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The influence of toxins in food on a little child's speech development - overview

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Summary: Environmental toxicology is a well-known theme, but not every food toxicology „common" man had to deal with. Hearing the definition of „toxicology" we think that this is an area of medicine, but do not really know what it does and to what extent. Toxicology is the study of toxins, harmful effects on the impact on the health and life of a living organism. In these times it should be erected on a pedestal of medical science.

The environment in which we live and lives is contaminated. Toxins are both in the inhaled by human air, of drinking water, food consumption, taking medication, inhaled (even by accident) the substances. There are many types of toxins. In this hearing, the importance will be those present in the food as: product additive, chemical, pesticide residues, mycotoxins, aflatoxins chloroprapanoli, amines, heavy metals, fungi, molds (manufactured improperly stored food or in bad conditions), and other xenoestrogens.

The impact of toxins on children's development, and their speech to the 36th of the month is hypothesized to be relatively large. Children up to this moment (theoretically healthy, with normal development) are not subjected to specialist diagnosis, so they do not always small problems are seriously taken into account. It happens that parents or teachers of children (nursery, kindergarten) do not notice the difficulties, there are also often aware of them. The presence of toxins in the environment parents (before becoming pregnant women), prenatally and after birth to 36 months of age has a negative impact on child development.

Keywords: toxins, neurotoxins, food, child development

Objective of the work: The work is typically a review case, part of which – research results – is a doctoral dissertation. The aim of this publication is to draw attention to the frequency and diversity of toxins in food that affect the development of the fetus and the baby during the research period up to 36 months.

Introduction

We live in pollution. That was the way it used to be, it is today. The type of pollution changes with the human reason and its consciousness. We can do more, we produce more variety. We turn simple things into complex ones – complexity needs to be mediated in the creation cycle. The contemporary world is not synonymous with a better quality of the environment in which we live and a better quality of life [1].

We will not put an equal sign on food, except for the one that is called healthy, organic, unmodified. Toxins, because they are the perpetrators of environmental pollution and ourselves, are everywhere. They are produced for the needs of people, they arise with their participation because of striving for comfort and speed of life. Completely unnecessary. We often find them too late, for example, **DDT** (dichlorodiphenyltrichloroethane – an organic chemical used as an insecticide), **thalidomide** (a drug used in pregnant women to prevent vomiting, nausea), and **freons** (compounds chemical agents used in insecticidal aerosols, as refrigerants in refrigerators, cold stores and air-conditioning, for the production of varnishes, cosmetics,

medicines, cleaning agents and others) or **polychlorinated biphenyls** (PCBs – colorless, pale yellow or dark brown synthetic fluids with a mild hydrocarbon odor, organic chemicals used in the production of dialectic fluids (used in transformers), hydraulic fluids, packaging, adhesives and plastics, as well as in food [fish rich in fats, freshwater]) and **dioxins** (organic chemical compounds resulting from the combustion of waste, plastics, firewood and improper ventilation, grilled food) when there is a serious damage to life functions and human life. Toxin is a poison, a chemical that causes disease. The poison is not a substance that is a product of metabolic transformation, but the toxin as a poisonous substance arises in the metabolic processes of living organisms, i.e. venom of spiders, snakes, plant toxins, fungi, bacteria.

For poison is considered to any substance introduced into the body, even in a small amount, which, due to their chemical and physical causes changes in the structure and function disorder of the body [2]. The result can be illness or death. The toxicity of the substance determined dose, method of administration (oral, inhalation, dermal), frequency of administration, the time after which the effects are [2] (immediate or delayed and reversible or irreversible [3]) And the extent and degree of damage.

Toxins can be poisoned, and the dynamics of symptoms can vary: from acute, sub-chronic poisoning to chronic and subchronic poisoning (they work in a very distant time, therefore it is difficult to find a causal relationship with the disease). Poisoning can be considered exogenous (toxins in the form of poisons are introduced directly into the body: oral poisoning through the respiratory tract and through the skin, eyes, rarely intravenously or muscular) and endogenous (toxins are formed as a result of improper systemic transformation, excess of accumulated substances or impaired absorption, excretion, protein binding as well as biotransformation). The main ways in which toxins get into the body are (in order): digestive system (intake), lungs (inhalation), skin (locally, percutaneously and intradermally) and other parenteral routes (other than the gastrointestinal tract) [4].

There are many causes of poisoning. It should be divided into poisons that are consciously, deliberately delivered to the body and for those whose presence is, in error. The first group are classified drugs and stimulants in any form. It should be also activate psychoactive substances, ie., ethanol, opiates, amphetamines, solvents, barbiturates, quinine, sedatives, headache tablets, thallium, zinc phosphide, town gas, ethyl alcohol. Conscious poisoning occurred during attempted suicide or criminal, which were used to arsenic, strychnine sublimate or potassium cyanide. The second group include the need to poisoning resulting from complications of treatment, ie. Abuse of the drug or allergy to a component drug overdose by the patient or physician error pharmaceutical [5].

