

IMPACT OF NUTRACEUTICALS ON GUT-BRAIN AXIS IN CHILDREN WITH AUTISM: FOCUS ON FISH LIVER OIL AND L-CARNOSINE

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OBJECTIVE

Study the functioning of the nutraceuticals, vitamins, coenzymes, dietary changes, and phytochemicals in the management and treatment of ASD, which should have a dual effect: genetic changes, oxidative stress, and autoimmune response combined with the understanding of epigenetic processes relevant to such a neurodevelopmental disorder.

INTRODUCTION

What is Autism ?

- It is a complex neurodevelopmental condition that affects a person's ability to perceive and interact with others.
- It is characterized by difficulties in social interaction, communication, and repetitive behaviors.

What is Gut-Brain Axis ?

The bidirectional communication between the gut and brain.

Role of Nutraceuticals:-

It improves cognitive function, behavior, and gut health in children with autism, enhancing overall well-being.

LITERATURE REVIEW

01

Nutraceutical Integration in Autism Management

- Personalized approaches are essential due to ASD variability. Biomarker-guided strategies (inflammation, oxidative stress, nutritional deficiencies) complement other therapies like behavioral, pharmacological, and dietary adjustments .

02

GI Symptoms and Comorbidities in Autism

- Autistic children often experience severe GI issues like constipation linked to behavioral problems. Altered metabolism of disaccharides and increased gut permeability contribute to microbial changes and inflammation, affecting overall health and behavior.

03

Application of Fish Liver Oil and L-Carnosine in Autism

- Rich in Omega-3s (EPA, DHA), improving hyperactivity, social skills, behaviors, and reducing neuroinflammation.
- Antioxidant dipeptide improves language, social behavior, and cognition by reducing oxidative stress and protecting neurons.

FACTOR INFLUENCING THE GUT BRAIN AXIS

01

GENETIC FACTOR

1. Neuroligin and Neurexin Genes
 2. SHANK3 Gene
-

02

IMMUNOLOGICAL FACTOR

1. Gut-Associated Lymphoid Tissue(GALT)
 2. Cytokines and Inflammation
-

03

ENVIRONMENTAL FACTOR

1. Maternal Stress and Infections
 2. Antibiotic Exposure
-

NUTRACEUTICAL AND AUTISM

FISH LIVER OIL (OMEGA 3)

1. Containing EPA, DHA, Vitamin A and D.
2. Mainly has Anti-inflammatory property.
3. Helps in brain health.
4. Immune function.

L-CARNOSINE

1. A dipeptide molecule with antioxidant properties.
2. Neurological Benefits
3. Cognitive Enhancement

Impact on Autism

Autism impacts social interaction, communication, and behavior, leading to challenges in forming relationships, expressing needs, and repetitive actions. It often includes sensory sensitivities, anxiety, and gastrointestinal issues, requiring tailored therapeutic approaches.



METHODOLOGY

A systemic review on the existing literature and clinical studies, aimed at finding the answer to the efficacy of the various nutraceuticals approaches for the management of individuals with ASD, covered other fields: the roles of vitamins, coenzymes, and, to a lesser extent, dietary modifications, as well as possible phytochemicals, to lower oxidative stress and modulate immune and epigenetics responses. Data from this systematic review are presented using summarized data extractions from peer-reviewed articles, clinical trials, and meta-analyses to describe evidence for the current state of the literature.



SUGGESTIONS AND RECOMMENDATIONS

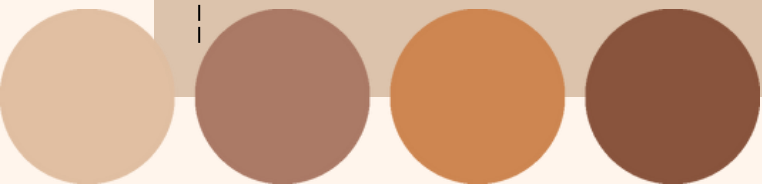
- 01 **Rigorous Clinical Trials**
- 02 **Personalized Medicine Approach**
- 03 **Combination Therapies**
- 04 **Safety and Long-Term Effects**
- 05 **Education and Awareness**

Results

- The review concluded with the identification of some vitamins (B6, B12, and D), coenzymes (CoQ10), EPA, DHA and dietary interventions (gluten-free and casein-free diets) that may have potential benefit for the management of ASD.
 - Phytochemicals, curcumin, and resveratrol further show beneficial trends in reducing oxidative stress and inflammation respectively.
 - Omega-3: Some positive effects on hyperactivity and social responsiveness, but results vary across studies.
 - L-Carnosine: More consistent positive effects on behavior, language, and socialization.
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Conclusion

- Need for Rigorous Research
- Personalized Medicine Approach
- Combination Therapies
- Longitudinal Studies
- Improving Outcomes and Quality of Life



THANK YOU

