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Vojta therapy in the diagnosis and the suck–swallow–breathe triad treatment of a prematurely born child

SUMMARY

The number of premature births, both in Poland and in the world, has increased prominently in the last two decades. As a result of the progress of medical science and the experience of neonatal ward personnel, mortality among the examined groups of premature children has decreased. Specialists of infant development faced with new challenges, one of them being the food intake that is substantial for children's survival. The main threat to the proper synchronization of the triad: sucking-swallowing-breathing, for premature babies is a low gestational age and extremely low birth weight. At the third degree neurological units (health center classification), the speech and neuro speech therapists – specialists in early speech intervention therapy and/or physiotherapists – take care of stimulus of primitive neonatal reflexes. In prematurely born babies with positive prognosis, without any neurological complications, the early speech intervention therapy is conducted to accelerate and complete the tube feeding process and begin independent sucking of a baby. In case of infants with moderate or severe damage of the central nervous system, the early neurologopedic speech therapy is conducted to minimize the level of disability and increase the chance of speech motor development. Physiotherapy uses in the therapeutic process, among others, Vojta therapy, as the rehabilitation of the "first line" of a prematurely born child.

Keywords: Vojta method, premature, sucking-swallowing-breathing

INTRODUCTION

Preterm delivery and keeping alive an immature organism, unadapted to the outside environment, is a challenge for contemporary neonatology. Because of the developing medical sciences and growing experience of the neonatal units' staff

saving extremely immature premature newborns, the death rate among the group of children subject to the research has decreased. Specialists dealing with small children development face new challenges. One of them, being the basis for survivability, is breast milk intake (Poore, Barlow, Wang, Estep, Lee 2008: 185). During the first days of life with orofacial dysfunctions early logopaedic intervention may offer therapeutic support (Machoś 2011: 1; Rygielska 2015: 45). Logopaedic stimulation should be performed at neonatal care unit by a neuro speech therapist or speech therapist – a specialist in early logopaedic intervention (Dworzańska, Borowicz-Lech 2016: 11; Bernatowicz-Łojko, Brzozowska-Misiewicz, Twardo 2013: 47). Parents to premature babies usually have the possibility to seek assistance of the staff, qualified in this field, at neonatal care units in tertiary referral level hospitals (Bernatowicz-Łojko, Brzozowska-Misiewicz, Twardo 2013: 47).

The second source of therapeutic assistance may be a physiotherapist. The purpose of this paper is to present the Vojta method in diagnosis and therapy of sucking, swallowing and breathing dysfunctions in premature babies.

PREMATURITY – DEFINITION, STATISTICAL FIGURES

When defining a baby born prematurely, i.e. a premature baby, one takes into consideration two parameters: age (it is a child born after 22 weeks of pregnancy, and before the end of 37th week of gestational age, regardless of the birth weight) and weight (Gadzinowski, Kęsiak 2008: 1; Bręborowicz, Kamiński, Markwitz, Skrzypczak, Wilczyński 2003: 183). In the classification of premature babies, taking into account the birth weight, one should distinguish: newborns with low birth weight (LBW0 < 2,500 g), newborns with a very low birth weight (VLBW < 1,500 g), newborns with extremely low birth weight (ELBW < 1,000 g) and newborns with incredibly low birth weight (ILBW < 750 g) (Gadzinowski, Kęsiak 2008: 6; Gacka 2014: 33–34).

Equally important is the assessment of physical development of a newborn based on anthropometric measurements, i.e. height (in newborns and infants body length), weight and head and chest circumferences. The assessment of development consists in regular measurements, data comparison with the standard values and interpretation of the results. Standard values are presented separately for boys and girls in the form of tables of figures or growth charts (Gawor 2012: 19; Kornacka, Bokiniec 2008: 91). Separate growth charts exist for premature children.