The development of a toxic substance involves the procedure of the emerging toxicity mechanism. Initially, this substance goes to the target site, reacts with it, and the resulting cell dysfunction is given the characteristics of toxic action. Sometimes, however, the xenobiotics do not react in the first place with the target particle, but adversely affect the biological environment, causing molecular distortions, organelles, cellular or organ. It causes this disturbance in the functioning of the cell, which triggers incorrect repair mechanisms and dysfunctional adaptation to damage.

After passing a poisonous substance into the body, it is often deposited in the plasma protein, liver and kidneys, in adipose tissue or bones. Toxins with a strong effect can also overcome the blood-brain barrier, although it happens that some of the toxins can not overcome this limit [6].

It is worth mentioning the excretion of toxins, which also takes place in several ways. Toxins can be excreted in urine, faeces, exhaled air and otherwise eliminated (ie cerebrospinal fluid, milk, sweat and saliva) [7].

Toxins and child development

The blood-brain barrier is unfortunately not a protection for infants. Its insufficient maturity causes that some chemicals get into the brain very quickly and are a big threat for the youngest. Toxic substances may also enter the fetus through the placenta (viruses, e.g. rubella virus, cellular pathogens, i.e. syphilis spirits, Ig immunoglobulin) [8].

In the last several (or even several dozen) years, it has been proven that the negative, toxic effects of some substances that have an impact on the life and health of the fetus and mother. The authors of the publication Fundamentals of Toxicology say that successful completion of these days is surprisingly rare. Undesirable effects of the presence of toxins during fetal development are:

- post-implant pregnancy loss (31%),
- serious birth defects found after birth (2-3%), often increasing to 6-7% in the first year of life (after a detailed diagnosis of symptoms),
- minor congenital malformations (14%),
- low birth weight (7%),
- infant mortality before the age of 1 (1.4%),
- neurological disorders (16-17%) [9].

The conclusion from the above is that less than half of fertilization in the current circumstances of the European environment ends with the birth of a healthy newborn. Important in this connection is the awareness of the harmful effects of preparations, the substance drug. These are not limited to: **thalidomide, diethylstilbestrol** (between 194-1970 in USA used to protect at-risk pregnancy – effect of using this drug was an increase in incidence of clear cell adenocarcinoma vaginal fetus was observed by 18 tc reproductive disorders), **ethanol** (use alcohol causing the FAS or FASD – fetal syndrom alcohol), **tobacco and tobacco smoke**, **cocaine, retinoid**s (increased exposure vit. A), or **angiotensin converting enzyme** (ACE) **inhibitors and angiotensin receptor blockers** (symptoms toxin is spontaneous abortion). perinatal death, increased risk of sudden infant death syndrome (SIDS), the risk of dyslexia, psychomotor excitability, low birth weight, the delay in the maturity of the lungs; passive smoking is also a risk to the fetus) [10].

In this chapter will become important look at the impact of the toxins contained in the food, although it is necessary to mention the toxins present in the immediate vicinity of man, baby. A brief summary of the types occurring toxins and their terminology is presented in Table 1.

Table. 1. Toxic substances and their impact on influencing the development of preconception and prenatal

toxic substances	Specified types of toxins that affect fetal development
Ionizing radiation	• radioactive iodine, • healthcare (nuclear medicine, radiation therapy, diagnostic methods). • fallout;
Infections	• Cytomegalovirus (CMV, HCMV) • Parvovirus B-19 (erythema infectiosum), • syphilis, • toxoplasmosis, • virus I and II herpes simplex (Hermes simplex virus) • varicella virus. • rubella virus. • virus, Venezuelan equine encephalitis;
Maternal injury or metabolic disorder	• alcoholism, • amniocentesis in early pregnancy, • chorionic villus biopsy (before 60 days), • rheumatic disease and an inborn heart block, • diabetes, • fenyloketoruria, • virilizing tumors, • hyperthermic, • cretinism, • folic acid deficiency, • Sjögren's team;
Drugs and chemicals	• aminoglycosides, • folic acid antagonists: aminopterin, methotrexate, • angiotensin receptor antagonists: sartans, • methylene blue, • busulfan, • quinine (high dose), • chlorombucyl, • cyclophosphamide, • cytarabine, • danazol, • diethylstilbestrol, • cigarette smoke, • ergotamine, • ethanol, • flokonazol, • androgenic hormones, • angiotensin converting enzyme inhibitors: captopril, enalapril, • iodides • cocaine, • coumarin, • anticonvulsants: diphenylhydantoin, trimethadione, valproic acid, carbamazepine, • lithium, • methimazole, • misoprostol, • lead, • penicillamine, • polichrolobifenyle, • retinoids: akutan, isotretinoin, etretinate, acitretin, • organic mercury, • thalidomide, • tetracycline, • ethylene oxide, • Carbon monoxide, • toluene, • vitamin A (large doses).

Source: Own study based on Klaassen C. D., Watkins III J.B.*, Podstawy…*, s. 189.

Food toxicology

The development of man and his health, young or older, food is of great importance, which is extracted from the soil, the sea or inland waters and comes from terrestrial animals [2-4]. These animals are affected by various unpredictable forces of nature, that make in practice the behavior characteristics of raw food is not possible. Today, people are fed food component which is rarely a solid product quality. Food because it is a complex and variable mixture of substances, which visually and taste without objections, but in value (composition, nutritional value) frequently harmful to health and life of [11].

