured to directly intervene in the phonologic system.

Pre intervention assessment		S1	S2	S3 and S4
Gesell and Amatruda Behavior Developmental Scale	Adaptive	10 months	9 months	2 years and 6 months
	Gross motor	10 months	9 months	3 years and 6 months
	Fine motor	10 months	11 months	3 years
	Language	9 months	8 months	3 years
	Social-personal	10 months	10 months	2 years and 6 months
ABFW Infantile Language Test – part A (unexpected phonologic processes for the age)		Not carried out due to restricted orality.		SR; CR; FP; PB; LS; A. S3: also showed SA and PD.

Subtitle: SR: syllable reduction; CH: consonant harmony; FP: fricative plosivation; PB: palatal backing; LS: liquid simplification; A: affrication; AS: syllable addition; PD: plosive devoicing.

Figure 3 - Data of global and phonologic development in the pre speech-language audiology intervention assessment

The results showing this communicative evolution, as well as the most significant evolution for S3 e S4 are in Figures 4 and 5.

The performance age of four years and six months for S3 e S4 in the Gesell and Amatruda Behavior Developmental Scale does not represent delay in development, according to the rules of this procedure.

Post intervention assessment	S1	S2	S3	S4
Age	5 years and 3 months		5 yeras and 4 months	
Observation of the Communicative Behavior	Communicative intention. Jargon, symbolic gestures, phrases with 4/5 words. Verbal shift start. Communicative function: protest, instrumental, informative and heuristic. Understanding of simple and complex orders related to the mediate and immediate context.	Communicative intention. Jargon, symbolic gestures and phrases with 3 words. Infrequent verbal shift start. Communicative function: protest, instrumental, informative and heuristic. Impaired understanding of simple orders related to the immediate context.	• Good speech intelligibility. • Narrative communicative function; • Understanding of composed orders related to the immediate and mediate contexts.	• Speech intelligibility impaired by phonologic processes. • Narrative communicative function with difficulty to keep a chronological sequence. • Understanding of composed orders related to the immediate context.

Figure 4 - Data of the Observation of the Communicative Behavior in the post speech-language audiology intervention assessment

Post intervention assessment		S1	S2	S3	S4
Gesell and Amatruda Behavior Developmental Scale	Adaptive	4 years and 6 months	3 anos	4 years and 6 months	5 years
	Gross motor	4 years and 6 months	4 years and 6 months	5 years	5 years
	Fine motor	5 years	4 years and 6 months	5 years	5 years
	Language	5 years	4 years and 6 months	5 years	5 years
	Social-personal	5 years	4 years and 6 months	4 years and 6 months	5 years
ABFW Infantile Language Test – part A		SR; PD; LS.	SR; LS; PF; FV	PB; LS.	FP; LS.

Subtitle: SR: syllable reduction; PD: plosive devoicing; LS: liquid simplification; PP: palatal backing; FP: palatal fronting; VF: velar fronting.

Figure 5 – Data of global and phonologic development in the post speech-language audiology intervention assessment

DISCUSSION

Differences as to the pre, peri and post natal complications between the pairs of twins are verified by the analysis of the data regarding their clinic history (Figure 1). The twins S1/S2 had greater complications when compared to the S2/S3, what indicates a bigger delay in the neuropsychomotor development, besides of the presence of the first words in lower age. The intercurrences happening during the childbirth and the first infancy are frequent in twins and are considered risk factors to the child development[5,6]. Prematurity and low weight at birth are some of the biological risk factors which influence the child development[11]. Monitoring the language development of twins from birth to the 26th month, a study did not verify any disorders in the beginning of the language, but it verified disorders in the language quality since the family reported difficulty in understanding the children speech, reporting the speech as very simplified[3].

The communicative profile (Figure 2) of S1/S2 in the pre speech-language audiology intervention assessment was not similar to the profile observed for the S3/S4; however, we must take into account the age difference between the pairs. Between S3 and S4, the difference in the communicative standard is verified only for the expressive vocabulary of S3, but the two children showed delay in the communicative development. Comparing S1 and S2, it is possible to verify that both showed delay in the communicative development, but S2 showed a greater loss (use of jargon and indicative gestures without intending to communicate; impaired understanding of simple orders). This same child presented more severe post natal complications (hydrocephaly and a greater delay in the neuropsychomotor development). A study which monitored families of twins since pregnancy[16], verifying the infantile development, observed a differentiated language development, one of them was more efficient in the oral language. Another study[3] which looked at parents' reports did not indicate any disorders in age acquisition, but it indicated disorders in the acquisition quality since parents reported difficulty in understanding the children language, besides considering it often simplified.

