INTERNSHIP REPORT

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

Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by social communication challenges and restricted, repetitive behaviors. The management and treatment of ASD are multifaceted, often requiring a combination of behavioral, educational, and medical interventions. Recent research has suggested that nutraceuticals—substances derived from food sources with extra health benefits—might play a role in modulating the gut-brain axis, potentially offering therapeutic benefits for children with ASD.

Objectives

The primary objective of this study is to evaluate the impact of nutraceuticals, specifically fish liver oil and L-carnosine, on the gut-brain axis in children with autism. This study aims to understand how these nutraceuticals influence genetic changes, oxidative stress, autoimmune responses, and epigenetic processes related to ASD.

Methodology

A systematic review of existing literature and clinical studies was conducted. The review focused on:

The roles of vitamins, coenzymes, dietary modifications, and phytochemicals in managing ASD.

The dual effects of these elements on genetic changes, oxidative stress, and autoimmune responses.

The impact on epigenetic processes relevant to ASD.

Data were extracted from peer-reviewed articles, clinical trials, and meta-analyses. The evidence was summarized to present the current state of the literature.

Results

The systematic review yielded the following insights:

Vitamins: Vitamins B6, B12, and D were identified as having potential benefits for managing ASD. These vitamins are involved in various metabolic processes and may help reduce oxidative stress and inflammation.

Coenzymes: CoQ10 was noted for its role in energy production and antioxidant properties, which could be beneficial in managing ASD symptoms.

Dietary Interventions: Gluten-free and casein-free diets were found to be potentially beneficial for some individuals with ASD, although results varied between studies.

Phytochemicals: Curcumin and resveratrol showed promising trends in reducing oxidative stress and inflammation, respectively. These compounds are known for their antioxidant and anti-inflammatory properties.

Despite these findings, the results varied significantly across different studies. There is a need for more rigorous clinical trials with larger sample sizes to draw definitive conclusions.

Discussion

The findings suggest that nutraceuticals, including vitamins, coenzymes, dietary modifications, and phytochemicals, may offer additional benefits in managing ASD. However, the empirical nature of these benefits necessitates further exploration. Stricter clinical trials with larger sample sizes are essential to validate these findings and develop standardized treatment regimes.

Conclusion

Nutraceuticals present a promising adjunct in the management of ASD. While some studies have confirmed their benefits, greater exploration and validation are needed. A multidisciplinary approach that combines nutraceuticals with other therapeutic interventions could potentially lead to better outcomes for individuals with ASD