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Case reports

Drug and alcohol in pregnancy and stuttering – a speech-language pathology case report

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ABSTRACT

Drug use during pregnancy is a well-known risk factor for the manifestation of speech-language disabilities. However, the necessity of studies directed towards drug use and its influence on interventional speech process in cases of alterations of child language and fluency is observed. In this study, clinical history data are presented as well as pre and post-assessment tests (Speech and Language) and the description of an interventional process of a six-year child. The main communication complaint about the child was stuttering. In addition to the child's clinical history, there was also knowledge of alcohol and legal and illegal drug use by the mother from before the moment of conception until this intervention process was reported. The protocols Stuttering Severity Instrument (SSI), Child Language Test (ABFW): phonology, vocabulary, and fluency tests, along with the Checklist of Verbal Communication Skills were applied. Based on these assessments, the child was diagnosed with mild to moderate stuttering, phonological simplifications, vocabulary inferior to that expected for his age, difficulty maintaining communicative turns, simplified narrative skills, alterations in psycholinguistic processes, and complaints from the school about his learning. The child underwent speech therapy in the areas of fluency and Child Language (phonological approach), showing evolution in the post-intervention assessment. Thus, in the present case, it became clear that the concomitant use of alcohol with exposure to cigarettes and marijuana may trigger changes in the acquisition and development of language, fluency and, consequently, learning.

Keywords: Alcoholism; Street Drugs; Pregnancy Complications; Language; Learning; Stuttering; Language Therapy

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INTRODUCTION

Language acquisition and development are shaped by successful social interactions and initiated, for the most part, but stimuli from parents and the family environment. During the phase of speech and language acquisition and development, it is common to observe some disfluencies without apparent effort or tension, such as hesitations, repetition of words, and even an increase in the pause time between question and answer in conversation, due to the child's need for more time to process information[1]. At approximately three years (36 months) of age, children may show speech disruptions due to the natural development of the semantic-lexical subsystem of language, which involves acquiring and broadening vocabulary and increasing the complexity of syntactic structures[2]. However, when these symptoms are accompanied by tension or effort, regardless of the child's age, we can note features characteristic of disfluency, typical of stuttering, which can result in serious problems affecting the child's quality of life if not appropriately treated[3].

The most common causes of the emergence of developmental stuttering are genetic in origin, that is, those of which there is a family history[3]. Some cases of isolated developmental stuttering, however, may be associated with the use of teratogenic environmental factors in large quantities during the first trimester of pregnancy[2]. These may include, for example, the consumption of large quantities of alcohol, which has occurred at increasingly early stages with a greater number of female drinkers and been associated with premature and delayed births, pre- and perinatal complications, and general deficits in intellectual development, learning, attention, and behavior[4]. In addition to exposure to alcohol, the use of marijuana and exposure to its smoke is related to low performance in activities that require visual and sequential memory skills and language comprehension[2,5]. Smoking or even exposure to tobacco smoke is also associated with increased risk of miscarriage, low birth weight, prematurity, perinatal death, sudden infant death syndrome, and cognitive, growth, and developmental problems[5]. High alcohol and drug consumption is prevalent among young people (under 25 years of age) with low educational levels and lower-middle social class[2,4,6,7].

Drug use during pregnancy is a well-known risk factor for symptoms of developmental disorders, including speech-language disorders, because parents' use of alcohol and drugs not only affects the organic aspect but also the environmental aspect of the child's development at any age. Additionally, if the use persists after the child's birth, the high social vulnerability of these families can lead to nutritional deprivation and lack of the environmental stimulation necessary for the child's development, in addition to passive consumption[8].

As is widely known in the literature[9], speech therapy for children with stuttering seeks to smooth speech, provide continuity in verbal expression, and promote the maintenance of fluency, thereby improving the flow of information and a more harmonious, quick, and natural speech. This is accomplished through therapeutic techniques such as exercises to prolong phonemes and slow the rate of speech, as well as motivational work to identify emotions and behaviors involved in fluency and disfluency, reduce tension and negative feelings and/or attitudes, and generate family support to foster an environment that favors the child's communication[9].

As verbal expression approaches a natural rate, the phonological disruptions earlier masked by the disfluencies become apparent, and in the case of children with many phonological processes in their speech, speech therapy based on the Cycles Approach has proven effective. This approach involves raising awareness of the characteristics of the target sound to be acquired by choosing two target sounds and their respective stimulus words to be used during the auditory bombardment[10].

