

LANGUAGE AND SPEECH DISORDERS AS A DISPLAY OF PRENATAL AND PERINATAL TRAUMA IN THE CONTEXT OF HUMAN EVOLUTION

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Abstract. Language and speech disorders in children typically are **not isolated**. They are combined, for example, with such syndromes as autism, ADHD, depression, psychomotor retardation, depression, bipolar disorders, schizophrenia, and psychosomatic disorders: asthma, neurodermitis, pyloristhenosis, enuresis, speech disorders, stammering, etc. On the basis of these syndromes lay prenatal socio-psychological distresses which unborn children together with their mothers had been exposed. We can consider language and speech disorders such as these syndromes a result of **prenatal mental trauma**. The genetic mutations found in children with these syndromes could have been passed down from parents and/or could have been formed in children during gestation in a mother's pregnancy complicated by physical and/or emotional distress. The wide prevalence of language and speech disorders in children and their increasing trend worldwide give rise to consideration of these phenomena in the **context of human evolution**. Pregnancy and labor are stages of human evolution when language and speech disorders may spread in human progeny, and are the stages when we could attain success in **prevention of them**.

Problem Statement. Language and speech reflect the human intellect, mental and physical health. For speech and language to develop and be useful, the new born must have words and meanings modeled to them before, during and after birth. We need look no further than the tragedy that happened in Romania during the Nicolae Ceaușescu baby making era when a significant generation of infants and children arrested in their early development stages, grew 'speechless'¹ because they were not spoken to or touched. Speech reflects thinking and connects with mechanisms - sound-word formation, A language is related to meanings, understandings, and to using spoken, written or other symbol systems. - in a word it is about communication!

Where does communication begin?

Analysis by the World Health Organization Departments of Health, showed that the health of populations in various countries over the past decades is deteriorating. Analysts predict an increase of people with psychological and psychosomatic disorders. The prevalence of language and speech impairment seems to show the same prognosis. In the United States, from 6 to 8 million people have some form of language impairment. Approximately 7.5 million people have voice disorders. The prevalence of speech sound disorders in young children is 8-9%. In Canada, the prevalence of speech or language impairment disorders in children is 10.9%. Most of

¹ [Understanding the Effects of Maltreatment on Brain Development](http://www.childwelfare.gov/pubs/issue_briefs/brain.../brain_development.pdf)

www.childwelfare.gov/pubs/issue_briefs/brain.../brain_development.pdf

these children would show some language impairment as opposed to speech problems only: for boys the rate was 15.5-20.7%, and for girls - 19.1-25.1% (Beitchman *et al* 1986). In Australia, the prevalence of the impairment of expressive speech and language is 25.2%¹.

Until now, we do not know the specific cause of the majority of language and speech disorders². Experts know that language and speech disorders in children are not isolated and often are combined with a variety of syndromes and illnesses, which began from birth and even before birthing: from the prenatal period of child's development (Turners *et al* 1988). The Turners showed that when mother experienced a trauma during her pregnancy her baby is born with these charged trauma feelings and mental attitudes. My own awareness of this patterning in language and speech came with a family I once worked with in which the 5 year old boy had not spoken. His mother was able to recognize the shock she had experienced during her pregnancy her mother had died and she had been overwhelmingly traumatized which was exactly the shock her son had been born and lived with all his young life.

Specialists assume that the defect of speech can be the result of diminishing control conditioning by strict parents or a strict teacher, and can connect with delay of intellectual development, and emotional problems for a child. Recently, genetic research showed that the *FOXP* genes are linked to neural development and to speech and language disorders (Takahashi *et al* 2009). *FOXP1* was first identified as the gene linked to an inherited form of mental retardation and speech and language deficits in three unrelated patients (Horn *et al* 2010).

However, the discovery of new gene mutations hardly gives answers as to reasons for their mutations; as well as reasons for clinical diversity of language and speech infringements; and in this connection, about ways of their elimination; and also about their preventive maintenance.

In recent years, prenatal aspects of language and speech disorders have begun to be discussed at International Conferences (Sovilj *et.al* 2004; Jeličić *et.al* 2004; The Turners *et.al* 2006; Brekhman 2006; Gouni 2008). Researchers have begun to state assumptions that language and speech disorders have prenatal roots. Let us continue to investigate the question as to the origins of these disorders, but from some other perspectives.

The purpose of this paper is to compare results of research of some psychological syndromes (autism, ADHD, depression), which often are associated with language and speech disorders from the point of view of their sources; and prevalence for an estimation of commonalities of their prenatal origins; and the opportunities for their preventive maintenance.

