

## Gluten-free and casein-free diets in the treatment of autism

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### ABSTRACT

**Background:** Autism is a complex psychiatric disorder characterized by three core symptoms, i.e. impairments in social interaction, restricted patterns of behavior and impairments in communication. In the framework of the “opioid excess theory”, the disorder symptoms are compared to the behavioral effects of opiates. Based on this, a possible nutritional basis of autism has been proposed, hypothesizing that certain food proteins such as gluten and casein can be transformed to opioid peptides during digestion. These peptides might eventually be able to enter the blood stream and act upon the central nervous system. As a consequence, a diet low in such proteins has been hypothesized to ameliorate the behavioral symptoms of autistic children.

**Objective:** The scope of this review was to analyze the effects of gluten-free and casein-free (GFCF) diets on children with autism, as well as to provide information concerning additional aspects related to the GFCF diet in autism.

**Methods:** A literature search was conducted including scientific publications up until December 2013. Search results were screened for any kind of GFCF dietary intervention as well as surveys dealing with GFCF as a treatment for autism.

**Results:** A review of survey data shows that up to 25 % of parents of affected children report on current use of a GFCF diet. The majority of identified studies evaluating GFCF diet outcomes failed to meet basic methodological standards of interventional science. Comparison of study results did not show any clear-cut results, with a substantial proportion of studies failing to show any positive dietary effect. The results of more sophisticated trials were far from equivocal and the studies differed by many methodological aspects. Some variables such as information source and trial duration seemed to affect outcome.

**Conclusions:** Evidence for the effectiveness of the GFCF diet in the treatment of autism is sparse. Rigorous scientific evaluations partly failed to confirm therapeutic effects of the GFCF diet. These and other negative results related to the opioid excess theory weaken the underlying rationale for GFCF diet use. Nevertheless, more sophisticated investigations should be conducted in order to identify possible benefits and harms of such a dietary approach.

**Key words:** gluten-free and casein-free diet, opioid excess theory, autism, autistic spectrum disorder, therapeutic effects, evidence base, prevalence of use