The purpose of clinical case studies that address issues like the possibility of licit and illicit substance abuse is to alert speech therapists to the need for a complete speech-language evaluation, including fluency and language-related issues, and in cases where there are reports of alcohol and drug use in the families of children being treated, making it possible for these families to receive more extensive social support and monitoring.

Therefore, the aim of this study was to demonstrate the importance of researching the clinical and family history of a child whose parents were alcohol and drug users when the initial complaint that brought the child to speech therapy was disfluency.

Case Report

The study was carried out during a Supervised Clinical Internship in Fluency, through the Speech Therapy Clinic of the Bauru School of Dentistry – University of São Paulo (FOB – USP). The parents

were informed about the methodology to be used and agreed to the institution's standards, granting written authorization for the use of data gathered during these visits for purposes of teaching and research.

The case in question refers to a six-year-old male first-grader in a regular public school who was referred to the School Clinic by the principal of the school in which he was enrolled and by the child's parents with a complaint of disfluency.

This study was approved by the Ethics Committee for Human Research of FOB - USP (number 108/2011).

Only the mother was present during the patient history interview, and she reported no family history of stuttering on the maternal or paternal side, but reported that she had smoked and consumed alcohol from her adolescence to the present, and that she had five children, of whom the subject of this study was the youngest. The mother also reported that she and her partner began to quarrel during the early months of her pregnancy, which led her to increase her consumption of cigarettes, alcohol, and marijuana. Claiming discomfort in the seventh month of pregnancy, the mother used various means to cause an abortion or hasten the child's birth, including drinking tea of rue and cinnamon with painkillers and self-harm, but the child was born at full term through normal delivery, with normal tests and no apparent disability.

With respect to motor and linguistic development, the child began to walk at twelve months and to speak intelligibly at three years of age. The mother reported that residents of the home never stimulated the child in terms of language acquisition and development because, according the mother, the child was not well-received at first because he had lighter eyes and skin tone than the other family members. Therefore, they did not develop affection or the habit of stimulating the child's language through dialogue, stories, or nursery songs. On the contrary, when the child was not understood by an interlocutor, he demonstrated atypical reactions such as stamping his foot, slapping his thigh, or sighing repeatedly. This triggered negative reactions from family members, such as exposing the child to teasing, punishment, and the use of profanity. At the time of the initial interview, his behavior was agitated and nervous. According to a report from the school principal delivered by the mother during the interview, the child had little contact with other children in school due to shyness, and there were reports of learning difficulties. After this initial contact, the mother was referred to the Social Services Sector of the Clinical School.

RESULTS

Speech Assessment

Speech and language assessments, including hearing, language, and fluency tests, were conducted at the start of treatment in order to obtain a diagnosis and guide planning for the intervention process.

Information about speech fluency and the severity of the child's stuttering was obtained using the Stuttering Severity Instrument (S.S.I.)[11] and the ABFW Child Language Fluency Test[12], designed to identify disruptions and measure the speed of speech.

Other aspects of language were assessed using the Verbal Communication Skills Checklist[13] for practice and the ABFW phonology and vocabulary tests of child language[12], as well as the Percentage of Consonants Correct (PCC)[14], making it possible to analyze phonetic inventory, phonological organization, expressive vocabulary, and speech intelligibility in order to monitor the progress of the intervention, since this measure provides an objective assessment.

Additionally, in order to discover possible auditory disorders and to investigate air conduction thresholds and speech audiometry, a Danplex model DA65 audiometer and a *Siemens* model SD50 immittance meter were used to measure tympanometry and acoustic reflexes.

Pre-intervention assessment data

The fluency assessments showed that the child demonstrated moderate stuttering for preschool stage children, with a score of 23 on the SSI protocol[11], and a speech rate lower than expected for six-year-old children, according to the ABFW test[12].

On the Verbal Communication Skills Checklist, the child displayed difficulty in turn-taking and narrative with simplified language, making use of gestures. Moreover, on the ABFW phonology test[12], the child showed phonological simplifications such as fricative plosivation, velar posteriorization and anteriorization, palatal anteriorization, and simplification of liquid phonemes that are atypical for his age. Similar performance was observed in the vocabulary test for the categories of clothing, food, furniture and utensils, occupations, places, toys, and musical instruments. Finally, hearing problems were ruled out by data indicative of normal hearing on the auditory assessment.

