

Communication on Educational-therapeutic method in language development in children with trisomy 21: A review

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Abstract— *This paper provides general information on the language of children with Trisomy 21, on their development and on the methods of educational-therapeutic intervention. I defined the means of applying of Total Communication in the development of communication and of the language in 21-trisomic children. Mental retardation in 21-trisomic children impairs learning ability in many fields, with a negative impact on children's communication ability; these communication possibilities should be improved throughout their entire life. This paper highlights the methods of intervention using Total Communication, the evolution throughout therapy; the therapy will continue in order to attain the objectives determined within the complex educational therapy program. An early educative intervention contributes to the systematisation of all chances of obtaining a more rapid psychological development of 21-trisomic children until the level becomes easy to achieve.*

Keywords: *Communication, Trisomy 21, Language.*

I. INTRODUCTION

Trisomy 21 (Down Syndrome) represents a chromosomal condition caused by the presence of an extra 21 chromosome. Chromosomes are microscopic structures present in each cell within each body tissue and they carry the plan of all characteristics we inherit. People have 23 pairs of chromosomes in each cell, 46 in total; a set of 23 chromosomes is inherited from the father, while the other set of 23 from the mother. The name "Down" comes from the English physician Langdon Down, the first to describe this syndrome in 1866, approximately 100 years before this extra chromosome was discovered.

1.1 Characteristics of language in children with Trisomy 21

Children with Trisomy 21 have frequently display dissimilarities in muscular surface or in spatial structure, with a negative influence on their verbal possibilities (Lautenslager, Peter, E. M., 2005). These differences include:

- hypotonia;
- muscles that are more relaxed and flaccid than normal and harder to control (the muscles of the lips, of the tongue and of the jaw);
- the mouth can be smaller compared to the normal size of the tongue;
- the tendency of breathing through the mouth, which leads to enlarged adenoids and tonsils, to frequent allergies and colds (Carlstedt K., Dahllof G., Nilson B., Modeer T., 1996).

The aforementioned issues can affect the intelligibility of the child's speech in various ways. Hence, children have problems concerning the following:

- the articulation or the ability of moving and controlling the lips, tongue, jaw and palate in order to emit correct and clear sounds;

- the fluency or ability of speaking in a rhythmic and fluent manner;
- the sequencing, the ability of uttering sounds in the right order within words;
- the resonance, tone and quality of the speech sounds produced by children (nasalized or insufficiently nasalized sounds).

When they start school, issues related to reading/writing emerge; starting from the skill of using the writing instrument to the acquisition of the first and of the last letter in the alphabet, the child embarks on a very long and difficult journey. The signs of dyslexia and dysgraphia manifest on a much more serious scale among these children and they are hard to overcome. Many of them remain dyslexic/dysgraphic or even alexic / agraphic, but some of them manage to acquire reading/writing and the elementary orthographic rules (Logan Oelwein, P., 1995).

The speech of 21-trisomic children can be “*telegraphic*”, a present-time speech, scattered with grammar mistakes and syntax mistakes. Another important aspect is the “*impressive*” language: parents/educators must speak clearly, on a slow pace and using simple words, repeating words within sentences (Cibbens,J., 2001).

Gaps between receptiveness and expressiveness. Trisomic children do not attain the same level in all branches of language; some skills are more advanced than others are. These children have better receptive skills than expressive skills, (i.e. transposing thoughts and ideas into words). These children have auditory analysis issues, which interfere with problems of language understanding; hence, they find it hard to sequence the words within a sentence in order to express an idea; this is the so-called gap between receptiveness and expressiveness. discovered.

1.2 Intervention stages in language development and communication in children with Trisomy 21:

The main aspects of intervention in language development and communication in children with Trisomy 21 are the following:

- a. the intervention must begin as early as possible, benefiting from the help of everybody involved in therapy;
- b. the assessment of children’s evolution from various perspectives (medical, psychopedagogical, etc);
- c. the direct implication of parents and of the entourage of 21-trisomic children;
- d. the prompt intervention by defining the concrete objectives in order for them to be understood in a determined period;
- e. the ordering of educative objectives from the easiest to the most difficult one;
- f. the maintaining of acquisitions regarding the children’s behaviours.

1.2.1 Intervention during the verbal period in children with Trisomy 21

In the following lines, we will outline the development of the vocabulary, the articulation of sounds making up words, the construction and comprehension of utterances and of their grammatical organization (Kotlinski, J. and Kotlinski, S.,2002).