At present, specialist neonatal care units in tertiary referral level hospitals in Poland are saving lives of children born in 23rd week of pregnancy and with birth weight exceeding 500 g. Based on global research, the World Health Organization confirmed that many European countries reported an increase in preterm births indices during the last two decades. WHO name several causes: greater number of twin or multiple pregnancies, due to the use of in vitro procedures (IVF), the

increasing maternal age, the progress of contemporary medicine in rescuing and nursing newborns (e.g. using corticosteroids therapy) (Zeitlin et al. 2013: 1357)

Quoting the authors of the research "Preterm birth time trends in Europe" under EURO – PERISTAT project conducted to monitor the birth-related health condition in the European Union, it must be noted that the indices of premature births in Europe still tend to increase. Annual increase in the number of preterm births was confirmed in 13 out of 19 European countries covered by the research; 13 countries experienced also a significant increase of the number of premature births in multiple pregnancies (Zeitlin et al. 2013: 1358).

In Poland, we can observe the rising trend in preterm births as well. For the sake of comparison, in 2003 the Central Statistical Office (GUS) registered 23,602 pregnancies ended before 36th week, whereas in 2013 the same index amounted to 27,061 preterm births (GUS). The frequency of preterm births in Poland is 6–8% (Urban 2005: 77).

IMPAIRED DEVELOPMENT IN PREMATURELY BORN CHILDREN

For doctors saving lives of a premature newborn the highest priority during the first days after delivery is to control the respiratory distress syndrome (RDS) (Barlow, Lee, Wang, Oder, Oh, Hall, Knox, Weatherstone, Thompson 2014: 178–179) and immaturity of the central nervous system (CNS) (Kornacka, Bokiniec 2008: 77). Children extremely premature suffer from respiratory failure and require support in the form of intubation, mechanical ventilation, CPAP or oxygen box. Until the lungs become mature – which takes place around 36th week of pregnancy – they are monitored. Within 72 hours after the birth, there may also occur periventricular/intraventricular haemorrhage (PVH/IVH), starting in the subventricular matrix. The haemorrhage is associated with difficulties in pulmonary and circulatory adaptation of an immature baby. Though, it does not apply to all premature newborns, just to those with very low gestational age (40% of newborns with birth weight below 1500 g and 60% of newborns with birth weight below 1000 g). It is rare for children born after 33rd week of pregnancy. (Amiel-Tison 2008: 196; Chrzan-Dętkoś 2012: 25). I and II degree haemorrhages to the subventricular matrix and ventricles of the brain, without causing their dilation, generally resorb within next few weeks. Usually, they shall not cause damages to the central nervous system in the future. Whereas III and IV degree haemorrhages significantly influence further psychic and motor development of a baby and are associated with the occurrence of serious neurological problems (Hnatyszyn 2008: 263; Helwich 2003: 38). The consequences of early damages to a developing brain may include cerebral palsy (CP) or/and posthaemorrhagic hydrocephalus. If we combine those risks with other issues associated with preterm births,

including *inter alia* periventricular leukomalacia (PVL), being the consequence of cerebral hypoxia, bronchopulmonary dysplasia (BPD), chronic lung disease (CLD), necrotising enterocolitis (NEC), hyperbilirubinemia, it can be assumed, with very high probability, that the affected child will demonstrate sucking, swallowing and breathing disorders (Kornacka, Bokiniec 2008: 77–78; Bielecka-Cymerman 2003: 42–43, Helwich 2003: 34–38).

REFLEXES DEVELOPMENT IN NEWBORNS AND INFANTS

To understand the correlation between breathing and breast milk intake in premature babies, one should look closer at the calendar of newborns' reflexes development during prenatal growth.