What do we know about prenatal sources of these syndromes?

Since the middle of 20th Century, modern Prenatal and Perinatal Psychology has been developing. This scientific discipline has studied the mental and emotional life of the

²<http://www.asha.org/careers/professions/sld.htm>

unborn child and the influence of encodings perceived during the intrauterine stage of development on thinking abilities and behavioral capacities in subsequent life.

The prebirth research by the Turners and other research have shown, that:

- The unborn child (prenate) begins to develop emotional perception.
- The prenatate has rudementally actively functioning memory.
- The prenatate's genetic program (received from parents) secures these. That is why...
- Prenates can include the feelings in memory, of mother's most emotional diminishing thoughts and enhancing wishes as well as her behavior.
- These prebirth impressions are added to the genetic information (received from parents) which form the basis of a child's non-conscious.
- The non-conscious information controls the thinking, emotions and behavior of the person in their subsequent life.
- Maternal psycho-emotional distress can cause mental trauma for a prenatate, and can damage health and development after birth.
- Maternal quiet and creative moments during pregnancy can also promote expressions of the enhancing inclinations and talents for a child via genes and mother's enhancing thoughts and feelings during pregnancy and birth. This aspect of enhancing dedication is illustrated by the incredible creativity of child Hollywood movie star Shirley Temple Black.

Researchers suggest that prenatal mental trauma underlie mental disorders such as autism, ADHD syndrome, psychomotor retardation, depression, bipolar disorders, schizophrenia, and psychosomatic disorders: asthma, neurodermitis, pyloristhenosis, enuresis, speech disorders, stammering. They manifest themselves in different persons with diverse intensity in different times of life after birth (Bettes 1988; Hernandez-Reif *et al* 2002, The Turners *et al* 2007 and others). Let us examine some of them:

Autism is characterized by deviations in social interaction and dialogue, and by limiting, repetitive behavior, and **the delay of language and speech development**. Scientists at the Center for Autism and Related Disorders, in Baltimore, Maryland, USA examined information on 535 children diagnosed with autism and with severe language delays. At age 4, their language delays ranged from "not speaking at all" to "using single words or phrases without verbs"³. From ages 8 to 17 – 53% of them had not become fluent speakers and 70% of them could only speak by simple phrases (Wodka *et al* 2013).

What do we know about the cause of *autism*? Autism can be the result of genetic mutations (Beverdorsdorf e.a., 2001); more precisely - infringement of a gene on xromosome Chromosome 7 (CNTNAP2). Chromosome abnormalities are found in 7.4% (129/1749) of Autism Spectrum Disorders (ASD) cases with a range from 0% to 54% (Bojović, Miletić 2009). Research suggests that ASDs are etiologically heterogeneous: genetic predisposition in conjunction with environmental factors; deficient nutrition or insufficient intake of certain nutritional elements; the impact of fungi, viruses, negatively impact physical and chemical factors (Beverdorsdorf *et al* 2001,

³ <http://www.autismspeaks.org/science/science-news/many-nonverbal-children-autism-overcome-severe-language-delays>

Miletić, Bojović 2009). Genetic mutations predispose children to autism and also may influence the development of the cerebellum and nervous systems from it to other areas of the brain involved in language. It provides a tangible link between genes, the brain and behavior (Alarcón, *et al* 2008).

However, the prebirth infringements of development of cerebellum structure as well as neuronal ways in cerebrum could not be explained by genetic mutations alone. That is why it offered occasion for subsequent investigations. Beversdorf and his team from the Department of Neurology, Ohio State University (USA) found high significance in autism origin of the maternal emotional distress (death of husband, loss of job, moving, others), which occurred in the period 21 - 32 weeks of pregnancy peaking at 25 - 28 weeks (Beversdorf *et al* 2005). These data (besides others) allow considering autism as a result of socio-psychological distress during pregnancy and labor, which the prenatate experienced together with mother.

Thus, today we could suppose that the autism is a result of the very composite interaction of some factors:

- a) maternal social-psychological distress in pregnancy;
 - b) distress in prenatate,
 - c) endocrine-metabolic disorders in their nervous and somatic cells;
 - d) mutations (and/or epigenetic aberrations) in genes of these prenatate cells;
 - e) disorders of development of cerebellum and nerve pathways in the prenatate brain.
- All these, we could summarize as the **prenatal mental trauma** for the prenatate which display clinically after birth as autism.

How often does autism occur in society?

