

A Model of Developmental Support for Children after TTTS – Case Study

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ABSTRACT

This paper describes a model of developmental support of a nine-year-old girl, born as a twin in the 27th week of pregnancy, with significant perinatal history. Prenatal examination diagnosed Twin-Twin Transfusion Syndrome (TTTS). Due to premature birth and numerous developmental dysfunctions resulting from it, the girl required the assistance of complex specialist care. However, in the first four years of the child's life, the strategy of developmental support was drastically neglected. The basic aim of the study was to present the author's individual model of support, designed especially for the four-year-old girl together with recommendations of conduct for therapists and the child's parents. The model was developed on the basis of a multi-profile diagnosis, which allowed proposing an individual strategy for intensive developmental support for children after TTTS. Developmental support activities in the proposed model were performed for 58 months, and after this period diagnosis revealed significant changes in the level of functioning of the child regarding ways of responding to communication with the environment. The study confirmed the efficiency of an individual model of developmental support, indicating its beneficial results.

Keywords: prematurity; TTTS; Twin-Twin Transfusion Syndrome; multiple disability; multiple pregnancy; interpersonal communication

INTRODUCTION

Twin-Twin Transfusion Syndrome (TTTS) dates back probably to 1617. At that time Jacob Dirkszoon de Graeff, the mayor of Amsterdam, had two male twins who unfortunately died after birth. The desperate father commissioned a painter to commemorate them on canvas. In this instance, which is essential, the painter stressed differences between the color of the neonates' skin - one pale, the other extremely red. This allowed recognition of twins born with TTTS together with their unequal share of nutrients and oxygen, i.e. distinction between the „donor” and the „recipient”. As indicated by specialists, nearly 100% of twins from complicated pregnancy with TTTS are born before the appointed time (Forsblad, Källén, Maršál & Hellström-Westas, 2007; Quintero, Morales, Allen, Bornick, Johnson & Kruger, 1999; Szymankiewicz, 2010).

According to scientists in the field of medicine, a dozen or so years ago, premature infants would not have any chance to survive. At present, modern therapeutic methods, involving diagnosis, preventive treatment, professional medical equipment, and welfare of medical practice, allow saving increasingly immature neonates, including those burdened with a higher risk of developmental disorders. Statistics show that 28 000 such children are born in Poland every year. This group of neonates born before the 37th week of pregnancy used to be called premature infants. In recent years perinatal mortality in the group of children born with the weight of 500-999 grams was in Poland 47.68 percent, whereas 25 years ago mortality in the same group of children was 86 percent (Hamuda & Kowalczykiewicz-Kuta, 2006; Malinowski & Ropacka, 2003; Preis, Świątkowska-Freund, Leszczyńska, Bidzan & Pankrac, 2010; Szymankiewicz, 2010).

Prematurity is one of the reasons linked with serious developmental and functional consequences, which could greatly limit a child in his or her abilities to cognize the world, understand and initiate changes in their community as well as communicate with their parents and consequently with their community. These difficulties are the bigger and more extensive the more illnesses are diagnosed in a child. The occurrence of numerous disorders and deficits used to be universally called multiple disability (Alfonso, Russo, Fortugno & Rader, 2005; Kornacka & Sonczyk, 2008).

According to scientists, early and precise diagnostics allows implementing a suitable treatment strategy to save children from this group (Als, Lawhon, Duffy, McAnulty, GibesGrossman & Blickman, 1994; Quintero, Morales, Allen, Bornick, Johnson & Kruger, 1999; Świątkowska-Freund & Preis, 2010b).

The clinical picture of TTTS

The reasons for premature childbirth are of varying origin, including multiple pregnancy; the mother's illnesses (arterial hypertension, viral diseases, anemia, etc.); changes in the uterus (uterine cervical insufficiency, anatomical defects of the uterus, myomas); fetus pathology (placenta previa, premature placental detachment, hydramnion, premature rupture of fetal membranes, amniotic fluid infection); significant perinatal history: former miscarriages or dead-births (Blondel & Kaminski, 2002; Feldman & Eidelman, 2003; Kornas-Biela, 2010; Preis, Świątkowska-Freund, Leszczyńska, Bidzan & Pankrac, 2010). One of the complications, i.e. a characteristic exclusion in a multiple pregnancy, is Twin Twin Transfusion Syndrome (TTTS). As stressed by Malinowski and Józwiak (2012), clinical symptoms of TTTS were described for the first time in 1941 by Gillis Herlitz, however, the diagnostic criteria were introduced publicly in 1965 by Rausen et al. (Malinowski & Józwiak, 2012). TTTS occurs when at least two fetuses have a shared placenta with an existing vascular connection. It involves unequal blood flow between fetuses and consequently, an unequal distribution of nutrients and oxygen. The „recipient” is usually bigger and he or she receives a bigger quantity of blood, but he or she is in danger of complications such as problems with respiration, with the digestive system, heart as well as brain damage. The „donor” receives a too small quantity of blood and in effect, he or she develops anemia. However, his or her internal organs are less overloaded in comparison to the „recipient” (Michałus, Haładaj & Chlebna-Sokół, 2009; Ropacka-Lesiak, 2013). As indicated by sources, the frequency of the occurrence of TTTS ranges from 10% to 15% of the whole number of single chorionic pregnancies, the so-called third placental circulation (Blondel & Kaminski, 2002; Forsblad, Källén, Maršál & Hellström-Westas, 2007; Preis, Świątkowska-Freund & Pankrac, 2010; Quintero, Morales, Allen, Bornick, Johnson & Kruger, 1999).