The sucking and swallowing reflexes are developed already during the first weeks of intrauterine life (Stecko 2002: 15; Kornas-Biela 1998: 14; Rządzka 2012: 404). The nervous system is developed at the beginning of 2–3 week of pregnancy. In 7th week of pregnancy, the foetus starts to respond to the irritation of the upper lip with global moves. In 10th week of pregnancy, the mandibular and maxillary area becomes sensory sensitive. 12th week of pregnancy is of significance for the sucking–swallowing–breathing triad, as the foetus opens and closes the mouth, the first moves of chest occur, in the result of which, the diaphragm and abdomen muscles relax, and the phonatory activity begins that takes part in further suction, and the upper lip raises up when touched. During the following weeks (14th and 15th week of pregnancy), a training work begins to prepare the foetus for later breast milk intake, by intensive swallowing and expelling amniotic fluids (a mature foetus drinks around 500 ml of amniotic fluid a day) (Woytoń 2005: 23). It is also a next step of building sensorics inside the oral cavity, preparing the newborn to suck a breast. Vocal cords are fully developed. In 17th week of pregnancy, the foetus sucks its thumb thus irritating the lips and causing their opening, putting out and closing. In 23rd week of pregnancy, the foetus demonstrates preparedness to independent breathing, the breathing muscles are fully developed. A child born after 28–29 weeks of pregnancy has a chance to suck independently because the involuntary sucking reaction is fully developed. Around that time, the coordination of sucking and swallowing develops. In 32nd week of pregnancy the baby gains the ability to coordinate sucking, swallowing and breathing. Those reflexes are maturing during the following weeks of pregnancy (Stecko 2002: 15; Kornas-Biela 1998: 14; Pilewska-Kozak, Bałanda-Bałdyga, Skurzak, Bień, Kiełbratowska 2009: 117–137).

It must be noted that, although the sucking reflex does already exist since 28th week of pregnancy, the sucking is weakened, short-lasting and limited to several lip movements, and therefore ineffective. Before 32th week of pregnancy, the number of movements in a series is 3 or less, and the negative pressure is too

weak; the values for 32nd–33rd week are similar, and no sooner than in 34th–35th week the number of movements in a series is between 4 and 7, and the negative pressure is medium. In 36th–37th week, the number of sucking movements is 8 and more, and the negative pressure is strong. Whereas, the swallowing reflex in premature babies under 27–28 weeks of pregnancy is negative. It is present since 30th week, although it is not always synchronised with the sucking reflex (Amiel-Tison 2008: 131).

SUCKING–SWALLOWING–BREATHING – STANDARDS AND ABNORMALITIES

The proper triad sucking-swallowing-breathing determines further development and efficiency of child's speech organs (Kondraciuk, Manias, Misiuk, Kraszewska, Kosztyła-Hojna, Szczepański, Cybulski 2014: 189). The quality of sucking and coordination of the triad may influence the quality of movement and its performance during further steps of food intake: from a spoon, drinking from an open cup, biting off, biting into or mastication. The same movements which are used during eating shall also occur during articulation. So, the primary activities shall affect the secondary activities, i.e. further phases of speech development (Dworzańska, Borowicz-Lech 2016: 13; Stecko 2013: 10–11; Mackiewicz 2001: 87; Pluta-Wojciechowska 2011: 128–129; Winnicka-Makulec 2012: 192; Witak-Światłowicz 2007: 343–344).

During breast milk intake through the mouth, a baby uses all organs later used for articulation. The tip of a newborn's tongue is short, and the sublingual fold is attached close to it. In the consequence of the sucking movement, the apex extends, the tongue becomes more flexible and prepares for more difficult tasks of mastication and speech (Stecko 2002: 18; Stecko 2013: 11). Rooting reflex allows the newborn to follow the nipple with the tongue. It lifts the nipple to the upper alveolar ridge and the orbicular muscle of the mouth seals it. Then, the tongue is in palatal position and starts the retracting moves. In the consequence, the posterior part of the tongue goes up, to the soft palate, thus closing the air flow from the nose. The baby starts making alternating moves of the mandible. It lowers and retracts the lower jaw, and then lifts it up and presses forward. The synchronization of orofacial muscles leads to creation of a sucking chamber and negative pressure. This phenomenon is also of significance for the growth of and shaping the hard palate. The negative pressure causes palate resorption from the nasal cavity side, and its proper shaping. Thus, there are established proper conditions for the initial tongue erect position moves (Stecko 2002: 19, Rządzka 2012: 408). Breast milk is extracted and transferred by the sucking and mastication movements to the dorsal posterior area of the tongue, and then transported to the oesophagus. All facial muscles take part in the swallowing process. The tongue is put forward, the