The majority of recent reviews show the level of autism prevalence at 1-2 / 1000 population and about 6 / 1000 population for the disorders of autistic spectrum, though admitting, that the actual quantity could be even higher. According to the World Autism Organization, for the 10 years (1998 - 2008) the number of children with autism has increased by 10 times⁴. U.S. Centers for Disease Control and Prevention data in 2012 estimated that every 88th child in America is stricken with autism - a 23% increase in just two years and a 78% increase since 2000⁵. Russia has no precise statistical data: specialists estimate it from 2-5 / 10,000 to 20 /10,000 children, maybe on the whole there are about 200,000 autistic children⁶.

ADHD Syndrome is 'a highly inheritable childhood-onset psychiatric condition which is characterized by age-inappropriate levels of core symptoms including inattention, hyperactivity and impulsivity'. The organizers of 4th World Congress on ADHD (Milan 2013) gave this definition⁷. Some children with ADHD Syndrome have a complex group of behavioral and emotional disturbances. It includes aggression towards people and animals, destruction of property, deceitfulness, lies, or stealing, general violation of rules, *slow social development, and language/ speech problems*⁸. A significant number of children with ADHD syndrome have also anxiety disorders and depression.

⁴<http://ria.ru/spravka/20120402/615322608.html#13736632834694&message=resize&relto=login&action=removeClass&value=registration>

⁵<http://shine.yahoo.com/healthy-living/cdc-autism-rate-now-1-88-171300743.html>

⁶<http://ria.ru/spravka/20120402/615322608.html#13824389972973&message=resize&relto=register&action=addClass&value=registration>

⁷http://www.adhd-federation.org/fileadmin/user_upload/Congress_2013/Final_2013/V3.Final_Programme_ADHD2013.pdf

⁸<http://health.nytimes.com/health/guides/disease/attention-deficit-hyperactivity-disorder-adhd/other-disorders-associated-with-adhd.html>

Specialists consider that ADHD Syndrome is a result of **prenatal mental trauma**. The scientists of Leuven University (Belgium) have found that ADHD syndrome connects with prenatal stress, with high levels of anxiety in women during pregnancy (Van den Bergh a. Marcoen 2004).

As many as 25% of children with ADHD have bipolar disorder. Manifestations of these problems including episodes of depression and mania (with symptoms of irritability, **rapid speech**, and **disconnected thoughts**), sometimes occurring at the same time. Both disorders often cause inattention and distractibility and may be difficult to distinguish, particularly in children. Children with mania and ADHD syndrome may have more aggression, behavioral problems, and emotional disorders than those with ADHD syndrome alone. In some cases, ADHD syndrome in children or adolescents can be a marker for an emerging bipolar disorder (Baud et al 2011).

Global **prevalence** of ADHD syndrome is estimated about 5% of children worldwide. The rates of diagnosis and treatment of children with such pathology since the 1970s have increased. So, in the UK in the 1970s the ADHD syndrome had estimated 0.5 / 1,000 children, while in the late 1990s 3 / 1,000 children. In the USA, in the 1970s, 12 / 1,000 children had the diagnosis, while in the late 1990s 34 / 1,000 had the diagnosis and the numbers continue to increase⁹: in 1997 just in the USA, 3.3 million children had ADHD Syndrome (Polanczyk et al 2007).

Depression is the next condition related to language and speech problems. Research showed that 11% of the mothers of speech impaired children met criteria for depression compared to 2.5% in the control group ($p < 0.01$). Rudolph *et al* (2004¹⁰) supposed it can be because mothers with depression speak less to their child than healthy mothers do and so their emotional disorder has to be regarded an important co-factor for their child's speech development. But...

Research in Sweden have confirmed inheritability of depression (Kendler *et al* 2006). The genetic roots of depression explain why depression runs in a family and why the children have a propensity to depression from conception, and suffer from it during their lifetimes, even after it would seem of insignificant stressful events, sometimes so insignificant, that occurrence of depression is considered as 'spontaneous'. Frequency of such depression, which is considered as *endogenic*, i.e. without any external influences, is rather high - about 35% of all cases (Tiganov *et al* 1999). The newest research have shown, that the deficiency can be caused by a feature of a gene (5-HTT), carrier serotonin, and reveals itself in cases of very stressful vital events for the person (Kuehner 2003; Surtees *et al* 2006). Scientists in various countries support the idea about the pathogenic role of maternal depression concerning occurrence of depression in the born posterity (Bettes 1988; Zuckerman *et al* 1990, Ponirakis *et al* 1998; Hernandez-Reif *et al*, 2002; Verny 2002; The Turners 2006).