Food that reaches the homes of the people is affected by many factors. The most common among them are:

- **factors storing food** (abnormal result on the product development of **fungi, mold, bacteria**), and how to prepare products for food (**kind of pots, kitchen utensils** – are best used pots of iron or steel [stainless steel]; preparation of food in the wrong pots, eg. aluminum or copper liberates the toxins [under the influence of temperature, the ability to produce a salt]),
- factors that contribute to the food (eg. vegetable origin) – here **pesticide residues**, used in crops,
- food, the animals fed (later eaten by human population, ie. old chickens fed bread peanuts with **aflatoxins**).
- drugs supplied to animals, which are later consumed by humans (eg. **hormones, growth promoting antibiotics, reproduction**),
- poorly prepared and improperly processed meat from sick cows (bovine spongiform encephalopathy, i.e. crazy cows disease – humans are infected with prions),
- **heavy metals** that are fed farmed fish or those inhabiting chemically contaminated waters (sea catastrophes, ship fuel, etc.),
- microbiological agents – food contaminated with microorganisms,
- cured food (meat) and some drinks – have N-nitroso compounds,
- foods stored in cans and jars,
- **xenoestrogens in food**,
- **nitrates (V) and nitrates (III) in foodstuffs**,
- **amines** (type: histamine) that are found in food and cause food poisoning and food allergies,

- **chloroprapanols** – a food contaminating compound, most commonly found in soy sauces and hydrolysates of vegetable proteins [6, 8],
- **mycotoxins** (toxins, which are low-molecular chemical compounds, produced by mold fungi on improperly stored, spoiled food),
- presence of additional **chemicals in food, preservatives, including: preservatives, antioxidants** (prolonging food durability), dyes, flavors, stabilizers, emulsifiers, sweeteners (improving organoleptic properties), solvents, enzymatic preparations, clarifying and filtration substances (helping in processing),
- **minimally processed and genetically modified food**,
- **ionizing radiation** (here also the issue of ionizing radiation associated with the influx of population, eg. from Ukraine, areas at high risk, including the Yellow Waters, where the uranium mines, mined scrap radioactive; refugees carrying contaminated food, ie. Mushrooms, bacon; the people there in significant predominance of the population have problems hematologic).

According to the latest data there are no chemicals, the presence of which is not associated with health risks. All chemicals are harmful in some more, the second a lesser extent [2, 4].

The quality of food, its safety have a significant impact of pollution. Pollution call should be any material that is not intentionally added to food, but it is present after manufacturing, storage, marketing, veterinary procedures and environmental pollutants [2-5] in which food is present. Among these impurities include pests, microorganisms, toxins, chemicals or other substances that pose a threat to human health and life [12]. Here replace the common heavy metals (lead, cadmium, mercury, arsenic), mycotoxins, polycyclic aromatic hydrocarbons, N-nitroso compounds, dioxins, polychloride biphenyl.

Heavy metals are a threat to life and health of the population. Nowadays a lot written and said about mercury in regard to children. The most toxic compound is a compound of mercury methylmercury, which is cumulated in the brain tissue, and therefore may cause disorders of brain development in children. In adults can cause neurological changes [3, 6-9].

The main source of exposure are fish and fish products [13]. The most polluted toxins are salmon, trout from farms, in turn panga (a fish lockable cages, forced to reproduction – they receive an injection of gandotropiną chorionic – a hormone produced by pregnant women), tilapia (pangasius and tilapia as farmed fish treated to the action of hormones, causing an indirect effect of production of estrogen in the body of the fish, these compounds stimulate muscle growth) and fish oil (often appearing under different, marketing names, ie. eskolar,

kostropak, oilfish and rudderfish and gloss, has undigested by human waxes, after eating such fish species occurs normally food poisoning) are very dangerous (mainly for pregnancy) include for histamine [11-12].

It is important to mention about the foods of the cans, which contain nickel, zinc or lead. Storing it endangers human health, leading to metal poisoning.

Mycotoxins are naturally occurring impurities are in the group of chemical compounds belonging to the secondary metabolites of fungi. Have mutagenic, carcinogenic, teratogenic and estrogenic [12].

The most well-known mycotoxins are **aflatoxins** – fungal metabolites, the most potent carcinogens (filamentous fungi occurring in nature as heterotrophic micro-organisms [heterotrophic], produce carbohydrates, citric acid and other acids, some produce mycotoxins). Mushrooms attack plants during growth in the field (phytopathogenic fungi) – *Fusarium species* are the biggest threat (they attack fine grain cereals, maize and potatoes) [13]. Mushrooms can also grow only during the storage of seeds and seeds (saprophytic). These fungi need less moisture in the substrate than the first type (field mushrooms) [14].

The main source of human exposure are peanuts, arachidowekukurydza, pistachios, nuts and various types of products derived therefrom. Aflatoxins tend to develop in humid conditions, when there is no quick drying product, eg. Crops, therefore, are preserved basic storage conditions that lead to the development of the toxin [10-13]. Products are also semi-soft bread, which is wrapped in foil and on dried fruit. Milk, eggs, and derivatives thereof can also be infected by aflatoxins, for each animal fed on contaminated fodder, stale food (typically a human, that is. Bread, ground) will be a carrier of toxins („disease turkey X", ducks, pheasants and [15]).