Speech Therapy

Speech therapy occurred in two 50-minute sessions per week. Initially, the primary goal was to improve fluency, and the secondary goal was to work on pragmatic and semantic aspects. The period covered by this report includes three academic semesters (approximately 12 months), totaling 48 therapy sessions. The speech therapy intervention sought to improve the child's motivation with the goal of encouraging the use of oral language even when stuttering disfluency interfered; the child was urged to prolong syllables in which the disfluency occurred.

In all the sessions, the parents were also counseled to talk more with the child and to react in certain ways towards the child's difficulties, to respect their communicative turn-taking, not to interrupt while the child was speaking, not to shout or tease, and to avoid increasing the tension and anxiety reported and demonstrated during oral expression.

Given that the parents surprisingly did not miss speech therapy sessions, while the school reported excessive absences of the student, a regular weekly family orientation was established with the help of the School Clinic's social worker in which the parents were kept informed of the child's progress and instructed in therapeutic strategies that could be applied in the family's home. Moreover, they were counseled about the importance of school attendance for both academic instruction and social interaction, and they took on the responsibility of bringing a monthly school attendance report. This strategy proved effective, as school administrators reported an improvement in the child's school attendance.

The social worker also convinced the mother to seek medical care at a public hospital for the damage that alcohol and drug use had caused to her body; unfortunately, the father refused treatment for his addiction.

Over the course of the therapy, as the disfluencies diminished and the child began to self-monitor, he was encouraged to elaborate longer sentences describing his daily life and retell stories, achieving an appropriate rate of speech and, consequently, lengthening his periods of fluency. His results improved (Table 1), reaching a total score of 6 on the SSI[11] protocol after 30 therapy sessions, which falls within the normal range. However, it was observed that the child had great difficulty understanding the instructions for the activities.

Table 1. Results of the ABFW Fluency Test in Pre- and Post-therapy Assessments

	Pre-therapy average score	Post-therapy average score	Expected average score*
Words per minute	18.7	53.4	76.9
Flow of syllables per minute	45.81	93.0	134.1
Percentage of discontinuity in speech	15.8%	4%	3%
Percentages of stuttering disfluency	10.9%	0%	0%

Expected scores were obtained from the instrument's manual[12]

To eliminate some phonological processes, the Modified Cycles Approach[10] was used in 18 sessions, which involves the constant use of phonetically balanced words during game activities and auditory bombardment at the beginning and end of each session. It should be noted that a few adjustments were made in the application of that model, such as stimulating phonemic awareness (especially syllabic segmentation) in order to decrease the phonological processes of omission and stimulating phonetic aspects at the beginning of each session in which a new target sound was introduced (with synesthetic tactile clues and, particularly, the use of vocalization prompts).

At the end of three semesters (approximately 12 months) totaling 48 sessions of intervention, the child, now seven years old, was reassessed and showed improvement in the clinical symptoms, with increased vocabulary and asystematic phonological changes as seen in Tables 2 and 3.

Table 2. Speech intelligibility – Percentage of Correct Consonants (PCC) in Pre- and Post-therapy assessments

	Pre-therapy average score	Post-therapy average score
PCC – Imitation	53.7%	86.11%
PCC – Naming	44.44%	82.22%
Degree of severity of speech disorder – Imitation	Moderate to severe	Slight
Degree of severity of speech disorder - Naming	Severe	Slight to moderate

Table 3. Results of the Post-therapy ABFW Vocabulary Test and Expected Scores for this Age*

Categories		–Scores (%)	Expected Scores (%)
Clothing	DCV	60%	80%
	ND	0%	0%
	PS	40%	20%
Animals	DCV	100%	70%
	ND	0%	20%
	PS	0%	10%
Food	DCV	86.67%	90%
	ND	6.67%	5%
	PS	6,67%	5%
Transportation	DCV	81.81%	70%
	ND	9.09%	5%
	PS	18.18%	25%
Furniture and Utensils	DCV	81.82%	65%
	ND	66.67%	5%
	PS	29.17%	30%
Occupations	DCV	30%	45%
	ND	30%	25%
	PS	40%	30%
Places	DCV	8.33%	70%
	ND	16.67%	5%
	PS	75%	25%
Shapes and Colors	DCV	70%	85%
	ND	20%	5%
	PS	10%	10%
Toys and Instruments	DCV	63.64%	70%
	ND	18.18%	10%
	PS	18.18%	20%

Key: DCV – Designation by common vocabulary; ND – No designation; PS – Process of Substitution
Pre-therapy assessment was not possible due to the child's lack of cooperation.