Depression during pregnancy and in the postnatal period comes to light with high frequency - from 6.5% up to 12.9% (Gavin et al., 2005, Le Strat 2011). It often

⁹ <http://www.nice.org.uk/nicemedia/pdf/CG72FullGuideline.pdf>

¹⁰ Universitätsklinikum Erlangen, Germany

promotes interruption of pregnancy: the frequency of premature labor exceeds 20% of pregnant women with depression (Wisner et al 2009).

The depressive condition in the pregnant woman influences the unborn child. It already can be diagnosed right after birth. Children born from mothers with depression, scored low on the APGAR Scale and more often required reanimation for their survival. They cried more often, and it was more difficult to console them. The more depressed the mother the angrier were their children. Subsequently, these children were more inclined to depression and to smoking, use of alcohol and drugs.

The prevalence of **depression** has a wide range, from 3% in Japan up to 17% in the USA (Andrade *et al* 2003). As of 2010, approximately 298 million people suffered depression (4.3% of an aggregate number of the population of the Earth) (Vos *et al* 2012). Depression (major and minor) is one of the basic reasons for morbidity all over the world (WHO 2001). It is important also that depression during pregnancy, and after labor, often is not an isolated condition; it is connected with a wide spectrum of accompanying mental disorders. On the data of research in Germany 2000 - 2004, in 53-61% of persons suffering depression, other psychiatric disorders also were observed: generalized anxiety disorder, panic attacks, agoraphobia and posttraumatic stressful disorders.

Discussion

Analysis of the submitted above materials have shown that language and speech disorders in children are **not isolated**: they often are combined with such psychological syndromes as autism, ADHD, and depression.

What unites these syndromes?

All mentioned syndromes actually have a common factor:

- 1) They all are bound up with pre-perinatal period of human development,
- 2) They all are bound up with interaction of the unborn child with mother and social-ecological environment,
- 3) They all are bound up with information-energetic interchange between the mother and environment and the child,
- 4) The children with these syndromes were exposed to heavy social - psychological distress together with their mothers during pregnancy (Lake 1979; Benedetti 1983; Van den Bergh a. Marcoen 2004, Beversdorf e.a.2005, Janus 2001; Mulder e.a.2002; Brekhman e.a. 2010, oth.).

What are the hypothetical pathogenesis mechanisms of these syndromes?

As we know, distress is accompanied by serious psychological and neuro-endocrine reactions; first of all, the hypothalamic-pituitary-adrenal axis (Selye1936). Modern investigations confirmed that activation of this axis during pregnancy in condition of prenatal stress accompanied unusual fetal and infant neuro-behavior (Austin *et al.*2005). Increased levels of hormones cause metabolic changes which (as a rule) affect not only mother's organism, but also the organism of the unborn child on the

various levels: systemic, organ, cellular, sub-cellular, and genetic. It can provoke the epigenetic processes, and also unusual activation or suppression of some genes and their mutations. The genetic mutations after distress during pregnancy was found in the children with autism, ADHD, depression (Beverdorf et al 2001, Kuehner 2003, Kendler *et al* 2006; Surtees et al. 2006; Miletić, Bojović 2009).

During distress the destructive information about the maternal feelings and thoughts can go to prenat and his cells by chemic-molecular mechanisms, and enrich (extend) the content of cellular memory.

From the position of wave genetics (Gariaev 1994,1997) and wave theory of information interchange between mother and her unborn child (Brekman 1998, 2001, 2005) the wave information can go to nervous and also to somatic cells and their structure elements (genes, molecules of water and protein) of various organs. During the intrauterine stage of development the cells are in active status because they are divided and developed. At this time, they are very sensitive and the information distorted by maternal emotions can accumulate in cellular memory and can break the process of development controlled by the gene program.

As a result, there is an infringement in structural development of some parts of the developing brain: for example, cerebellum, which found in some parts of brain autists, - in children with ADHD. Another result: distress brings destroyed information into the cellular memory. It influences brain cells and somatic cells as well. This is non-conscious for the person and will control his thinking and behavior in the future.

It may be hypothetical how maternal distress can cause prenatal mental trauma. After birth and during growth, these defects show themselves as an infringement of structure and function, as complex clinical syndromes (autism, ADHD, depression), others psychological and psychosomatic disorders, including language and speech disorders. It may help in the diagnosis of such syndromes as well, as these syndromes can indicate on opportunities of language and speech disorders for timely diagnostics and treatment.

The key question: why syndromes in children may be clinically different?