As stressed by researchers, premature infants differ from neonates born on time not only in terms of their physical appearance, i.e. thin, transparent skin, lack of or weakly developed subcutis, but first of all functional disorders, including immature respiratory and immunological systems, the fragility of blood vessels and limited auditory ability (Alfonso, Russo, Fortugno & Rader, 2005; Feldman & Eidelman, 2003; Preis, Świątkowska-Freund, Leszczyńska, Bidzan & Pankrac, 2010; Świątkowska-Freund & Preis, 2010a).

The consequences of premature birth can be of a complicated nature and the development of a premature in-

fant sometimes depends on his or her birth weight and the pregnancy week in which he or she was born. Prognoses as to premature neonates depend primarily on the maturity of their organs and tissues (Bidzan, Preis, Senkbeil, Świątkowska-Freund & Pankrac, 2010; Blondel & Kaminski, 2002; Forsblad, Källén, Maršál & Hellström-Weistas, 2007; Quintero, Morales, Allen, Bornick, Johnson & Kruger, 1999). The most frequent prematurity problems, appearing just after childbirth, include: retinopathy (damage of immature blood vessels in retina and accumulation of free radicals); respiratory distress syndrome (RDS) involving problems of independent respiration resulting from insufficient maturity of lungs, the circulation system and a shortage of the surfactant reducing the surface tension of pulmonary alveoli; jaundice (a sudden increase in disintegration of erythrocytes resulting in appearance of bilirubin), which can cause the jaundice of the nuclei of the base of the brain, which consequently causes very serious neurological disorders; septicemia (a heavy general infection of the body, as a reaction to pathogens and their toxins in blood); disorder of carbohydrates metabolism (hypoglycaemia and hyperglycaemia); necrotizing enterocolitis (NEC), which can lead to intestine perforation or intestines breaking; anemia; bronchopulmonary dysplasia, often turning into asthma; hypothyreosis; organic heart disease (unobstructed Botall's duct); intraventricular hemorrhage, periventricular hemorrhage (originating from the paraventricular matrix - immaturity of the capillary network) and interstitial hemorrhage (vasogenic damage in the neurocyte proliferation zone), causing hydrocephalus, abnormal psychomotor development, damage of sight and hearing, cerebral palsy; risk of infection, as a consequence of lowered immunity and lack of necessary antibodies; early damage to the central nervous system, caused by hypoxia and intraventricular hemorrhage (periventricular leukomalation, also called hypoxic-ischemic encephalopathy - HIE); feeding problems (e.g. lack of sucking reflex) (Als, Lawhon, Duffy, McAnulty, GibesGrossman & Blickman, 1994; Chrzan-Dętkoś, 2012; Chrzan-Dętkoś & Bogdanowicz, 2010; Quintero, Morales, Allen, Bornick, Johnson & Kruger, 1999).

A theoretical depiction of developmental support activities

For children from the population of perinatal risk, the scope of early intervention involves a great number of specific activities, including preventive, diagnostic, and therapeutic activities as well as those involving counseling on specialist care for families of children with developmental disorders. Interventionist activities are aimed at: imple-

menting activities supporting extensive development and education of children with developmental disorders; organizing forms of specialist assistance; introducing activities supporting child development to parents and caretakers, stimulating in the area of personal communication (Przyrowski, 2011). Correct assessment of developmental disorders in a child should take into account the scope of his or her over-subjective needs. Consequently, the assessment should include: early detection of existing disorders in psychomotor development; correct nursing, correct developmental standards; the early start of stimulation of correct development in all its spheres; motor rehabilitation, compensating the occurrence of disorders; pedagogical therapy, speech therapy, psychological therapy; learning interpersonal communication; secondary prophylaxis regarding psychomotor, emotional, and social development as well as speech development; early and complex education; using specially designed stimulating therapeutic methods as supporting activities (Przyrowski, 2011).