Curse Tut is an example of the impact of toxins in the environment from the interior of the tomb to isolate the species aspergillosis, which led researchers to death [16].

Mycotoxin zearalenone is analogous to aflatoxin, performs the action for xenoestrogens. It occurs on corn and other cereals, in addition to bread. Usually causes reproductive failure (i. Wild) is a nuisance to farmers.

Aflatoxins can be absorbed into the body by inhalation through the respiratory system. Raids mold of this nature are found in the basement bathrooms, pools ground floors of buildings, refrigerators and gaskets for other rooms where there is a large and stable moisture [2, 10].

Nowadays it has become a popular healthy eating, drinking freshly squeezed juices or smoothies, fruit and vegetables. This demand is not exactly beneficial to human health, because not everyone is aware that it is important to store fruits and vegetables in order to preserve the

freshness, stability of the product, its quality and selection of raw material to the product [17]. Juices and all kinds of preparations of the above mentioned products can be contaminated by the mycotoxin called Patuline (PAT).

Patuline has antibacterial, antiviral, and antiparasitic, once used as an antibiotic. 60. In the twentieth century. It was found that a major threat to humans and the environment operates mainly in plants and animals. Patulin is a common saprofit, appearing in the form of a raid on a rotting, upholstered apples, pears, berries and other fruits, which is often cumulative in a lot of water. Patulin also appears in unfermented apple juices, processed fruit. This toxin is also detected in moldy tomatoes and olives. Is a preservative, added to dried fruit and juices. As a result of sulfides and carbon dioxide is degraded [15, 17].

The less known mycotoxins include **tremorgenes** (the effect of poisoning is ataxia, tremors and/or convulsions, it is found in moldy homogenized cheese, bread, walnuts, yellow cheese), ochratoxin (it is contaminated with soy, cocoa, milk, some wine and pork), fumonizins (grains of maize, sorghum, rice), citrate (occurs during the production of cheese, can be found in sake, miso, soy sauces, cereal and vegetarian or naturally fermented products [ie sausages from Italy]).

Nitrates (V) and nitrates (III) are compounds present in significant amounts in food and water. Most often they are present in vegetables and processed, ie. beets, lettuce, radish. The impact of the presence of these compounds are species and plant variety, intensity nitrate fertilization, soil type, moisture, and the climatic conditions. Preparation of nitrates (III) was confirmed in human saliva. The presence of these compounds can be fatal for infants. A large dose of these compounds in food storage and abnormal provide a powerful dose toxic to the body [13, 15].

Poisonous substance turns out to be **chloropropanol**, which are present in soy sauces and hydrolizatorach vegetable proteins. It was also shown that may be carried in packaging food and beverages, and also be in the drinking water. Chloropropanol are used in the production of the tea bags, coffee filters, absorbent liners in meat products water, as well as cellulosic casings. This material also contain fermented sausage, raw or ripening, ie. salami. Apart from that it appears in the brewing industry as the extract and aroma. In a domestic environment we obtain the substance during grilling, frying, roasting meat and cheese [4, 9].

Xenoestrogen (gr. Xeno – alien) are exogenous chemical compounds that act at the target site alter the functioning of the secretory system, by binding to estrogen receptors. These compounds are structurally similar to certain hormones interfere with the natural synthesis in the body and lead to dysfunction at the cellular metabolism of [18]. Among the compounds

nadmienionych distinguish between phytoestrogens metaloestrogeny, pesticides, alkylphenols, parabens and UV filters [11, 13, 17].

Xenoestrogens are usually identified with the cosmetics industry, but they can also be found in plastics, pesticides, exhaust gases, tobacco smoke and plants. Xenoestrogens are also found in food, polluted air, soil and water, and are used in dentistry and industrial products. In food they most often get into grape juice, blueberries, peanuts and red wine [19].

An important testosterone is the **metallester**, its composition is made up of metals, i.e. cadmium, copper, cobalt, nickel, lead, mercury, tin and others. It is found in tobacco smoke, fruits, meats, fish and seafood. The metalloesterrogen is released into the natural environment from industrial sources, ie mining, metallurgy, electroplating; it is used for the production of batteries, dyes and plastics.

In addition, it is necessary to mention phytoestrogens in **ergot**, yeast, soybeans and chickpeas, as well as red limb and alfalfa [20] – they can stimulate the work of estrogen receptors [21].

In the issue of the harmfulness of xenoestrogens, the most important are the effects on human life and health. Animals, i.e. farmed fish, wild (with endocrine disorders) are fed with these substances and then eaten by humans. The entire life cycle of an animal is associated with developmental abnormalities of this nature for humans. It was found that estrogens affect many processes occurring throughout the human body, and their effects are not limited to the sexual system. These substances affect the balance of the bone, blood, nervous and lymphatic systems [22].

An important group of food exposed to toxins is genetically modified food and minimally processed [20, 21].