1.2.1.1 Sound imitation

It is very important, especially in 21-trisomic children, for them to be capable of reproducing – in their wordplays – vowels and consonants. The child must reproduce these elements of language, isolated or combined in syllables and words.

Favouring sound imitation in children: It would be useful to begin with vocal imitation, training the child to control better the peripheral speech organs. We propose several games and exercises with this purpose.

- A. *Exercises for tongues and lips:*** In order to speak, one must control lip and tongue movements. Most Trisomic children have a hypotonic tongue and for exercises one can use solid foods for an excellent mouth muscle exercise, in order to acquire control on the tongue and the lips (Fletcher,H. and Buckley,S., 2002).
- B. *Correct acquisition of inhaling and exhaling:*** In order to talk, one must exhale the air from the lungs, to be subsequently expelled using the abdominal and intercostals muscles (respiratory muscles). One can help the child control the respiratory muscles through exercises such as blowing candles, blowing in order to move a ping-pong ball, making soap bubbles, blowing a whistle on a certain rhythm, etc.
- C. *Vocal imitation:*** Before asking the children to imitate new sounds, we must determine them to repeat the sounds produced spontaneously. In order for them to imitate a sound, they must also hear it and the recommendation is to capture the children's attention and to stimulate their auditory system (Lauteslager, Peter, E.,M., 2005).
- D. *Sensitizing the child to the physical characteristics of the sound:*** In order to sensitize the child to the physical characteristics of the sound, one must vary the intensity, height (low and high tone), duration and rhythm of sounds. In order to sensitize the child to vocal tone variations, he/she must be spoken to in either a loud or a whispering voice.
- E. *Locating the origin of sounds:*** In order to teach children how to locate a noise or a sound, various items will be placed in different spots and then agitated in turns in order to issue various sounds. At the beginning, certain assistance is necessary by directing the children's heads towards our hand, in its turn pointing to the sound source.

1.2.1.2 The one-word stage

Parents of 21-trisomic children ask, "When will my child start speaking?" Generally, the words they are so eager to hear will emerge when the child reaches what we call *the one-word stage* (Giralametto, L., 2000). This stage begins when a child uses articulate speech – when he/she uses sounds or combinations of vowels and consonants to represent objects, people or an alternative language system as representations signs.

Parents teach children that the world reacts to the sounds produced by interpreting the sound patterns of children (Kumin, L., 2012). The first "words" can actually be more like uttered gestures but over time, both the receptive and the expressive language improve. Often, these children are taught how to communicate using the system of *Total Communication* – a method that combines gestures and sounds.

1.2.1.3 Total Communication

Total Communication comprises the combined use of signs and gestures with speech in order to facilitate the development of communication, a fact demonstrated by clinical trials and experiments. This method requires all the forces of trisomic children in order to learn a system of transitory language until they manage to speak. Parents are worried that the use of signs may delay the development of speech, but the opposite is also valid because without the use of signs these children – who usually understand more than they express verbally – sometimes become frustrated and they scream or even stop making themselves understood (Mervis,C. and Becerra,A., 2003).

The purpose of using Total Communication is to endow the children with language systems making them capable of communicating with the others and of making their desires known. Regardless of the system used, the first signs used are “more”, “done” and “no”; these systems help children communicate their desires and control whether the action continues or stops. Over time, sign vocabulary will be chosen individually, by the demands of each child and of their family.

- Generally, the signs chosen for the children must:
- encourage them and lead them to an improvement of communication;
- be functional in order to be introduced in daily activities;
- easy to use.

For the use of Total Communication, we recommend:

1. The inclusion of sign patterns and of speech patterns. It is not indicated to focus only on signs, because this may lead to forgetting to use the words.
2. Making sure that the adult is regarded by the child when presenting the sign pattern or the verbal pattern. They watch the child while talking to them.
3. The use by the adult of the “hand on hand” system when teaching the children to make a sign; they must place their hand on the children’s hand and to move their hands in order to teach them how to make the sign;
4. Making sure that the signs taught to the children are useful, understood by them and practiced during daily activities.
5. Encouraging children to produce sounds while using signs, repeating the words after children made the sign, responding clearly to the signal as if we talked to them.
6. Assessing whether the members of the family, the persons contacting the children can understand them or respond to their signs.

Stimulation triggered by the environment: The constant stimulation of the children’s language is done through activities conducted normally; the persons within the children’s entourage (parents, siblings, grandparents, friends) will be taught how to proceed in various activities.

Learning words and concepts: In this stage, educators focus on teaching important words and on making them comprehensible.