The development of children born from pregnancies with TTTS - research review

The world literature seldom presents findings concerning the assessment of psychomotor development of children born from pregnancies during which TTTS developed (Szymankiewicz, 2010). The relevant examples can be found in the findings of a group of Australian researchers, in which they showed that the development of children born from pregnancies during which TTTS developed is not different from the development of children from the comparison group (twins without TTTS). Children below the age of 3 were examined with Bayley Scales of Infant Development (BSID) and with the Stanford-Binet Intelligence Scales. Intellectual disability was diagnosed if results were lower by two standard deviations. These criteria were accepted for both tests. The average result in the intelligence scales appeared to be about 8 points lower in children born from pregnancies during which TTTS developed (before the 33rd week of pregnancy). No difference between the „donor” and the „recipient” was found in respect of results obtained in the intelligence tests. In compliance with the binding criteria, intellectual disability was not diagnosed in children born from pregnancies during which TTTS developed. The final test results are influenced by the diagnosis of cerebral palsy (paralysis cerebri infantum) which in the investigated group seems to appear more frequently (Dickinson, Duncombe, Evans, French & Hagan, 2005). Other Australian studies, involving a group of 62 children showed that some children born from pregnancies during which TTTS developed

revealed slight neurodevelopmental disorders (McIntosh, Meriki, Joshi, Biggs, Welsh, Challis & Lui, 2014). A group of American researchers presented the results obtained at the 33rd annual meeting of the Society for Maternal-Fetal Medicine in San Francisco showing that the general level of cognitive functions in children born from pregnancies during which TTTS developed was normal (Vanderbilt, Schrager, Lanes, Hamilton, Seri & Chmait, 2013).

The aim and the assumptions of the research

This study aims to show the effects of the effectiveness of the therapy designed for a girl with TTTS, implemented for 58 months. The basis of influences was the author's individual model of support conduct whose main assumption was to develop in a child possibly effective independence in establishing interpersonal communication in his or her own community. The obtained results were supposed to allow the assessment of the efficiency of the individually applied support model.

Research methods and tools

In the research the author used the following research methods and tools: analysis of medical documentation, taking into consideration the course of pregnancy (single/twin; high-risk/normal), live births (multiple/single), the perinatal period (results in the Apgar score), anthropometrical parameters of a newborn (gestational age, birth weight, sex); conversation with the child's parents connected with the case history; participating observation; an individual method of child developmental support. In his contacts with the child the author used the following research methods and tools: Callier-Azus Cognitive Scale, PIC-Pictogram (Pictogram Ideogram Communication), Picture Communication Symbols (PCS); MAKATON Dictionary; pictographic puzzles; Receptive Communication Scale, Expressive Communication Scale, Language Scale, Fine Motor Scale, Gross Motor Scale, Motor Scale.

Case description

The girl was born in December 2009 in a small town in the Mazovia region, Poland, in the 27th week of twin pregnancy, which is regarded here as extreme prematurity, with extremely significant perinatal history. TTTS was diagnosed prenatally. Because of the threat of asphyxia and hydramnion, the pregnancy was terminated with a Caesarean section. The girl was born with a bodyweight of 950 g. The girl scored 2 in the Apgar score. She appeared to be the „recipient” neonate, with general edema. After the childbirth, the girl was diagnosed with such complications as: respiratory failure (RDS); pulmonary hemorrhage; plasmatic and

thrombocytopenic diathesis; innate infection; secondary infection; hyperbilirubinemia; secondary anemia, periventricular leukomalacia (bilateral encephalopathy) and premature retinopathy (of 1st degree). The clinical diagnosis by The International Centre of Hearing and Speech revealed a bilateral sensorineural hearing loss of a profound degree, which resulted in cochlear implantation in the right ear. Further investigations revealed binocular short-sightedness, which was a consequence of premature retinopathy, and the convergent squint of the left eye after surgical treatment; nystagmus (corrective glasses were applied). Moreover, the girl revealed intellectual disability in a moderate degree on the verge of a severe degree. The biggest problem was motor disorders of the cerebral origin (cerebral infantile paralysis - bilateral hemiparesis, hypertonia). At the age of four the girl could not walk, she could neither take the standing position nor sit independently. Other disorders included: head hold instability; global delay in psychomotor development and delay in speech development.