orbicular muscle of the mouth is tense, without tensing the muscles of mastication. This type of swallowing is characteristic for the infantile period, and it is correct until all deciduous teeth are in place (until a child is 3 years old). The involuntary execution of the sucking-swallowing-breathing triad going out creates conditions for shaping and maturing the eating functions (biting off, biting into, mastication). The new neuro-motor and anatomic conditions of the tongue movements (growth of jaw and mandible) cause that the tongue starts moving also in the vertical plane. Involuntary sucking, the so-called suckling, is supplanted with the development of eating competence by the verticular pattern, i.e. the up-and-down tongue movement during the sucking pattern – *sucking*. This process commences at the turn of 6th and 7th month of life (Morris, Klein 2000: 90–91).

In a healthy newborn, born at term, the strongest sucking reflex is observed approximately 2 hours after the delivery; if unstimulated, it may vanish as early as on the 5th day. Sucking is one of the strongest primitive reflexes, it may even suppress pain. Proper synchronization of breast milk intake is as follows: breathe in through the nose – five sucks holding the fluid – swallowing (Rządzka 2012: 408). In breastfeeding the triad is not interrupted by breathing in a gulp of air. If the nasal cavity is patent, the baby breathes through the nose. This cycle is facilitated anatomically by high position of larynx and trachea, located three cervical vertebrae higher than in adults.

In case of preterm born children, the triad sucking-swallowing-breathing shall have a distorted image (Boiron, Nobrega, Roux, Henrot, Saliba 2007: 439). The distortion degree shall depend, among other, on the gestational age and weight of the child, neurological maturity of the born child, the phase of development of muscle tone distribution, the maturity of oral reflexes, the type of coexisting dysfunctions (including nervous system malformations, genetic syndromes, anatomical abnormalities), required intubation and the time of mechanical ventilation, the quality of breathing mechanics, the time of feeding with the use of alternative methods, the stimulation of oral functions by medical staff during the child's stay at a neonatal care unit (Zawitkowski, Bartochowski 2000; Bernatowicz-Łojko, Brzozowska-Misiewicz, Twardo 2013: 42).

The method and the quality of feeding of a child shall be influenced by the gestational age, its general condition and body weight (Sullivan, Juszczak, Bachlet, Lambert, Vernon-Roberts, Grant, Eltumi, McLean, Alder, Thomas 2005: 77). Extremely premature newborns shall go through all phases of feeding: from intravenous feeding, bypassing the digestive system and supplied directly to the blood circulation system, through a probe, with the use of which a formula or breast milk is administered through the oral or nasal cavity directly to the stomach, and finally breast / bottle feeding (Pilewska-Kozak, Bałanda-Bałdyga, Skurzak, Bień, Kiełbratowska 2009: 117-–137). Around 34th week of pregnancy (often being the corrected age, not gestational age) vital parameters of babies are usually stable

and a preterm baby is most probably able to coordinate sucking, swallowing and breathing, and with the same, it is ready to begin breast or bottle feeding right away (Witak-Światłowicz 2007: 345; Bednarczyk, Lewandowska, Stobnicka-Stolarska, Szozda, Winnicka, Zawitkowski 2014: 36–39).

In medical history, and from clinical observation it can be noted that during breastfeeding a premature baby has problems with latching the nipple, surrounding it with the lips and keeping inside the mouth, which often results in pushing the nipple out of mouth by the tongue (Masgutowa, Regner 2009: 57). Such child finds it difficult to synchronize sucking and swallowing, its breathing is impeded, and in the consequence the fluid may be aspired to the respiratory tract (DeMatteo, Matovich, Hjartarson 2005: 149). The coexisting muscle tone control disorders may also cause body spasms, leaning the head back, extensor tonus in lower limbs or opisthotonus of the entire body (Banaszek 2004: 65). Clenching the hand with the thumb inside the fist, general nervousness, crying and motor anxiety, are the signs of difficulties in executing the sucking-swallowing-breathing triad in a premature baby (Sadowska, Banaszek 2001: 118).

