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COGNITIVE REHABILITATION IN PEDIATRIC COGNITIVE DISORDERS

Neurology

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ABSTRACT

AIM: L-Carnosine is an aminoacid, acts as a neuroprotective agent. Hence we studied the role of L - Carnosine in rehabilitation of pediatric cognitive disorders.

METHODS: This is a double blind placebo controlled study done in pediatric neurology division of Govt Mohan Kumaramangalam Medical College, Salem from January 2016 to December 2017.

Children presented with cognition disorders due to autistic spectrum disorders (ASD), attention deficit hyperactivity disorder (ADHD), cerebral palsy (CP), epilepsy and dyslexia were included.

L-Carnosine is given as liquid form in the dose of 10-15mg/kg from 3-12 years of children presented with ASD, ADHD, CP, Epilepsy, and Dyslexia for 10 weeks.

Placebo children were treated with multivitamin supplement for period of 10 weeks, monitored and compared with children on L-Carnosine therapy.

Results: In this study 300 children were studied. L-Carnosine therapy (n=150), placebo therapy (n=150) male children (70%) mean age (7.1years). Female children (30%) mean age (8years) children on placebo therapy didn't so statistically significant changes in cognitive outcome. Children on L-Carnosine therapy showed statistically significant improvement in cognition in ASD ($p<0.00001$), ADHD ($p<0.00001$), CP ($p<0.0001$), Epilepsy ($P<0.00001$) and Dyslexia ($P<0.00001$). Language domains, social communications, memory, behavior, learning ability showed statistically significant improvement. Gross motor ability also showed improvement and treatment of associated co-illness with anti-psychotics, CNS Psycho stimulants gives good clinical outcome.

Conclusion: L-Carnosine acts as neuroprotector; therapy shows statistically significant improvement in cognitive function in pediatric cognitive disorders when compared with placebo therapy.

KEYWORDS

L-Carnosine therapy, cognitive disorders, functional outcome.

Introduction:

Cognition is the process of acquiring knowledge and understanding through the thought, experience and the senses. Impairment in cognition has enormous social impact due to problems in education, learning, behavior and independent living.

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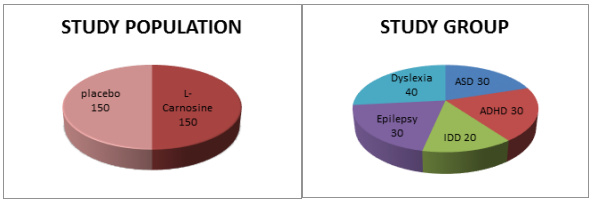

Discussion:

Cognitive process includes attention, memory, judgment and evaluation, reasoning and computations, problem solving and decision making, comprehension and production of language.

Human cognition is conscious and unconscious, concrete or abstract intuitive and conceptual. Cognitive process is obtained using existing knowledge and generating new knowledge.

Cognitive disorders maybe mild, moderate or severe. Cognitive impairment due to CNS infections, CNS toxins are preventable. Cognitive impairment in premature birth children may be avoided through proper antenatal care. Genetic studies helps in decreasing incidents of heriditory cognitive disorders.

Epilepsy patients who are on polytherapy and refractory seizure are more prone to cognitive impairments. Children with Intellectual disability disorders are having significant cognitive disability. Children with autism spectrum disorders are having significant cognitive impairment. Children with attention deficit hyperactivity disorders and dyslexia are also having cognitive impairment. We studied the role of L-Carnosine in pediatric cognitive disorders due to autism, ADHD, IDD, Dyslexia and Epilepsy.

L-Carnosine is a natural amino acid present in muscle, heart and brain tissue. Carnosine inhibits the formation of carbonyl groups thereby decreasing the production of abnormal proteins and also acts as cell membrane stabilizer and intra cellular buffer and as a neuro protective agent.

L-Carnosine has recently been shown to posses tremendous potential in rehabilitation of cognition in autistics spectrum disorders. Autistic children treated with L-Carnosine showed significant improvement in social behavior intellect, language based on childhood autism rating scale (cars), vocabulary test and biweekly parent reports.

In our study ASD children treated with L-Carnosine showed statistically significant improvement in social communication, social interaction and social behavior pattern. ADHD Children treated with L-Carnosine showed statistically significant improvement in attention, hyperactivity and impulsivity. IDD Children treated with L-Carnosine showed significant improvement in intellectual and adaptive functioning. Epilepsy children with cognitive impairment showed significant improvement in their cognitive domains. Dyslexic children showed significant improvement in their abilities.

In chez et al study the researchers reported that L-Carnosine treated children had improvement in receptive language, auditory processing, socialization, awareness of surroundings and even improvement in fine motor planning when compared with placebo group over a period of eight weeks .

L-Carnosine is a nontoxic safe substance act as neuro protector and also acts synergistically with antioxidant therapy. Chez.et.al study reports that hyperactive children's treated with high dose L-Carnosine had few side effects like irritability, insomnia and signs of over stimulation. Hence we studied with low dose L-Carnosine (10-15mg/kg) therapy over 10 weeks. No reports of adverse liver, blood, renal or nervous systems side effects with L-Carnosine therapy

Conclusion:

L-Carnosine acts as neuroprotector, therapy shows statistically significant improvement in cognitive function in pediatric cognitive disorders when compared with placebo therapy.

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