The multi-profile assessment of the child's functioning before introducing the therapy model

The assessment of the level of functioning of the four-year-old girl was performed on the basis of diagnoses using the Callier-Azus Scale, which allows determining the range of skills, the communication level, and the general psychophysical development. The diagnosis was broadened by an assessment of the functioning of senses: hearing, sight, touch, taste. At the same time, the level of development of aural reactions was defined. As a result of using the Callier-Azus Scale, it was possible to indicate the level of the child's developmental age, estimated for the third-fourth month of life, in which the zone of the nearest development falls on the sixth month of life. In the first part of the assessment sheet for the gesture development and use of a specific symbol and, an abstract symbol, the examined girl reached the level of a child aged 4 months. In this area, the girl reacted to stimulations in a reflexive manner; she tended to turn towards stimuli irritating her mouth, tightened her fingers on an object placed in her palm; she anticipated events resulting from the daily routine: she became energetic, tense, smiled, became irritated or cried. The examined girl recognized several familiar objects and situations and responded by smiling or crying. The girl operated objects - she initiated the movement with her hands as the aim of observation of her own movement; she associated certain activities after being provided with characteristic objects, she expressed her feelings with facial expressions and by crying. The zone of the nearest development in this domain was defined as the sixth month.

In the second part of the sheet concerning receptive communication, i.e. responding to communication, the girl showed functioning at the level of a developmental stage near the fourth month. She exhibited reactions to stimulations in the manner limited to reflexive changes in her behavior while ticking, stroking, rocking; she gave in to reactions of appeasement and consolation when she was crying; she revealed reactions to interesting events caused by an adult, for instance, she focused her sight for a little time; she could distinguish the intonation of the speaker's voice and showed it by smiling when the speaker's tone was friendly and by crying as a result of the speaker's voice becoming louder and angrier; she responded to familiar movements initiated by an adult and could associate familiar objects responding by smiling or crying. The examined girl was responsive to several signals used permanently in the same situations as tactual instructions by predicting a tactual game, e.g. the „poor crayfish is coming up” nursery rhyme. The zone of the nearest development in this area was defined also as the sixth month of life.

In the third part of the scale concerning the level of development of expressive communication, the examined girl revealed the degree of attained developmental stage at the level of the second month of life. She showed behavior allowing her to establish contact with others through crying, liveliness, e.g. bowing her back, turning her head away, and smiling. The girl gained and maintained an adult's attention through smiling. Except for the above-mentioned forms of contact, she presented no other signals of communication with her relatives. What hindered her in her efforts to achieve higher levels of the described sphere was the state of high muscular tension, making it impossible for her to try and control them. The nearest sphere of development in this area was defined as the second month of life. This state meant that planned support should be concentrated on forming a skill of controlling the girl's muscle tone.

In the area of cooperation, the examined girl revealed the level of development at the stage of the third month of life. In relations with other people, she stopped her behavior with regular pauses, e.g. she opened and closed her mouth, then paused and moved her hands, next she paused and moved her hands again. She focused her attention for a moment on the adult's facial expressions, speech, or gestures, e.g. she looked intently at the interlocutors' faces, turned her head upon hearing a voice. She tried to display behavior the aim of which was to establish contact (crying, looking at the interlocutor, liveliness, bending her body).

The girl could pay attention to objects which the adult moved close to her - she looked, smiled, or showed nervo-

usness by bending her body or by crying. In situations in which the adult, mainly her mother, left the girl alone, she showed nervousness by crying. The zone of the nearest development for the examined girl in this area was defined as the fourth month of life. The girl attained her own best result in the area of receptive communication, involving reactions to communication, i.e. the fourth month of life, and in the area of understanding gestures and symbols in interactions, she reached the level of the fourth month of life. However, the girl had the poorest results in the sphere of the purposefulness of communicative expression, that is the second month of life, the poorest results, and cooperation (the third month of life).

Visual perception

The ophthalmological diagnosis in the examined girl showed esophoria (operated in 2009), hyperactivity of inferior oblique muscle of both eyes, nystagmus, and the vision defect of left eye +4 and right eye +3. At that time corrective spectacles were applied. The examination performed in the natural day environment and the presence of her mother, using a sheet for assessing visual functions and behavior controlled by sight, the girl reached the level of vision development comparable to the seventh to twelfth month of life. The findings showed that the girl reacted to faces focusing her sight for a moment; she followed moving objects; she looked at bright and colored objects with high contrast; she smiled in an interaction with an adult, e.g. her mother; she shifted her look from nearer objects to farther ones; she shifted her look towards a sound source; she examined visually her nearest environment; she happened to bring her hands closer to her eyes, however, this operation lacked signs of intention and purposefulness; she shifted her look from one object to another; she recognized familiar objects well with liveliness and smiling reactions.

The girl had the following difficulties: she had clear problems with a convergent position of her eyes while looking at a given object; she lacked precision in shifting her look, she lacked the ability to locate objects introduced into the circumferential area of vision; she made no attempt to hold out her hands towards objects; she was not interested in details of complex objects; she was not interested in presented pictures. Moreover, the visual range after introducing a stimulus (a colored toy and her mother's face), did not exceed 6 meters; she fixed her sight in the central part of the central line of her body; she had difficulty fixing her sight in the circumferential part of her body.