Genetically modified foods (GMOs) raises more controversy than genetically modified organisms, ie. plants (cereals, vegetables, flowers, fruit trees) or animals (rodents, farm animals, birds, fish, et al.). Doubts arise from the controversy surrounding the quality and health of modified food or feed [23]. Allegations are directed towards the use of insecticides and herbicides, glyphosate herbicides on a plant or processed feed or food for animals and humans [20]. Moreover, in the process of genetic transformation occurs to introduce a gene or fragment thereof derived from the same or another species – the material is called the promoter (AGN. Promoter – organizer). Genetic engineering uses in this process bacteria (Agrobacterium tumefaciens), which occur naturally in the environment, but in contact with the plant damage the structure and damage the quality and health. It shall also apply to the polyethylene glycol PEG, which relaxes the structure of cell membranes [24]; shall also Bt toxin, which damages

the alimentary canal, and various kinds of viruses (eg. the CaMV35S – a fragment of cauliflower mosaic-virus diseases [25]), which react with the DNA product (ie. the plant) [26].

Minimally processed food is that which is retained sensory characteristics of freshness, ie. Color, odor, taste, turgor and is subjected to only mild heat treatment methods and consolidating [22]. Risks related to the health of the consumer is a way to store the food, which in practice should not exceed four days freshness. After all the food is exposed to adverse biological agents, chemical and physical, and thus the emergence of microbial contamination, i.e.. bacteria of the genus Salmonella, Clostridium, Pseudomonas or Escherichia [27].
It should be mentioned in this thread about freeganach who eat food thrown out by others in the garbage, stale food, after the expiry date, thus contaminated.

Another group of toxic compounds are **preservatives and dyes**. Among the most popular are sodium benzoate, monosodium glutamate, sodium askrobin and salicylic acid [24, 26].
Sodium benzoate is a food preservative with the E211 symbol. It is most often used for preserving fruit, vegetable preserves, vegetable salads, tomato concentrate, canned fish, fish, shrimps, carbonated beverages and margarine. It is also used in the production of toothpastes or during the prevention of corrosion in liquids for storing surgical instruments [28].

Monosodium glutamate is a harmful substance with the symbol E621. It is a component of instant soups, sauces, spices, canned fish as a taste and smell enhancer [29].

Sodium ascorbate is the chemical symbol E301, which acts as a preservative, antioxidant, thereby regulates and stabilizes the acidity and flavor characteristics of the product. It is located in unprocessed fish, molluscs and skorupakach in packaged meat products, milk powder, puszkowych fruits and vegetables, soft drinks, juices, as well as food for the children.

Salicylic acid is an organic substance, odorless and colorless, which is sparingly soluble in water, but well in alcohols. A natural source of salicylic acid are vegetables and fruits (berries most have it), herbs, spices, almonds, chestnuts and peanuts [7, 15, 20].

In addition to the above-described briefly mention should be of food additives, ie. **dyes, emulsifiers** (to allow the combination of two substances, ie. water + fat) **propellants and packaging, acids, antioxidants, acidity regulators, modified starches, raising agents, stabilizers, sustained moisture, smell and taste enhancers, thickeners, gelling improvers** [30].

In summary, the dot on the „i" chapter on toxins in food should store it, which – as it turns out – no matter for the people. Research on food safety conducted in 2001 demonstrated (research carried out in the countries of Eastern Europe before their accession to the European Union organized in the study of the integration program, a group of 1,225 consumers) that

society has no awareness of the risks arising from product packaging, which on they are eaten every day. Polish respondents found that the greatest danger due to the presence in the food prions, bacteria, biocides, hormones or GMO [31]. It is true, however, that is, what is transmitted and stored food (intermediate or finished product) is of paramount importance. Packaging of food products of animal origin in the system of modified atmosphere (MAP) requires 20-60% of CO2 and food products or products mixed at least 30% of the gas. The presence of carbon dioxide to inhibit the growth of microorganisms, but also reduces the quality of the product and contributes to the formation of toxic substances (toxins) [24]. Consequently, the package may also be the source of the formation of different substances with significant harm to human bodies, ie. Dioctyloftalany, phthalates, styrene, aluminum, mineral hydrocarbons, ethylene glycol, released during storage of [32].

Prenatal factors influence the development of speech

The awareness of modern mothers about the conditions in which a fetus should develop well is on the one hand large, but on the other very general. It has been known for the past several decades that diet, health and emotional status as well as environmental factors have a huge impact on the fetus [30-31]. Not every future mother, however, knows what can be called a good and appropriate diet or what factors (in addition to using stimulants, dyeing hair during pregnancy, painting with paint during renovations, stress) have a negative impact on the environment in which fertilization occurs, in which fetus develops and grows up as a newborn or infant [33].

Of all the organs and systems of fetal central nervous system is most sensitive to a broad spectrum of prenatal factors, because its development is from 3 weeks after fertilization until after puberty. It is the nervous system receives pathogens quickly, it accumulates in itself and does not allow for their rapid elimination.

