

## Treatment of the Child with Autism-Newest Medical Trends

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The aim of this meeting organized by Dr. Magdalena Cubala and by the Arcana Institute of Integrational Medicine of Poland, focused on today's the state-of-the-art of autism therapy and associated novel findings on research and treatments. The conference was held in the Institute of National Health of Warsaw, Poland.

Autism and Autism Spectrum Disorders (ASDs) are complex heterogeneous neuro-developmental disorders characterized by dysfunctions in social interaction and communication skills, in addition to repetitive, restrictive and stereotypic verbal and non-verbal behaviors [1].

Several international experts gave interesting keynote lectures to better cover the full spectrum of autism research and therapies. The speaker for the first key lecture was Dr. Corinne Skorupka. She is the president of the Ariane Association, the only French partner of the Autism Research Institute. She gave a detailed explanation of the role of microbial track in autism. In the latest years, there has been a very significant increase of developmental disorders, not explained simply in terms of more efficient diagnosis. Environmental factors, such as infant nutrition, air pollution and pesticides, increased exposure to electromagnetic radiation of all frequencies associated with the globalization of human communication [2], and change of human-resident microbial flora could explain the fast increase in these pathologies. Dr. Skorupka showed interesting results on the presence in the blood of most autistic children, but not in healthy children, of DNA sequences capable of emission of electromagnetic waves. Through molecular biology techniques, her research group identified that these electromagnetic waves were coming from already known bacterial species, reinforcing the hypothesis that systemic bacterial infections play a key role in the genesis of symptoms of autism. Dr. Skorupka observed that a long-term therapy consisting of successive antibiotic treatments with accompanying biomedical treatment induced a significant improvement, sometimes even a complete resolution of symptoms.

The second keynote speaker was Dr. Magdalena Cubala-Kucharska (Arcana Institute of Integrational Medicine of Poland, Medical University of Łódź, Poland), Dr. Cubala-Kucharska started with a review of medical literature linking autism to gastrointestinal issues, indicating that current research provide evidence of dysbiosis and gastrointestinal inflammation in this group of patients. Although more research is needed, gastrointestinal problems seem to play important role in autism and can either aggravate difficult behavior or, can lay at the roots of autism etiopathology. Dr. Cubala-Kucharska indicated a role of intestinal dysbiosis as a possible factor. She presented the influence of dysbacteriosis on immune system of the host, and presented mechanisms related to bacterial translocations from the gut to lymphatic tissue and liver, leading to impairment of the liver function. She further discussed the role of intestinal flora in metabolism, including mechanisms of detoxification.

Toxic implications of gut flora metabolism may include production of metabolites more toxic, carcinogenic or mutagenic than the original compound (activation), enterohepatic circulation,

differences in metabolism or toxicity of chemicals due to species strain and individual differences in gut flora, changes in patterns of metabolism due to modification of flora by diet, adaptation, drugs, age or gastrointestinal disease.

Special role in intoxication due to bacterial metabolism plays the phenomena known as enterohepatic circulation, where bowel flora is antagonizing liver metabolism by hydrolysis of bile conjugates synthesized in the liver, in order to remove from the organism, toxic substances like drugs and environmental toxins. Hydrolysis not only postpones detoxification (as the excreted substances are re-absorbed), but also allows to their further metabolism, by multiple passage through the liver. Small Intestinal Bacterial Overgrowth-colonic bacterial translocation to small intestine can be a predisposing factor.

Dr. Cubala-Kucharska proposed that the model of autism might be similar to hepatic encephalopathy, where gastrointestinal issues impaired liver detoxification, and genetic predispositions lead to internal intoxication and impairment of a brain function. This may lead to treatment of the gut as possible target in medical intervention [3].