She could follow an object to the right and the left from the central line of her body; she had slightly bigger difficulty tracking from the top to the bottom of the vi-

sual field; she could not follow diagonal or circular movements. The examination revealed a lack of convergence - the light reflections test on the cornea showed a squint. The preferred distance in observation of visual stimuli was approximately 30 cm. The girl tended to lose visual attention in the field of a circuit and from the top to the bottom. Her eye-tracing reactions were definitely delayed and short-lived, caused by a lack of body-neck control.

Aural perception

The examined girl revealed deep hypacusia (<90dB) of the left ear and the right ear. In 2009 she was provided with an implant in the right ear. The examination, performed in natural conditions and a familiar environment, aimed at checking her reactions to aural stimuli. Responses to prove the auditory threshold appeared after exceeding the sound intensity of 20dB. The girl did not react to whispers and quiet speech below 20 dB, at the same time she revealed clear and determined reactions to suddenly appearing sounds, e.g. the sound of an alarm clock - 30dB). The girl would react to voices with a normal or friendly tone with a slight preference of the feminine voice, moreover, the girl reacted with a smile to other people saying her name.

The girl revealed signs of searching for changing sound sources. It was ascertained that while the girl was crying, no sound could influence or change her mood.

Further hearing thresholds investigations (more than 70dB) found no doubts regarding the girl's responses to stimuli of such an intensity level. She was able to react to those sounds with firm liveliness, and even with a short freeze, then she would raise her head and look for sources of the heard sound with her sight. Undoubtedly, a considerable and recurrent difficulty for her involved instability of support of her head and inability to maintain her sight on an object for a short time.

Gustatory perception

After determining the contraindications, e.g. allergy, a taste test was carried out in the examined girl and her reactions were observed to gradually introduced basic tastes: bitter (tea), sweet (chocolate cream), salty (salt), sour (citric acid) in order to observe emotions accompanying the substances introduced. The main intention was to obtain information on whether there appear any perceptible reactions to gustatory stimuli in the examined girl. Consequently, the sour and salty flavors caused a standard moistening reflex, eye winking, and motor stimulation - hypermytonia. Administering substances of a pleasant favor, e.g. chocolate cream entailed clear relaxation, willingness to opening her mouth, expressing an evident

preference. Administering bitter flavor did not cause any perceptible reactions. Information coming from gustatory cells confirmed the occurrence of correct, differentiated reactions to administered substances together with a preference for the sweet flavor and with a small, almost imperceptible reaction to the bitter taste.

Tactile perception

The examined girl was subjected to tactile stimulation. Touch in the form of massage, stroking regions of upper and lower limbs and the chest in a lying position caused positive emotions, relaxation, clear comfort, and signs of eye contact. However, the same touch turned out to be undesirable in the orofacial zone. During those activities, the examined girl decidedly bent her head and her body backward, which consequently caused an increase in the muscle tone. All pressures in the same body parts, i.e. lower and upper extremities, palms, feet, caused signs of curiosity, freezing and clear expectation of another movement. No additional negative reactions to this kind of touch were observed. What is more, the activity of blowing through a straw towards different body parts of the examined girl made her smile and then laugh. During those times, the girl would freeze with a smile, awaiting other sensations. Stimulation with different textures did not cause any fundamental signs of emotion in the child, but the area of her face appeared to be definitely oversensitive to any tactile intervention.

The strong points of the examined girl, favoring correct development, included her interest in the nearest environment and people already known to her. Such a state allowed an assumption that the examined child shows susceptibility to any type of stimulation and suitable developmental support program. It was assumed that the greatest difficulty was the high level of progressive muscle tone.

Since extreme neglect in the girl's psychomotor development was revealed, an individual procedure was designed to support the development in the following areas:

- The area of motor activities involved reduction and monitoring of the child's muscular tension, including the activity of bending and extending of an arm (a manipulative game involving grip, touch, throwing an object); using NDT Bobath method to reduce pathological reflexes, abnormal patterns, and muscle tone; SI Sensory Integration of atrioventricular and proprioceptive sensations using different textures, temperature consistencies, and vibration.

A SERIES OF TASKS OF INDIVIDUAL THERAPY FOR DEVELOPMENTAL SUPPORT

Table 1.