In the following lines, we present several principles to be memorized when teaching words and concepts:

- a) **Language means more than uttered words:** When children learn a word or a concept, educators must focus on the meaning of the word and make sure that children understood them well through the play method or through multi-sensory experiences. One can also use Total Communication by teaching the concept associated with the sign (Stoel-Gammon,C., 2003).
- b) **Ensuring multiple models:** Trisomic children require many repetitions and experiences to learn a word. When learning the concept “in”, one must use as many actions as possible and designate the action every time. For instance, the educator puts a nest in a box, an apple in a basket, a handbag in the car; he pours juice in the glass, puts an envelope in the mailbox, a toy in the toy box and for all these actions, the educator mentions the word “in”.
- c) **Using objects and real situations:** When a child learns a concept, the educator uses many of the daily activities and real situations in order to get the child understand the concept in question.
- d) **Learning, not testing:** Language stimulation should not involve “work”, “practice”, because after a while the children withdraw and refuse to participate in the exercises, to repeat the words
- e) **Reintroducing the concepts taught by using toy object during play:** After children learned a sign or a word, educators will reintroduce them during play (Stoel-Gammon,C., 2003).
- f) **Generalizing concepts:** Trisomic children have difficulties generalizing, applying the skills acquired in a similar situation. Once children learn the basic concept for a word, other words will be included in the concept in question (Mervis,C. and Becerra,A., 2003).
- g) **Repeating the child's words:** When children try to utter a word, the word will be repeated. Repeating will ensure a correct model of the word, but the educator should not insist on pronunciation at this stage
- h) **Following the child's indications:** If they show some interest for an object, a person or an event, they will be told the word to designate said person or object. The recommendation is to focus on the interest shown by children and to use this interest to teach them new sounds and words. For instance, if they show interest for a toy ambulance, you should talk about the colour and the size of the toy (Pueschel S.M., 1990).
- i) **Receptiveness to the child's communication attempt:** By repetition, the children are shown that they are listened when speaking; when you are not sure what the child said, ask again.
- j) **Helping the child during communication:** As soon as children understand the concept and start using the word or the sign, they are given a clue in case they forget to use it.

Using paralinguistic clues: Paralinguistic clues are rhythm, accent, voice inflexion and emotion, singing-like pronunciation of the word, which will contribute to learning the new concept. For instance, if the child learns the words “small” and “big”, for the word “big” you use a sombre voice, and for the word “small” a quiet, calm voice. In addition, you use an ascending intonation for the word “up” and a descending intonation for the word “down” (Pueschel S.M., 1990).

The one-word stage is very important because in this period, parents can ensure to the child the experience necessary for accumulating a great number of words. However, do not insist very much on teaching many concepts at the same time, because children may feel tired and burdened by too many tasks required at the same time.

II. SOLUTIONS AND RECOMMENDATIONS

A trisomic child may progress considerably in all fields, especially in the field of interest here, mainly the one of language and of communication that we stimulate and train as effectively as possible. This entails a systematic approach through an evaluative appraisal of the details, the development sequences, of language and by using the most indicated intervention principles. The training situation focuses on both the regular family context and the therapy within the speech therapy practice. We believe that the training of family context throughout the entire period of the intervention is a great advantage.

III. FUTURE RESEARCH DIRECTIONS

Another necessity is intervention in the field of socialization through various group games, which would contribute especially to language evolution. In the process of normalizing the lives of these children and for their social, school and professional intervention, early intervention is the first step to make for a successful rehabilitation therapy.

The participation to early intervention programs provides children with the possibility of having a good start, with the purpose of reaching an intellectual maximum and the best adaptive functioning possible.

Parents must be informed concerning the multiple rehabilitation possibilities, the intervention of various specialists: physicians, social workers, educational psychologists, physical therapists, psychologists, etc. Psychopedagogical intervention programs must have continuity, even if they cover long periods (i.e. years).

IV. CONCLUSION

In the process of normalizing the lives of these children and for their social, school and professional intervention, early intervention is the first step to make for a successful rehabilitation therapy.

Early intervention comprises activities specific to speech therapy, social work, medicine, psychopedagogy, unfolding in the first 4-5 years in the life of a child born with a certain deficiency.

The early intervention activity for Trisomic children comprises a series of aspects such as parent counselling, proper explaining of the genetic condition, counselling for the medical issues that may emerge in case of these children, inclusion of children within a psychopedagogical program of complex intervention, as well as other activities. All of the aforementioned activities are possible through the collaboration of a team of specialists.

CONFLICT OF INTEREST

None declared till now.

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