- 1) Received prebirth information from mother vary in the contents, intensity and duration.
- 2) Women are very different in their psychological characteristics, and their perception of information.
- 3) Women are very different in their reactions (psychic, neuro-humoral, Wave) to unusual, maybe destructive, information.
- 4) The social environment of mother and prenat is very different and their the mother-child relationship may vary.
- 5) The organs of the unborn child are at different stages of development.

The cells of the prenat's organism divide and develop; in this period they have unusual perception of information; the unborn, as a whole, is very vulnerable and sensitive. At the same time, he is open for perception of the external world, and even of ideas of the mother. (Turner *et al* 1989). During maternal distress the prenat can

receive the distorted information, which accumulate in those nervous and somatic cells, which at that moment are most sensitive. All these cause various damages in the child which and form various clinical displays after birth.

Though we discuss in this lecture only three syndromes, language and speech disorders are found also in children born immaturely (Hediger et al 2002, Reichman 2005; Jackson 2006) and/or children born from unwanted pregnancy (David et al. 1988; Matejchek et al. 1994; Sonne 2005) – that is in children who were exposed to prenatal stress. Research from universities and clinics of USA, England, Holland confirmed that prenatal stress can cause the infringement of psychomotor development of children (Maldonado-Duran *et al.*2000; Mulder *et al.*2002; Huizink *et al.*2003).

Study of the prevalence and dynamics of these conditions and disorders shows that in recent years there is a tendency to their increasing. Specific life situations often support the development of distress situations which create conditions for the emergence of genetic mutations in the mother and probably her unborn child. As recent studies show, environmental information can be inherited and can “pass trans-generationally on behavioral, neuro-anatomical and epigenetic levels” (Dias, Ressler 2013). Authors in animal experiments have shown how memories can be transferred even by sperm from father to his descendants. Hence, parents (and not just the mother) with these syndromes may contribute to the birth of people with various mental disorders and injuries and therefore to expansion of pathology in the world.

The reproduction of the subsequent generation of people, actually *systemic process*, submits to a *principle of feedback*. The progressing increase of people who have been born with mental problems, language and speech disorders promotes expansion in human society of a population of people with profound psychological qualities. Among these are mental impairment with elements of the unusual, quite often destructive; thinking and behavior which prevent training processes that create for an individual difficulty for adaptation in society; and the society receives the additional problems (including financial) for maintenance of worthy functioning.

We could consider this in an evolutionary context: accepting the idea, that the intrauterine period of development is a stage of human evolution when pre-nate is a very vulnerable to aggression from its external environment. And this environment does not assume to vary in a near future in the best way to become less aggressive and more benevolent. Hence, we could consider the prenatal and perinatal periods of development of the human as a time for primary initial prophylaxis of disorders in the new generation of people.

We urgently need to do intervene, because today, experts forecast increasing prevalence of psychological and psychosomatic syndromes. For example: on the data of World Health Organization from 6% up to 7% of the population suffer from infringement of hearing, and by 2020 the number of the people with such pathology will increase by 30% and will reach 9% of the general population in the world¹¹. Today we cannot operate just with genes and epigenetic processes in order repair the damage to

¹¹ <http://www.usharik.ru/site/index.php/sluh-app>

the genes. Therefore, we speak about preventive control of the specified disorders. The system of prophylactics could be following:

The first step could be wide dissemination of information to the population, including state and public figures, MASS-MEDIA, medical personnel:

- a) about the mental life of the child before birth; his emotional perception and actively developing and already beginning to functioning memory;
- b) about the influence of information received before birth on mentality and type of behavior of the individual in subsequent life;
- c) about prenatal and perinatal sources of the mental and psychosomatic disorders of people;
- d) about opportunities of prophylactics of prenatal mental traumas by the creation of conditions for non-acceptance of distress concerning young spouses long before and during pregnancy.
- e) Professionals should take into account maternal well being when dealing with language and speech impaired children, etc.

Conclusion.

- 1) Language and speech disorders are typically **not isolated**. They are combined with various psychological and psychosomatic syndromes in children.
- 2) On the basis of these syndromes, lays the prenatal socio-psychological distress which unborn children together with their mothers had been exposed. Like these syndromes language and speech disorders are the result of **prenatal mental trauma**.
- 3) The wide prevalence of language and speech disorders in children and the trend of them to be increasing in the world, give occasion to consider these phenomenon as feedback processes within the **context of human evolution**.
- 4) Pregnancy and labor are the stages of human evolution when language and speech disorders may spread in the human populations, and it are the stages when we could attain success in **prevention of them**.

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