The author's idea of a therapy model

THE AIM IN PHASES OF THE THERAPY	THE DETAILED AIM OF THE THERAPY	SPECIFIC FACTORS	TECHNIQUES
Phase 1: Improvement of the level of the subjective mood and the self-confidence Duration: 10 therapeutic hours /five times per week /18 months of continuous support supervised by a specialist	Constructing a strategy of therapeutic support	Learning rituals in the therapy and consolidating them; accepting the established model of work in therapeutic sessions	Method NDT Bobath, Sensory Integration SI, Picture Communication Symbols - PCS
	Stabilization of good mood	Activation of internal resources	A receptive technique of combining sounds based on emitted colors and sounds
	Training to establish the feeling of self-confidence	Improving one's ability to be aware of the attained success in motor stimulation	A musical accompaniment to movement; vibroacoustic stimulation; „my greatest dream” improvisation
Phase 2: Stimulation to perform tasks by providing support instructions with sensations Duration: 10 hours of support / five times per week / 20 months of support of experiencing successes from task fulfillment	Working on the intensity of performing tasks	Improving the level of the intensity of one's activity	Improvisation according to one's favorite pattern of sonic and rhythmic supplements and motivation in social functioning
	Working on the improvement of motivation in social functioning	Motor-imaginational therapeutic stimulation; constructing alternatives of movement; freedom and flexibility	A variety of parameters of objects in free improvisation (rituals)
Phase 3: Improvement in „general functioning” and changes in regards to extending manners of independent resourcefulness Duration: 10 hours of support / five times per week / 20 months of support	Testing new flexible, reflexes and experiences	Practicing new forms of interaction through non-verbal communication	Ch. Knill's Method; The author's own exercises, taking into account light sources
	Generalization regarding attempts of independent development of manners of resourcefulness	Stabilization of one's attained aims - improvement; the farewell	Augmentative and Alternative Communication evolution of behavior regarding resourcefulness

Source: the author's study

• The area of communication involved designing a systematized set of gestures during daily nursing activities appropriate to the child's capabilities, such as feeding, taking the child in one's arms, using outside sources: sound, touch (during bathing and washing - tactile contact with water), smell (particular scent before massage), signs (e.g. Picture Communication Symbols - PCS) - as allowing the girl to predict situations and reinforce the feeling of safety, focus on the reception of particular stimuli, prepare the body neurophysiologically. In regards to the communication elements, Ch. Knill's method will be used in order to arouse activity and encourage to take action and show one's own initiative. Moreover, other methods and tools which will be used include: Receptive Communication Scale, Expressive Communication, Language Scale, Fine Motor, Gross Motor. The accompanying music was con-

nected with basic activities, e.g. rocking, opening one's hand. In this communication the Augmentative and Alternative Communication method was included, involving working on concretes, i.e. using particular matter-of-fact PCS pictures. While playing with the child, and consequently arousing spontaneous linguistic communication, simple verbal training was introduced using particular accessories, e.g. playing with a spinning top (speech sound: u), playing with a pompom (speech sounds: o, a), playing with a spring (speech sound: i), playing with a shawl involving putting it on the head and taking off (speech sounds: o, a). Playing in front of the mirror, while respiratory exercises were used in order to develop the feeling of agency, focus on the speech apparatus and modulate breath; additionally, contact with water involved the motor exercises.

- In the area of perception, the main challenge was determined as follows: developing the skill of looking, observing; and tactile stimulation to reduce muscular tension; as well as stimulation with sounds. In order to achieve that: the distances in the visual field were increased; the time of looking at an object was lengthened; interest was increased making daily care objects more attractive. Methods used included finger games; tactile system stimulation; SI method (nature material, various textures, consistencies). The child's senses were influenced, including gustatory and olfactory senses. Contact with the participation of a therapy dog was used (poly-sensory stimulation) in order to arouse positive reactions; stimulations in participation in certain activities and positive reception of the changing environment, dancing in the water of variable temperature (swimming pool).
- In the area of self-reliance, the intensified speech therapy intervention was introduced, with special regard to the development of the activity involving biting off and chewing pieces of solid food.

The chosen therapeutic activities used for 58 months with relation to the case described aimed at improving the girl's general psychophysical state; satisfying all her possible developmental needs and preventing her from secondary developmental disorders (regression); forming manners of interpersonal communication. Any interventions towards the girl were performed in the presence of her parents included in active participation in the therapy [27]. The support stimulation was accompanied by:

1. Verification of the previous activities aimed at improving the level of the child's general physical development;
2. Introduction of supportive and alternative individual forms of interpersonal communication in domestic conditions;
3. Continued intensification of the developmental support process in the urgent mode in cooperation with an expert group involving medical doctors and therapists;
4. Inclusion of parents in cooperation in terms of active therapy and stimulating socializing tasks - a cycle of instruction and training;
5. Minimization of an extremely increased status of spasticity by using suitable positions preventing the excessive body stiffening, for instance,