Prenatal experiences are very important for the fetus. When they are taken from him, the fetus has great difficulty in adapting to new conditions. Despite the enormous progress of contemporary neontologii, children who are born eight weeks or more before the actual date, are exposed to high risk of many psychiatric and neurological disorders, including impaired vision and hearing, mobility, poor control of emotional, attention deficits and delay in the onset the ability to speak [34] and their understanding of [6, 30].

The low birth weight is also a threat. It has been proven that children who were born with a weight below 1500 g (the majority are children born too early) perform less well at school,

disorders resulting from school skills are diagnosed as developmental dyslexia – it is the mildest form of dysfunction with which they can struggle.

Mother's womb is the safest place for a child, which enables him – as not a comprehensive development [not all children are born healthy], it provides the conditions necessary for optimal life – protection from the negative factors of the outside world. It has also been proved that nausea and fatigue in the first 3 months of elms is a kind of protection for the embryo and the young fetus. These symptoms – according to the author of the publication *What is going on there?* – they intensify in the phase in which the fetus is most sensitive to adverse environmental influences, and especially when all its organs form. Fatigue, lethargy, and apathy suppress a woman from undertaking hard work or difficult and dangerous activities, often dangerous to the developing fetus. Morning nausea, in turn, forces a woman to use an easily digestible diet that helps her avoid toxins produced on stale or spoiled foods. Therefore, morning nausea and tiredness should be considered as a good sign, because they testify to the good placental function. The results of the research cited by Lise Eliot show that women who feel nausea, miscarriages happen much less often than those who feel perfectly well at this time [22, 27].

The period in which you plan to a child is extremely important for a woman. This preparing yourself, your body and the surroundings to change. Determinants of good and proper fertilization are mainly emotional state of a woman and a man, the environment in which they live (building, premises, furniture, the presence of fungi, mold, animals, stimulants, professional environment), diet and health (taking xenobiotics medication constant, hormones antibiotics).

Fertilization is most likely to occur with the presence of teratogens. The most sensitive period is the first three months in which the child's structure, genotype, and all its organ systems develop. Supplementation is important. Fertilization and the first weeks after are very difficult for a woman's body. The increased work of all systems requires the need for vitamins, acids, enzymes, fats necessary for optimal development. Any shortages may contribute to deficiencies and thus developmental abnormalities in the fetus, eg lack or low level of folic acid may cause a neural tube defect. Recent reports indicate that too low levels of OH25D3 also contribute to maternal and fetal anemia. Moreover, deficiencies of vitamin B12 can permanently squeeze on the brain and cognitive development of the child [34].

Malnutrition is characterized by a pregnant mother to the child's intelligence. That's how fed on throughout his life will also have an impact on the health of the child. The cells because they have the ability to memorize shortages or surpluses, the female body has a kind heart.

Thus, if the mother had problems with nutrition, the child will most likely also struggled with this problem (research shows that these are children with impaired gastric) [22,24, 30].

Nutrition, as mentioned above, is important for the development of the child and his brain. Adopted dietary reasons for pregnant women should be permanent. The woman should take on weight about 20% of her weight. Changes in this area cause numerous abnormalities, i.e. inside uterine growth impairment, placental dysfunction, development of endocrine diseases and disturbed bloodstream and respiratory system.

Currently, it is believed that almost all medications are harmful to the embryo and fetus. Some medications are long acting on the human body, so it is important that before becoming pregnant pharmaceuticals aside for a safe period of 6 months prior to (or even earlier). Among the drugs that increase the risk of taking benefits than are indicated by symbols X medications (drugs qualification system developed by the US Food and Drug Administration). This category includes drugs such as isotretionin (trade name – Accutane) – a derivative of vitamin A used for acne [35]. Antiepileptic drugs are also dangerous, because they damage the fetus and its organs. Instead of these drugs – if necessary, to protect the health and life of the mother - alternative medicines with lower harmfulness (ie, ethosuximide or benzodiazepine) are used. Among the drugs that have harmful effects should be distinguished those that have the composition of valproic acid and/or carbamazapine (found in antiepileptic drugs, but also drugs for cancer, diabetes, clinical depression, hypertension and pharmacologically treated infections) [31, 35].

Theoretically, all medicines available in a pharmacy without a prescription belong to the safe ones, but the mother should be vigilant and make the selection of what is good and what is bad, harmful. Gynecologists, obstetricians, family doctors often recommend pregnant women with analgesics and antipyretics, i.e. acetaminophen (Tylenol), because aspirin and ibuprofen cause complications in the third trimester of pregnancy (among fetuses exposed to aspirin a week before birth, more cases of intraventricular hemorrhage have been reported) in the brain], because this drug reduces blood clotting, aspirin gives the effects of reduced IQ in children under 4 years of age). Threats are also present in the first trimester, when a woman takes any of the above-mentioned drugs, because they increase the appearance of a defect in the innate abdominal wall, namely the intestinal cavity being closed when the embryo develops. [36].