The communicative profile of S1/S2 was already composed of jargon and indicative gestures by the age of 2 years and 5 months. Outlining the communicative profile of children with a typical language development, a study[17] verified that it is possible to check from the age of two the beginning and the maintenance of talks with short shifts.

Although the communicative development of S2 had been lower than the development observed for S1, they both had similar global development in the pre language therapy assessment (Figure 3), and the language was the ability with the greater loss. Doing the same comparison between S3 and S4, the same performance is verified for the brothers, what allows us to consider delay in the adaptive, fine motor, language and personal social abilities (from seven to thirteen months old), since this assessment procedure considers as delay the difference bigger than six months between the child development and the chronological age[13]. The literature[9] reinforces the influence of the pre, peri and post natal complications in the child development, but it also reports similarities in the children abilities learning process, what starts being observed by the family too.

The comparison between the developments of the pairs of twins showed a bigger deficit in the global development of S1 and S2. Children who live surrounded by biological and psychic risks in their first years of life are more likely to developing problems which can affect their development[11]. Furthermore, studies[6,18] indicate prematurity as having a predictive value for delay in the motor and cognitive development. Although the two pairs of twins were born premature, S1/S2 were extreme premature (being born in the 27th gestation week). It´s considered premature, all infants born before the period of 37 gestation weeks. It´s is extreme premature, all infants born before 29 gestation weeks and having a very low weight (<1500g)[18]. Due to the immaturity of the organic systems and to the environment of the neonatal Intensive Care Unit, the birth of a premature is accompanied by many complications and health conditions of the baby, what increases the risk of disorders in the infantile development[6,18]. The quality of social interactions may minimize the impact of factors such as the prematurity in the infantile development[18].

Children with neuropsychomotor development delay will have more difficulties to act independently while taking part in dialogic and social interactions, what influences their language development[4].

The analyses of the acquisition and development of the phonologic system pre language-speech audiology intervention (Figure 3) were only possible for S3/S4 as S1/S2 did not show an oral language sample enough for the assessment and could not name the images neither repeat the words of the test[14]. Only the unexpected phonologic processes for the age of S3/S4 were described, some of them, such as consonantal harmony, syllable reduction and fricative plosivation are observed in children in the beginning of the phonologic system acquisition since the expected age of stopping the use of these processes is two years and six months according to this study assessment procedure[14].

With the language-speech audiology intervention, a communicative standard evolution was observed mainly for the pairs of twins S3/S4, who in the post intervention assessment (Figure 4) showed narration of facts and stories, the greater language impairment happened in the phonologic aspect. Even having attended speech therapy for a longer period, S1/S2 showed a less significant communicative evolution, they could not perform a narrative at the age of five years and three months. We highlight the pairs of twins practically were the same chronologic age (only a month difference) in the post intervention assessment. A study[8] with phonologic intervention in twins verified evolution in the phonologic system and observed similarity between twin brothers' phonologic systems, which was not verified in this study neither in the pre intervention nor in the post intervention assessments.

Exploring the predictors of the therapy time for specific disorders of language development, a study[10] verified that the initial performances of the children in pragmatic and vocabulary assessments are significant measures for therapeutic prognosis. This may be verified in this study if we compare the pairs of twins.

A study with twins[7] observed a genetic influence increase in the language development between the beginning and the middle of childhood. The authors stated there possibly is activation of genes not specifically related to language, but to social factors as, in this phase, children have a broader social demand, mainly with the beginning of school, what directly influences their communicative development. The communicative evolution observed in the pairs of twins in this study (S1/S2 e S3/S4) is due to the years of speech-language audiology intervention; however, it may be related to this genetic factor as well. The genetic contribution in the manifestation of language and speech disorders in twins was also related, as well as their evolution in the speech-language audiology intervention in the report of a case study[8].