THE COURSE OF SUPPORT THERAPY

Table 2. Examples of developmental support exercises

<p>A series of momentum exercises (in a sitting position in an orthopedic chair):</p> <ul style="list-style-type: none"> • Request to hit a balloon with photos of her family members on it, situated in front of the girl; • Climbing on a horizontal bar in games called „chimney sweep climbing up the ladder”, „chimney-sweep coming down the ladder”; • Throwing an object off a chair in order to achieve agency of action (with a „wow” effect), scattered confetti, sonic, and lighting effects. • Playing with a shawl attached to the girl's wrist with a rubber band; • Using vibrating toys in order to reduce muscular tension as much as possible; • Massaging the shoulders (quick balancing horizontal and vertical movements); • Motor activities in a swimming pool.
<p>A series of momentum exercises (in a lying position on one's back):</p> <p>The lying position with legs drawn in, protected sides (a blanket around the head), an attempt to reach for a photo of a family member;</p> <ul style="list-style-type: none"> • Request to indicate the girl's own head, nose, and ear; • Request to stroke her head/hair; • Motor activities in a swimming pool.
<p>Exercises involving lying on side, one leg bent, supported, stabilized, protected head:</p> <ul style="list-style-type: none"> • Massaging the shoulder blade to provoke hand movements forwards; • Warm massage of the shoulder-blade (heat stimulation); • Trying to reach for a ball; • Attempts to indicate photos of family members; • Playing with a shawl attached to girl's wrist;
<p>A series of manual exercises:</p> <ul style="list-style-type: none"> • Hand massage; • Horizontal bar exercises (pushing and pulling the horizontal bar); • Knill's method exercises (levels: 1st, 2nd, and a special level); • Therapy session ends with relaxation with the possibility of using Shantala Massage or listening to a fable or a rhyme.
<p>A series of dog activities (pet therapy): The appropriate part includes:</p> <ul style="list-style-type: none"> • observation, following the dog with one's sight; • listening attentively to the dog's barking while its location changes; • stroking a dog, close contact with an animal: lying close to it; • showing various photos/pictures • increasing the distance of a shown picture representing the same dog; • imitating dog barking by the therapist • aloud, silently, from afar, from close range; • singing simple songs about dogs; • touching the dog's nose, tongue, fur with one's hands or single fingers; • feeding a dog.
<p>The closing part:</p> <ul style="list-style-type: none"> • touching the place where the dog's heart beats, relaxing on a mattress, and parting with the dog.

Source: the author's study

- during activities, e.g. lifting, carrying, changing diapers, bathing;
6. Changing the lying position regularly: on the stomach (a roller or a wedge), at the same time holding one's hands outstretched forward and supporting the girl and lifting her head; when the girl was lying on her side, one hip and one knee were bent with a blanket in-between, preventing them from joining (relaxation of the body); on the back: bending hips and knees to prevent the body from stiffening and protracting;
 7. Providing the sense of security by requiring the presence of the parents during routine-developing activities and to indicate the regularity of using activities: 'kangooring', 'nesting', 'scarfing';
 8. Minimizing the child's developmental difficulties by exercises and sensory stimulation in such a manner that it can obtain a potentially higher possible level of motor, intellectual, social, and emotional development;
 9. Improving the family's psychical condition to fulfill its educational, protective, and therapeutic function for the girl;
 10. Regular verification of the efficiency of the applied forms of contact with the child;
 11. Instructions for the parents in regards to using the tactile stimulation method (Shantala Massage) and the tactile system stimulation as manners to arouse positive emotions and relations with the child, cause a beneficial mood, spontaneous contact, relaxation, and reduce muscular tension.

In order to present a complete picture of the results of measuring methods used regularly after each 12-month period of the performed activities, data were presented in the table below (Table 3).

The Callier-Azus scale was used in periodic measurements taking into consideration the scope of changes in the level of revealed skills; the level of receptive and expressive communication; individual psychophysical development; the level of aural relations; understanding concrete and abstract symbols; the reaction of facial expressions and reflexes; expression of feelings; the level of occurrence of muscle tone. The measurements were generalized regarding the final assessment of the area of the girl's development in relation to her able-bodied peers in the development scale in months of life. In order to achieve this goal, the measuring methods indicated above were used.

As can be assessed, the applied support model provided the girl with an opportunity to overcome her developmental difficulties effectively. The support program aimed at minimizing the degree of deficits of the psychophysical character and eliciting the full potential for establishing interpersonal communication in the environment.

The research measurement was effected before the individual support session in 2015 and after it, i.e. in October 2019. The participating observation took into account areas of skills of an individual case, i.e.: the area of competence: reflexes, self-control, face mimicry; accompanying preservations, reactions of satisfaction; the area of the social functioning: interpersonal functioning, responsiveness to situations from the environment; motivation to do exercises; the area of practical activity: remembering ob-

Table 3.