Nowadays it is believed that the use of drugs diastolic, as often recommended by doctors who are pregnant in the immediate vicinity, it is very harmful. The effects are seen during pregnancy, but usually after birth, when the child's growth and development. Very popular drugs such as No-spa are commonly recommended for pregnant with their typical pregnancy

symptoms. Primipara often seems to have contractions, which are contractions get threatening the health and life of the fetus, przepowiadającymi of irregularities development or birth. The generosity of doctors is not very reflective, because not pay attention to the composition of the side effects of these drugs. In No-spa active substance is in the form of drotaverine HCl (leaflet medicament available on the www.sanofi-aventis.com.pl/produkty) which, as can be read in the description of the substances may be used only when absolutely necessary. It is antispasmodic drug, which crosses the placenta, giving the effect of fetal muscle relaxation (description drotaverine www.bazaleków.mp.pl the access of 04.03.2017 r.). It is hardly surprising, therefore, that at the present time, more and more children are diagnosed with reduced muscle tone – called children „nospowymi" [37]. This medicine still belongs to category C, but now is working on demonstrating the harmful effects on the fetus of the child [2, 35].

Part of the compounds can cause damage to the limbic system, including the hippocampus, which is responsible for the development of speech learning processes. For proper operation it is necessary to an appropriate level of estrogen hormones.

It is worth adding about current dietary or ethnic modes. The society is trying to eat organic, natural products with low fat and sugar content. However, the composition is not always suitable for a label, that is to say, not everything that has an ecological reputation is. Very often one finds a population eating soy or soya based products, i.e. soy, oyster and fish sauces. As a rule, they are served with restaurants with Chinese, Korean or Japanese cuisine. In addition, the food fix or in „5 minutes" is still common [33]. This phenomenon is caused by the lack of time to cook and celebrate meals. Semi-finished products found in micro-encapsulates, containing microcapsules with flavors, stabilizers, are a great harm to human health and life. They are primarily a source of chemical contamination, besides they contain compounds that irritate the digestive tract [38].

In addition to medicines, food and the environment, stimulants, such as alcohol, cigarettes, narcotics, caffeine, as well as aspartame and its derivatives as sweeteners, monosodium glutamate, aspartic and glutamic acids and other chemical substances (teratogens) influence the health and life of the child;: organic solvents – toluene, benzene, gases used in anesthesia, oil paints, plant-insecticides, polychlorinated biphenyls, heavy metals, radiation, ionization). The abovementioned are detailed described in the first chapter [5, 36].

Speech development and the relationship with the brain and reflexes

Behavior sterile conditions during pregnancy for the woman and her child is not possible, because we live in an infected environment, we feed detrimental to the products. As humans,

we do not have a major impact this situation, the change depends on the quality of life of all and not from individuals. It is therefore possible that during pregnancy a woman living in the house of ivory, the same healthy food products and breathed purified air. The only recipe is to avoid risks, wise decisions about products and taking selective matching environment. These determinants have an impact on brain development; and if the brain is the speech and [36].

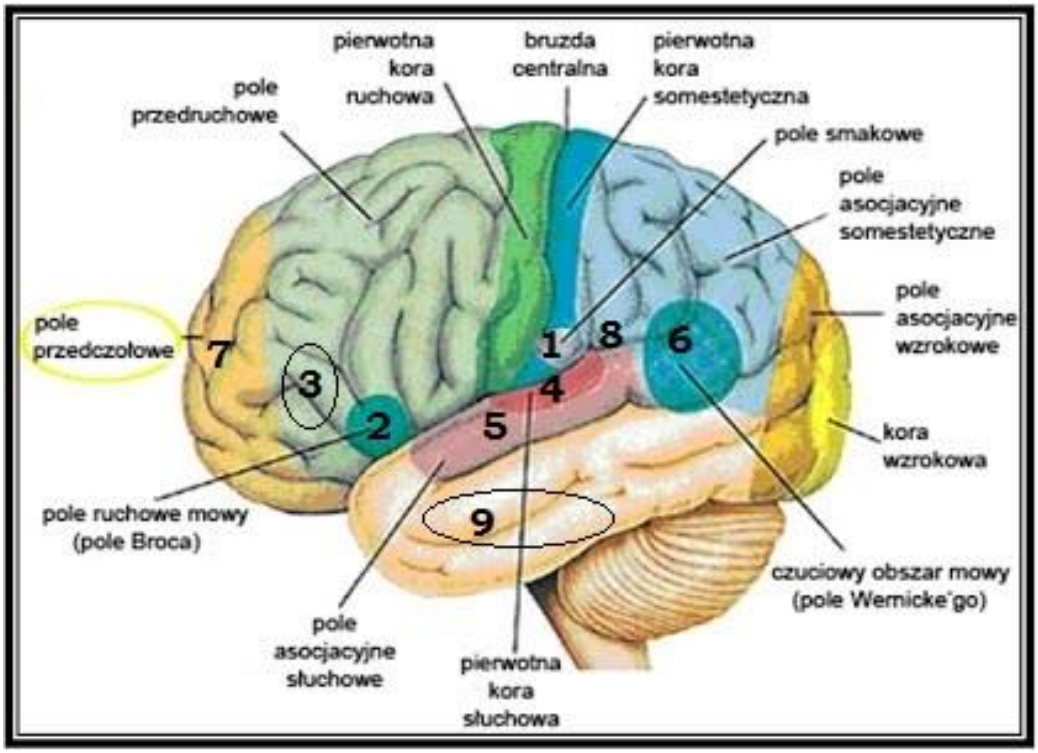
The brain is the center of the „command" of man, and all the organs and limbs – „executors" and instructions. The brain is a diversified structure which includes the brain, cerebellum, midbrain, pons, and medulla. These parts constitute an independent basis for integration międzynarządowej – meet certain functions are independent but closely cooperate [39].