EARLY PHYSIOTHERAPY INTERVENTION WITH THE USE OF THE VOJTA METHOD

Physiotherapy is an important source of therapeutic support in the sucking-swallowing-breathing triad disorders. At present, there are used two neurodevelopmental therapeutic methods: NDT – Bobath (Mikołajewska 2016: 14) and the Vojta method (Bagnowska 2014: 67–68; Borkowska 2008: 193; Pusz, Stoińska 2008: 556; Bauer, Appaji, Mundt 1992: 37–51). The Vaclav Vojta method is most frequently recommended as the "first-line" therapy (Banaszek 2004: 121) and the diagnostic method, in case there is a risk of cerebral palsy (Gomulska, Sadowska, Krefft, Gomulska, Mazur 2006: 48). As soon as the vital parameters of the newborn are stabilized, and the doctors approve it (one should also consider the gestational age - with extremely premature babies the therapy is normally postponed due to hyperstimulation which is disadvantageous at such early phase) one may begin the therapy (Dytrych 2009: 47). The decision on starting motor rehabilitation should be made as soon as possible, before the child completes 3rd month of life (Dołyk 2008: 210). Often the decision is made on 6th day of life. The basic assumptions of this method result from many years of research conducted by Vojta, who mainly worked with children with cerebral palsy. He assumed that the entire motor development is genetically encoded. Infant's psychomotor performance consists of global move patterns (rolling over from back to belly, sitting up, or crawling) "hidden" in the central nervous system (Surowińska 2013: 18). If the brain does not suffer any neurological losses, the respective development phases shall be smooth, though gone through at an individual pace. If, however, one has

to deal with hypoxic-ischaemic encephalopathy or damaged cerebral cortex, the execution of the genetic plan shall be disturbed (Vojta, Peters 2006: 40). The Vojta method therapy is, first, intended to unblock and repair the genetic matrix.

One of the major problems with orofacial functions in premature babies, at the side effects of feeding through a probe, intubation and artificial ventilation. First, the baby is deprived of proper sensory sensations inside its oral cavity. There is also sustained an overactive pharyngeal reaction, general hypersensitivity of the vermilion zone, gag reflex increased or transferred to the front of the oral cavity (Stecko 2013: 45). Second, the position of the head, leaned back, disturbs postural control. Additionally, with the symptoms of improper distribution of muscle tone, the physiologic lordosis of the cervical spine deepens the curvature into hyperlordosis, the so called reclination. Reclination occurs until approximately 6th week of life, as a development standard. Development of the eye-hand control gradually leads the cervical spine section from hyperlordosis. The first movements of the newborn's head are limited to the craniocervical junction. The movement is performed within the first two cervical vertebrae of the spine (atlas and axis), and rotation of the lower levels of the cervical spine is limited. With proper motor control, neuronal coordination of the work of the muscular coat of the neck on the dorsal and abdominal side, the vertebrae become segmentally extended. Without this stage, the vertebrae shall not be able to rotate relative to each other. This process is directly linked to the control of positioning of the head in the midline, selective head movements relative to the shoulder girdle, efficient swallowing and breast milk intake.

