



Herbal medicines: a new hope for autism therapy

Sadegh Rezapour¹, Mahmoud Bahmani^{2*}, Omid Afsordeh², Reza Rafeian³, Ali Sheikhan¹

¹Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran

²Clinical Microbiology Research Center, Ilam University of Medical Sciences, Ilam, Iran

³Medical Plants Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran

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ABSTRACT

Autism is a neurodevelopment disorder that causes disruption in communication, behavior and social interaction, and influences all aspects of child development. Families of autistic children are involved with it more than families of children with Down syndrome and mental disorders. The causes of Autism include psychosocial, immune, genetic and biological parameters. So far there is no effective drug treatment and rehabilitation for the treatment of autism. In this study, the most important medicinal plants with neuroprotective effects on autism have been reported. Based on the present study, medicinal herbs such as *Zingiber officinale*, *Astragalus membranaceu*, *Ginkgo biloba*, *Centella asiatica*, *Acorus calamus*, *Paeonia lactiflora*, *Lobelia inflata* and *Actaea racemosa* have neuroprotective effects and might be beneficial for this problem.

Implication for health policy/practice/research/medical education:

Oxidative stress is considered as an important factor in autism. Therefore, medicinal plants with antioxidant activity might be beneficial in autism.

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Introduction

Autism disorders are developmental disorders of the nervous system that causes impairment in communication, behavior and social interaction (1). This disorder is widespread and affects all aspects of child development, so there is a need to evaluate all aspects of human performance including social skills, mobility, language, daily living skills, play, executive functions, the recognition social and academic skills (2).

Families of autistic children are involved with it more than families of children with Down syndrome and mental disorders (3). Children with autism have problems and their families, especially mothers of children with autism, suffer from the stress and the enormous psychological problems (4).

According to the statistics, incidence of autism ratio in male to female has been reported about 1: 3 to 1: 4 (5). In the first year of a child's life symptoms appear, but usually it is not detected until 2 to 3 years of age (6). Psychosocial, immune, genetic, biologic causes are considered in autism (7). So far there is no choice drug for the treatment of autism, but drugs that are used are effective on behaviors such as self-injury, neglect, aggression, repetitive and stereotyped behaviors, hyperactivity and sleep disorders. The

drugs that are recommended to be used to treat symptoms of autism include clonidine, naltrexone, lithium, drivers, mega vitamins, thyroid hormones and antidepressants, but none of them has significant effect (8,9).

Medicinal plants have been recently considered as a reliable source for preparation of new drugs for treatment of various diseases (10-12). Medicinal herbs are plants that one or some of their organs contain active ingredients and are effective in various diseases (13-17). Medicinal herbs as a medicinal source are usually available, inexpensive, and effective. They generally have fewer adverse effects than chemical drugs (18-23). Different plants have different properties and chemical compounds in plants mediate their effect on the human body (24-30). Recently medicinal plants have raised a new hope for the treatment of autism. Hence, this paper aimed to introduce these plants which have had promising effects on autism. Table 1 consists of a list of medicinal plants which have brought neuro-protective effects on autistic disorder.

Discussion

It has been estimated that the cases of autism range from more than one in 500 to one in 1000. It has been suggested that environmental toxins and pollution might contribute

*Corresponding author: Mahmoud Bahmani;
Email: Mahmood.bahmani@yahoo.com

Table 1. Medicinal plants with neuro-protective effects on autistic disorder^a

Scientific Name	Family Name	Part of Usage
<i>Zingiber officinale</i>	Zingiberaceae	Ginger root
<i>Astragalus membranaceus</i>	Fabaceae	Aerial part
<i>Ginkgo biloba</i>	Ginkgoaceae	Ginkgo leaf
<i>Centella asiatica</i>	Apiaceae	Gotu kola leaf
<i>Acorus calamus</i>	Acoraceae	Calamus root
<i>Paeonia lactiflora</i>	Paeoniaceae	Peony root
<i>Lobelia inflata</i>	Campanulaceae	Lobelia leaf
<i>Actaea racemosa</i>	Ranunculaceae	Black cohosh root

^aReferences 31-41.

critically in this disease. Immunizations, viral infections, antibiotics as well as nutrition are the other causal aspects. However, recent researches suggest the genetic ties and suggest that the disorder presents prenatal. Oxidative stress is also considered as an important factor (42). Therefore, the effects of medicinal plants in autism might be partly due to their antioxidant activities.

Authors' contributions

SR and MB prepared the first draft and RR edited it. All read and confirmed the manuscript.

Conflict of interests

The authors declared no competing interests.

Ethical considerations

Ethical issues (including plagiarism, misconduct, data fabrication, falsification, double publication or submission, redundancy) have been completely observed by the authors.

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