Man's command center is multi-element, each of them plays an important role in development and life. For speech, it is important to operate two fields, namely Wernicke's center (Wernicke's center is the sensory center of speech, field 22 [auditory-gnostic], responsible for phonematic hearing [recognizes voices, words, sentences], it is necessary to broadcast speech) and Broca (Broca center is a speech locomotive center, field 44 according to Brodmann, this center is necessary for combining sounds into words and sentences and for formulating fluid statements, it is responsible for dynamic speech, transmits auditory information from the sensory center to the primary auditory cortex) [33, 35].

These fields take into account the relationship between individual elements of speech and movement with different parts of the brain, thus assigning them a significant degree of plasticity. Any cerebral disorder gives its outlet in developmental abnormalities. This is influenced by the following relationships: the place of the irregularity, the time (mainly the stage in the child's development), the type, range, durability of the damage and the rate of reaction preventing damage [35].

In Figure 2. the Wernicke and Brock areas in the left hemisphere of the brain were presented in relation to the transmission, interpretation and reception of speech. On the map of the brain, the number 1 place where the sounds are formed, 2 is the combination of sounds into words and sentences for which Brock's center is responsible, 3 – content side management, 4 – speech recognition (Wernicke's center), 5 – storage memory signs necessary to recognize speech and formulate statements, 6 – use of complex logic-grammatical systems, 7 – management of comprehensive aspects of speech, influence of internal and external speech on behavior, 8 – arched bunch that connects both fields and 9 – interpretation cortex.

Figure 2. Wernicky and Brock areas and speech development



Source: Own study based on S. Masgutowa, A. Regner, *Rozwój mowy dziecka w świetle integracji sensomotorycznej*, Wydawnictwo Conlinuo, Warszawa 2013, s. 79

The process of speech creation is very complex. If one mechanism is dysfunctional, the tower blocks fall apart, i.e. other organs and mechanisms start to work improperly.

For proper operation of the brain is necessary zawiadujący well and interpret the nervous system, which is closely associated with reflexes. Analyzing the words S. Masgutovwej and A. Regner, which were based on the theory of Lev Vygotsky should support the notion that speech is a higher mental function, and one of the motor function of language and articulatory apparatus. These skills enable people to build linguistic communication depending on the situation and context. Moreover, speech is a function, in which the primary motor skills and motor skills are learned and integrated thinking. Speech development can not take place earlier, until he comes to the integration of the primary motor orofacial, because this affects the development of speech and communication skills [40]. Therefore it is very important harmonious functioning and proper integration of reflexes (sucking, swallowing, saturation, biting, biting, clenching, chewing, emetic, snout [tromped] palmomental reflex Babkin, search, and determine the head with variants – visual and labyrinthine) and the reaction such as eating, emotional facial expression, visual and auditory reaction (eye opening, blinking, focusing visual and auditory, peripheral vision, hearing and one obouszne) and articulation in a natural way with babbling and issuing natural syllables.

Primary motility in the oro-facial complex is the basis of technical development, but also the mental (thinking, understanding). This means that the spontaneous motor activity exercises stimulate the maturation and integration of reflexes, hence are important for the articulation of specialization and thinking of the child.

Compatibility of muscular chain of oral-facial region

Speech develops in motion. Bearing in mind the movement should think about the active participation of organs, muscles and joints. Speech therapy practical, not based on theories, but the real action should be divided into „old" and „new". Nowadays threatening specialists, speech therapists in your practice uses the „old" speech therapy, ignoring the holistic approach pursued by the treatment. „New" neurologopedic treats the patient as a whole, based on his motor skills [39].

In the above drew attention to the integration and close cooperation between the different parts of the brain, primitive reflexes and speech development. At this point it is important to emphasize the importance of movement in the therapeutic work, including myofascial chains, which should be an integral part of working with a speech therapist.

Speech therapy is based on the human neurophysiology, so it is important to work to use the methods by which stimulates the central nervous system [41]. The occurrence of disturbances or changes in one system of the body is associated with changes in the whole system. Working with the use of therapeutic areas neuromotor is to pave the normal traffic patterns and correcting irregularities [42]. It is important to understand the role of myofascial chains that participate in the execution and implementation of traffic postural functions. Stress patterns myofascial affect the stability of the movement and the postural compensation [40].

French orthodontist and posturology Michel Clauzde proved that neurophysiological mechanism has a close relationship with oro-facial complex layout, myofascial chains have a direct impact of the central and peripheral nervous system. With this knowledge and practice not only the therapist is able to strengthen and repair the dysfunctional attitude of the patient's body to improve its impaired motor development, but also eliminate speech abnormalities associated with myofascial system. Hence it is very important to look at a holistic speech therapy, choosing appropriate targets, based on the voltage and muscle organization of the human body [40-42].

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