In premature babies with disturbed motor sequence of the triad, with the immaturity of the central nervous system, or perinatal damage, the reclination tends to intensify, and often survives in the persistent form. These include problems with motoric speech control, faulty posture, different types of scoliosis and malocclusions. The muscular coat of the neck consists, among other, of neck erectors (the descending part of the quadrate muscle, iliocostalis cervicis muscle, splenius captitis muscle, splenius cervicis muscle, semispinalis captitis muscle, semispinalis cervicis muscle, longissimus captitis muscle). The muscles on the abdominal side of the neck characterize with lower mass than their antagonists, and include sternocleidomastoid muscle and longus captitis muscle, and longus colli muscle. Increased opistotonus, postural control disorders or forced position in an incubator cause the deepening muscle imbalance. Erectors dominate the layer of flexors, and through their attachments, they pull the head by the occiput over the atlantoaxial joint. The hyperlordosis increases, and consequently, the pathological positioning of the larynx and oesophagus area also occurs. Muscles of the front wall of the neck are even stretched, the hypertonia of the mandible area is deepened, and the position of the tongue and the hyoid bone is altered (Kaczan, Regner 2004: 165).

So, the stimulation with the use of the Vojta method may be started when a newborn is still in an incubator. Therapy intensity is adjusted to the general condition of the child. Initially it is recommended that the stimulation time is short, lasts no longer than a few seconds, to prevent excessive burden of the nervous system. The main purpose of releasing the global pattern is to activate the work of muscles in the anterior neck wall. During the therapy the therapist tries to simultaneously activate the muscle tone of erectors and flexors, which control the positioning of cervical vertebrae. Thus, induced motor reactions mobilize the structures of the nervous system to execute motor patterns (e.g. support on the elbow) from the so called genetic matrix, i.e. mobility programs influenced by genetic factors (Pyda-Dulewicz 2015: 112). This activates nervous centres in the spinal cord, and in subcortical structures responding to stimulation, and force the deep layer of autochthonic muscles (rotators of the deep layer) to segmental extension of the cervical vertebrae.

THERAPEUTIC OPTIONS OF THE VOJTA METHOD

A child is stimulated in supine recumbent position, with the use of the breast zone. It is located between VI and VII intercostal space. The activation causes irritation of the surrounding nerves and indirect and direct stretching of respective muscles and thorax organs (Giannantonio, Papacci, Ciarniello, Tesfagabir, Purcaro, Cota, Semeraro, Romagnoli 2010). The irritation is transferred by various nervous tracts to the central nervous system. These include, among other the nervous tract conducting the impulse through the posterior roots Th6-Th8 during stretching intercostal muscles between VI and VII rib, and the nervous tract running through the posterior roots C1-C4 in the result of direct irritation of diaphragm attachments (Sadowska, Szkolnicka, Banaszek 2001: 190). In response to the nervous stimuli, the longitudinal axis is positioned in the midline. Positioning of head in the same line is possible thanks to even activation of the tone of muscles: longus captitis and longus cervicis relative to the dorsal muscles: longissimus captitis, longissimus cervicis, interspinalis, semispinalis and spinalis cervicis. Only such position of the head relative to the shoulder girdle and pelvis, creates good conditions for the stimulation of the sucking-swallowing-breathing triad. The therapy is conducted 3–4 times during a day, as a maximum. The number of exercises and their duration is always decided individually, depending on the clinical condition of the premature baby. The stimulation is made by the Vojta method qualified therapist, or by medical personnel instructed by the therapist. Over the time, when the newborn's condition allows his discharge from the hospital, and the physiotherapy care is still required, the child's parents are taught further techniques and zones modifications.