Dr. Nicola Antonucci (Biomedical Centre for Autism Research and Treatment, Bari, Italy), the third keynote speaker, described the role of heavy metal toxicity in autism. He provided the interested audience with a review of risk factors, biomarkers and treatments. Starting from the current scientific literature, Dr. Antonucci proposed that autism could be related to metabolic encephalopathy, by accumulating heavy metals in the body tissues of the effected children. He also talked about the risk factors and possible causes of this intoxication. In addition, Dr. Antonucci discussed how to diagnose these clinical conditions, and which detoxifying and chelation treatments have been used most effectively to date with children diagnosed within the Autistic Spectrum Disorders.

Professor Kenny De Meirleir (Vrije Universiteit Brussel, Belgium) reported a very interesting talk on the novel molecule Gc protein-derived Macrophage Activating Factor (GcMaf), as a treatment modality for autism [4].

Professor Raymond Theodorus Berend Pahlplatz (Medical University Maastricht and International Biomedical Center in Leende, the Netherlands) provided a very detailed and competent discussion on the mitochondrial influence in autism. Recent data highlight the mitochondrial dysfunction in several diseases, including autism. By

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analyzing the molecular fundamentals of mitochondria, we have learnt how to regulate and influence their behavior, in order to stop their excessive production of reactive oxygen species. Relatively new substances like Pyrroloquinoline Quinone (PQQ) can strongly enhance mitochondrial function, representing a new treatment approaches for autism, but also for other neurodegenerative diseases.

Dr. Anna Rozetti, (Navicula, Lodz), presented study conducted in co-operation with Lodz Polytechnic, where levels of Homovanilic Acid were measured in urine of 52 autistic children.

Abnormal levels of HVA in urine were observed in children with autism. Function disorders of dopaminergic system can be related to such autism symptoms as behavior stereotype, mood disorders, fits of aggression and deficits in interpersonal communication, for example avoiding social interactions [5].

Dr. Dario Siniscalco (Second University of Naples, Italy) described the potential use of stem cells in treating autism. This newest potential treatment for autism is based on specific immune and neural dysregulation observed in ASDs. The stem cell self-renewal ability (the capacity to generate more identical stem cells), the capacity to give rise to more differentiated cells, and above all, the paracrine regulatory functions of stem cell (the capacity to synthesize and secrete a huge plethora of key molecules), together with immunomodulatory ability are extraordinary properties that make stem cells potential therapeutic agents for autism syndromes [6]. However, it is noteworthy to consider further investigations on stem cell biology will be needed before stem cell therapies can become a real and successful therapeutic tool for ASDs [7].

During a second day of the conference, Paulina Majkutewicz MA and Agnieszka Sulich MA (Arcana Institute of Integrational Medicine of Poland) made a review of dietary intervention in autism, including gluten free/casein free (GFCF) diet, Feingold diet and Specific Carbohydrate Diet, indicating that even if dietary intervention in autism is highly recommended, individual approach and in-depth diagnostics is necessary before implementing.

Zbigniew Burski, PhD (Hexacon LTD), lectured about health threat caused by fungal pathogens, living in the walls of moisture-damaged buildings "sick building syndrome".

People living in indoor environment infected by molds like *Cladosporium*, *Penicilium*, *Aspergillus* and *Alternaria* can get sick both

from breathing in certain airborne fungal spores, but also from toxins produced by this species.

Paweł Pflęgel MA gave a review of current state of science, regarding environmental pollution and autism.

Prof. Justyna Leszka, Dean of The High School of Integrative and Intercultural Education, hold a lecture about early signs of autism and importance of early diagnosis for proper rehabilitation and treatment.

Mr. Andrzej Borowik, Charity "Lets Stay Together" introduced Son Rise Program for parents, as an alternative for rehabilitation, especially for people living in the areas, where access to rehabilitation programs is limited.

Małgorzata Szurlej, MA (ESPACE Center) presented how Tomatis sound sensory integration stimulation can help people with learning and language difficulties, ADD and PDD.

The conference was greatly followed by much people. The audience was composed by health practitioners, medical doctors, and also by parents of autistic children.

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