In the global development reassessment (Figure 5), we verified a significant improve of S4 compared to the others, S1/S2 were able to approximate their performances in abilities of the global development to the twins S3/S4, except for the language. Language delays are common in multiples, as well as discrepancies in other areas of childhood development[4].

The analyses of the acquisition and development of the phonologic post language-speech audiology intervention (Figure 5) shows evolution in this aspect for S3/S4, who showed only two phonologic processes not expected for the age. At this time, it was possible to carry out this assessment for S1/S2, who showed unexpected phonologic processes for the age[14], with a greater loss for S2, characterizing, in a certain way, their evolution.

We highlight the intervention was aimed at working with language in all its aspects. However, during the intervention process, it was possible to observe an improvement in many linguistic components, but to a lower degree in the phonologic, what impaired the intelligibility of the pairs of twins' speech and lead this study to a bigger focus in the acquisition and development of the phonologic system. As a consequence, it was aimed to offer a better communicative and interaction quality since even with the structuring of simple phrases, but

with intelligibility in production, it is possible achieve communicative efficiency.

Generally speaking, in twins situations, the siblings differently experience interpersonal circumstances, which do not cause an objective need of linguistic intervention with other interlocutors, what may, therefore, influence in the language development, leading to an atypical process of the development. The proximity of the twins and the way their families face the twin situation may lead to disorders in the identity and singularity formation of each child and, thus, the language acquisition can occur in a disordered way or the language quality may be disordered, one example is the so called secret language of the twins[3,4].

By the results exposed, it was verified that the complications experienced for S1/S2 implicate in the perception of delay in language development in earlier age, as well as in the need of a longer period of speech-language audiology intervention. The same can be verified in another study[4], whose findings highlighted the need for follow up programs for the premature aiming at the prevention of malformations and identification of atypical development predictor variables[18].

CONCLUSION

The pairs of twins showed impairment in the global and communicative development in the pre speech-language audiology intervention assessment, and there was an evolution of the communicative abilities and of the child global development after a long period of intervention.

Although the period of speech-language audiology intervention had been longer for the twins with bigger pre, peri and post natal complications (S1/S2), their performances in the pre and post speech-language audiology intervention assessments procedures were more impaired when compared to S3/S4. So, the interference in the child development occasioned by genetic and environmental factors became clear.

RESUMO

Este estudo tem como tema o comportamento comunicativo de gêmeos com alteração de linguagem pré e pós intervenção fonoaudiológica. Foram analisados dados de dois pares de gêmeos do sexo masculino (S1/S2 monozigóticos; S3/S4 dizigóticos), com diagnóstico de Atraso de Linguagem. Os dados foram coletados na avaliação pré e pós intervenção fonoaudiológica, por meio de: entrevista semi-estruturada com os pais; observação do comportamento comunicativo; e teste de linguagem e escala de desenvolvimento. A intervenção fonoaudiológica teve duração de 34 meses para S1/S2 (de dois anos e cinco meses a cinco anos e três meses) e 17 meses para S3/S4 (de três anos e sete meses a cinco anos e quatro meses). Na avaliação pré intervenção fonoaudiológica de S1/S2 foram observadas intercorrências pré, peri e /pós natais mais graves, com maior comprometimento neuropsicomotor e comunicativo. S3/S4 apresentaram intercorrências pré, peri e pós natais menos graves e o atraso no desenvolvimento ocorreu apenas para a linguagem. A idade das crianças na avaliação pós intervenção foi semelhante, porém, o par S1/S2 apresentou desempenho comunicativo e global com maior prejuízo, mesmo tendo recebido maior tempo de intervenção fonoaudiológica. S3 apresentou desempenho aproximado ao desenvolvimento típico e S4 dificuldades apenas quanto à fonologia e pragmática. As experiências de gemelares, diferenciadas em meio a circunstâncias interpessoais, acarretam desenvolvimento de linguagem atípico, devido à menor necessidade objetiva de interação linguística. As intercorrências pós natais em S1/S2 agravaram o atraso no desenvolvimento infantil, englobando o desenvolvimento comunicativo.

DESCRITORES: Linguagem Infantil; Desenvolvimento da Linguagem; Gêmeos; Fonoaudiologia

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