

## **Eat Your Broccoli: A New Discovery That Eases Symptoms in Autism Spectrum Disorders**

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The mandate "Eat Your Broccoli" is repeated countless times by parents, teachers and physicians. For some, especially finicky children, the task of consuming broccoli or any other vegetable seems like an ordeal at the dinner table. This vegetable that a child may see as their nemesis is in reality one of their greatest allies. A chemopreventive phytochemical found in cruciferous vegetables (broccoli, cauliflower etc) has been found to aid in the treatment of certain illnesses like cancer, hypertension and now Autism Spectrum Disorders [1].

Sulforaphane is the celebrated phytochemical that is produced when the enzyme myrosinase transforms glucoraphanin. It is a low toxic agent that can be consumed in food, dietary supplements or pharmaceuticals. Anecdotal reports suggest that daily doses of sulforaphane through diet can reduce the severity of socially dysfunctional behavior in those with Autism Spectrum Disorders [2].

Autism Spectrum Disorders are characterized by persistent deficits in social communication and social interaction across multiple contexts. In such individuals behaviors, interests and activities are restricted and repetitive. Approximately 1-2% of males are diagnosed with an Autism Spectrum Disorder and there has been no documented treatment or cure for those experiencing symptoms [3].

Recently a placebo controlled, randomized double-blind study was conducted on young men (n = 40) between the ages of 13 and 27 with moderate to severe Autism Spectrum Disorders. Of the 40 individuals 29 males were randomly selected to take dietary supplements containing sulforaphane, while the remaining participants received a placebo.

In addition to the sulforaphane and the inert medication, caregivers and doctors were given Aberrant Behavior Checklists, Social Responsive Scales, and Clinical Global Impression Improvement Scales. These tools for measurement assessed sociability, communication skills, sensory issues, abnormal behaviors and the ability to relate to others [2].

The results indicated that after 18 weeks of observation, 46% of the patients whose behavior was measured with the Clinical Global Impression Improvement Scale and who received the sulforaphane showed significant improvements in their social interactions. In addition, 42% of participants who were assessed with the CGI-I and received the treatment showed vast improvements in verbal communication. The data also suggest that 54% of participants who were evaluated using the CGI-I and received the treatment showed substantial reductions in abnormal behavior [4].

Most of the individuals who took the dietary supplement showed improvements after the first 4 weeks. These improvements were insignificant according to the Aberrant Behavior Checklist and Social Responsiveness Scale. The results from both assessments suggest that the treatment group and the control group showed no variance in their scores. Four weeks after the administering of sulforaphane was discontinued autism symptoms returned to pretreatment levels [5].

The study presented some considerable safety concerns with sulforaphane. Individuals within the treatment group gained more weight than participants in the control group. The pulse rates among participants who took sulforaphane were lower than those in the

control group. The increased occurrence of vomiting, aggression, abdominal pain, flatulence, irritability, constipation, diarrhea, fever and headaches were observed in the treatment group. Also, the exacerbation of seasonal allergies was reported in 12-19% of those taking sulforaphane.

Two individuals who participated in the research study and received the treatment suffered from seizures during the trial. Both of the participants in the experimental group had histories of seizures and therefore the seizures cannot be conclusively attributed to the treatment. No subjects from the control group had seizures [2].

Using three assessment scales researchers found significant improvements in patients with Autism Spectrum Disorders who took sulforaphane. However, the study was small, hasn't been repeated and the subjects were predominantly Caucasian males: 4 participants dropped out of the study before the first follow up visit. Scholars did not test participant's cognitive or adaptive functioning which is crucial when examining Autism Spectrum Disorders. Nevertheless, the study showed some promising results that beg for more extensive research. The medical field is far from declaring victory over Autism or its related disorders but from this new discovery researchers may move a step closer in the direction of a cure or life-enhancing treatment [6].

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