The scale of progress in the multi-profile assessment of the functioning of the examined girl with TTTS within a period of 58-month therapy

No.	TECHNIQUES IN THERAPY within a period of 58-month therapy	12 MONTHS AGE OF 5	12 MONTHS AGE OF 6	12 MONTHS AGE OF 7	12 MONTHS AGE OF 8	10 MONTHS AGE OF 9
1	NDT Bobath Method	3 months	5.2 months	6.4 months	8.2 months	9.1 months
2	Sensory Integration SI	1.5 months	1.8 months	2.2 months	3.2 months	4.6 months
3	Picture Communication Symbols - PCS	1.5 months	1.9 months	2.5 months	4.1 months	7.9 months
4	Receptive Technique of Joining Sounds	1.1 months	1.9 months	2.6 months	4.4 months	7.2 months
5	Musical Accompaniment to Movement	1.1 months	3.1 months	5.2 months	8.2 months	12 months
6	Vibroacoustic Stimulatio	2.1 months	2.8 months	3.9 months	9.5 months	15 months
7	Free Improvisation in Manipulation with Objects	2.1 months	3.5 months	4.5 months	6.3 months	12 month
8	Ch. Knill's Method	1.6 months	2.5 months	5.3 months	7.4 months	11.3 months
9	Augmentative and Alternative Communication	2.2 months	3.2 months	6.2 months	8.2 months	13.2 months

Source: the author's study

jects, understanding their intended use, motor efficiency. The sheet took into account risk factors of occurrence and repetition frequency factors (the course of changes due to a low level: result < 65-79%, an average level: result 66-79%, a high level: result > 80%).

RESULTS

The research involving participation in the therapeutic cycle allowed observing the following changes in relation to the period preceding the beginning of the individual model of the girl's developmental support:

- The therapy resulted in minimizing the dynamics of growth of the existing abnormalities in the girl's psychomotor development, hindering regular activities of the therapy supporting her psychomotor development.
- The applied therapy reduced the intensity of the occurrence of symptoms of respiratory disorders, resulting from the unsatisfactory maturity of the lungs and the circulatory system, insufficient for independent respiration.
- The girl displayed independent attempts to establish interpersonal relations together with attempts to maintain the course of the narration and action of parties.
- The author noticed a reduction of the occurrence of symptoms of secondary disorders and selected abnormalities in the area of psychomotor, emotional, and social development,
- The girl showed a reduction in the muscle tone, which decreased from a high level.

The above-mentioned changes in the described case were possible to obtain on an average level, however, in relation to the period before introducing the support model, in each area, the zone of the nearest development increased consistently to about 8-10 months on average.

DISCUSSION

The participating observation in a group of category of limitations allowed specifying as follows: a limited subjective character; a kind of rare disease; the complexity of the occurrence of disorders concomitant with TTTS in a multiple pregnancy; the multidimensionality of the analyzed variables; interdisciplinarity; the time of the therapy, full reservedness in establishing interpersonal contacts (Alfon-

so, Russo, Fortugno & Rader, 2005; Als, Lawhon, Duffy, McAnulty, GibesGrossman & Blickman, 1994; Bidzan, Preis, Senkbeil, Świątkowska-Freund & Pankrac, 2010; Kornas-Biela, 2010; Malinowski & Ropacka, 2003; Pease & Pease, 2018; Vanderveen, Bassler, Robertson & Kirpalani, 2009).

The obtained results support the belief that the cycle of support tasks for communication development and the girl's psychophysical development should be aimed primarily at providing assistance in his or her experiencing the outside world and improving defense mechanisms in a sufficiently changed quantity so that the child can systematically improve his or her own ability to modify and neutralize extreme inhibitions and limitations. In the continuity of systematically organized supportive activities, there is a chance to fulfill social and emotional development training of the described case. The risk level of the occurrence of difficulties in psychosocial and motor adaptation in the girl seemed to be very low. Participation in a specially selected model of support stimulation; there appeared an opportunity to introduce a planned improvement in: the quality of emotional functioning and communication with the environment; increasing the level of adaptation to unexpected changes in the environment; increasing the need for maintaining contact with other people; showing possibilities of experiencing acts of success, recognition, and acceptance of one's own achievements. There was a significant improvement in the states of the nervous and emotional balance of the child. It was decidedly easier to overcome problems in adaptation to the requirements and expectations of the environment. There was a significantly positive change in the status of the physical form of the child's body with a tendency to assume the erect position. Due to the significance of the problem, the issue investigated by the author requires further interdisciplinary research in enlarged research groups.

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