To stimulate the triad sucking-swallowing-breathing the therapy also uses spontaneous crawling. The activity in the orofacial area is stimulated by releasing partial movement patterns of facial muscles, muscles of the oral cavity bottom, movements of the mandible and tongue. A starting position for spontaneous crawling is laying the child on the belly. In case of premature babies, the decision on the use of therapy in this position, shall be made by the attending physician. The child should be respiratorily stable, breathing on its own. As a general practice, the spontaneous crawling is most usually used in a rehabilitation surgery, after the discharge from hospital, as the continuance of the early physical therapy intervention. The main zones for releasing motor patterns in that position include: medial epicondylus of the humeral bone, lateral tuberosity of the calcaneal bone and the trunk zone. Proper activation of motor reactions causes the spine segments to straighten up, especially in the cervical section. It begins a game of muscles in the dorsal and abdominal layer of the neck which leads the neck out of reclination. The achievement of the optimal position of cervical, thoracic and lumbar vertebrae in the intermediate position, enables the rotational movement of the head (from the facial side to the occipital side). The movement is also followed by the eyeballs, tongue and there are observed various lips movements, and the corner of the mouth follows to the occipital side. There is released a partial pattern of the complex of spontaneous locomotion, which is the mandibular sideways movement. In the psychomotor development, this movement is observed in the second trimester of life, and is made by the mandible during mastication and pounding solid consistency food in the mouth (Vojta, Peters 2006: 155). In the planned movement, the work is active and the tension of articulation muscles and the muscles in the bottom of the oral cavity is altered. The tongue does no longer have the conical form, typical for abnormality, it lays down flat, pushes to the bottom of the oral cavity and moves to a side. There also appear a very intense swallowing the saliva, and regaining the sucking reflex (Sadowska, Szkolnicka, Banaszek 2001: 236).

Early physiotherapy intervention with the use of the Vojta method, soothes the motor anxiety of the baby, and introduces the so-called motor silence. Thanks to this, as soon as the baby is ready to drink the breast milk (32–34 week of pregnancy), it is much easier to attach it to the breast. Improvement of the muscle and nerve control of the face and neck areas enables the first sucking attempts and mastering the sucking-swallowing-breathing triad with simultaneous proper breathing through the nose. During nursing the baby's head is positioned in the midline. Minimizing the spasms results in the first attempts to fix the sight on the mother's face. Proper positioning of the body during nursing improves the anatomical and spatial conditions of the pharynx area and facilitates the swallowing reflex. A psychological aspect of the motor silence is the facilitation of building

a relation between the nursing mother and her prematurely born child. Her anxiety, and fear of the health loss, adaptation to the new situation also influence the first attempts of attaching a premature baby to breast (Chrzan-Dętkoś 2012: 54).

CONCLUSIONS

Difficulties in executing primary reflexes, breast milk intake and synchronization of sucking and swallowing determine further articulation development of a child (Barlow 2009: 179). Therapists should be fully aware of the continuity of speech development, as specializations of eating and breathing activities (Mackiewicz 2001: 87; Witak-Światłowicz 2007: 343–344; Pluta-Wojciechowska 2011: 128–129; Stecko 2013: 10–11). Speech development is dependent on the efficiency of the nervous system and eating movements patterns: sucking, swallowing and mastication. During the first year of life, the tongue should gradually be erected, which is the guarantor of further proper development of speech. Disintegrated and disturbed reflexes shall delay the process (Masgutowa, Regner 2009: 56). Disturbances in verbal communication, massive salivation, breathing through the mount instead of through the nose, hypotonia of the orbicularis oris muscle, malocclusions are some of the problems faced by parents at the later phases of their child's development. It must be remembered that a significant number of premature babies with burdened perinatal history, shall participate in intensive motor rehabilitation (Levitt 2007: 39). Frequent appointments at the doctor's specializing in neurology and orthopaedics are further steps in the everyday struggle for fitness of the small child. Therefore, one should instruct the carers to prevent them from neglecting the orofacial sphere.

Early logopaedic therapy is of therapeutic significance even before the verbal phase. The Castillo Morales therapy, logopaedic massage, Shantal massage, craniosacral therapy or exercises improving the speech organ, should become standard care element of preterm born babies in the next decade (Sadowska, Zaleski 2004: 11; Peirsmann 2011: 57). It is the task of a therapist (speech therapist, physiotherapist) who cares for the best possible and close to the correct breast milk intake, to use the child's potential to the maximum and prevent the creation of and establishing wrong patterns. To achieve this, the therapist should establish such experiments related to breastfeeding which shall influence the creation of proper nursing functions already in the neonatal care units (Dworzańska, Borowicz-Lech 2016: 13; Winnicka-Makulec 2012: 194).

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