According to parents, the disfluencies decreased and only some phonological simplifications hindering the child's speech remained.

DISCUSSION

The case study was carried out to investigate the relationship between disruptions in fluency and language and prenatal exposure to teratogenic environmental factors like drugs, cigarettes, and alcohol. An evaluation of the child's clinical and family history was a crucial complement to the results of speech-language tests in defining a therapeutic approach, in both a professional sense and as a challenge to professionals in the field of health. Studies indicate that data concerning the use of illicit substances during pregnancy is scarce because users delay reporting their drug use for fear that they will be unfavorably judged by health professionals[7], which did not occur in this case.

In the present study, because there was no family history of stuttering[3], the observation of other risk factors corroborated the findings of various authors[2,4-7] who found more risk factors are present in individuals without a family history. These risk factors found in the case presented here are the use of alcohol and drugs during pregnancy (according to the parents' accounts) and delay in language acquisition, as the child only began to speak at the age of three[3], which can be explained by the high exposure to drugs in the prenatal period and the lack of stimulation from parents during the child's first years of life.

With regard to the child's behavior, it was observed that when the child was alone with the therapist during the sessions, he showed a more affectionate and uninhibited behavior pattern with less frequent stuttering; but according to the parents, when the child was unable to produce the desired word or was not understood by his interlocutor, he usually demonstrated atypical behavior such as stamping his foot, slapping his thigh, or sighing repeatedly, which provoked negative responses from family members[15]. In light of this, the parents were counseled on the importance of reacting differently to the child and appropriate strategies to improve his vocabulary, practice, and fluency[9]. However, the parents considered that their regular attendance at speech therapy sessions was sufficient.

The intervention strategies to improve fluency and motivation, exercises and games to prolong and "stretch" phonemes, telling stories, and retelling daily events[9] demonstrated positive and quick results in the present case. Similarly, speech therapy using the Modified Cycles Approach facilitated the development of new phonological patterns through multi-sensory stimulation for the purpose of developing phonemic awareness and producing the target sounds. To accomplish this, cycles were used in which exercises focused on each phonological standard for three weeks by choosing two target sounds and employing their respective stimulus words in the auditory bombardment.

When each cycle ended with the attainment of a score of 50% or better on an assessment, another more complex phonological process was begun[10]. This model proved effective, in that after 18 sessions, the phonological processes were only asystematic and the child's speech was more comprehensible.

In addition to disorders in his expressive language, the child was observed to have great difficulty understanding instructions and statements in the therapeutic activities. According to various authors[2,4,5,15], these symptoms can be found in cases in which there was use of alcohol and exposure to smoke in the first trimester of pregnancy.

Despite knowing that other complications such as psychosocial and cognitive problems arising from the use of drugs may appear over the course of the child's life[4,5], the present study did not investigate the behavioral and neuropsychological aspects of the child, due to the parents' failure to attend sessions. Similarly, numerous attempts to work jointly with the school to counsel and coordinate with the teachers were unsuccessful. However, the receptivity of the child and family and the professional approach taken with regard to the reports made it possible to gather detailed information on the factors that triggered the child's fluency and language disorders, to understand and obtain favorable results in speech therapy.

CONCLUSION

Although this study was designed to investigate the relationship between prenatal exposure to teratogenic environmental factors such as drugs, cigarettes, and alcohol and disorders in fluency and language, it became clear that even in the presence of these explicitly reported factors and other risk factors, it is important that the speech therapist and the entire team receive the patient's family warmly so that they feel welcome.

In the area of child speech therapy, there are crucial data that can and should be perceived or investigated by the professional even when they are not reported directly by the family. These include high social vulnerability, a lack of basic health care, the absence of a stimulating environment for lack of knowledge and access, economic hardship, and problems with school attendance, among others.

In the case reported, it was clear that intense and concomitant alcohol, cigarette, and marijuana use during pregnancy and the lack of a stimulating environment affected the child's development from infancy until the beginning of speech therapy and contributed to the child's language and fluency disorders and, consequently, to his learning difficulties. Speech therapy represented a point of support for the family that opened access to treatment, knowledge, and information about services that could aid in family members' social environment and health, consolidating the joint action of speech therapy with the social community structure.

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