

Popular autism diet does not demonstrate behavioral improvement

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A popular belief that specific dietary changes can improve the symptoms of children with autism was not supported by a tightly controlled University of Rochester study, which found that eliminating gluten and casein from the diets of children with autism had no impact on their behavior, sleep or bowel patterns.

The study is the most controlled diet research in [autism](#) to date. The researchers took on the difficult yet crucial task of ensuring participants received needed nutrients, as children on gluten-free, casein-free diets may eat inadequate amounts of vitamin D, calcium, iron and high quality protein. Unlike previous studies, they also controlled for other interventions, such as what type of behavioral treatments children received, to ensure all observed changes were due to dietary alterations. Past studies did not control for such factors. And although no improvements were demonstrated, the researchers acknowledged that some subgroups of children, particularly those with significant gastrointestinal (GI) symptoms, might receive some benefit from dietary changes.

"It would have been wonderful for children with autism and their families if we found that the GFCF diet could really help, but this small study didn't show significant benefits," said Susan Hyman, M.D., associate professor of Pediatrics at Golisano Children's Hospital at the University of Rochester Medical Center (URMC) and principal investigator of the study which will be presented Saturday (May 22) at the International Meeting for Autism Research in Philadelphia.

"However, the study didn't include children with significant gastrointestinal disease. It's possible those children and other specific groups might see a benefit."

In response to widespread parent-reported benefits, UPMC initiated the trial in 2003 to scientifically evaluate the effects of the gluten-free and casein-free diet, which eliminates wheat, rye, barley and milk proteins. Parent observation has played an important role in earlier treatment discoveries in children with autism, such as melatonin's benefits for sleep.

Hyman's study enrolled 22 children between 2 ½- and 5 ½-years-old. Fourteen children completed the intervention, which was planned for 18 weeks for each family. The families had to strictly adhere to a gluten-free and casein-free diet and participate in early intensive behavioral intervention throughout the study. Children were screened for iron and vitamin D deficiency, milk and wheat allergies and celiac disease. One child was excluded because of a positive test for celiac disease and one was excluded for iron deficiency. Other volunteers who were excluded were unable to adhere to the study requirements. The children's diets were carefully monitored throughout the study to make sure they were getting enough vitamin D, iron, calcium, protein and other nutrients.

After at least four weeks on the strict diet, the children were challenged with either gluten, casein, both or placebo in randomized order. They were given a snack once weekly with either 20 grams of wheat flour, 23 grams of non fat dried milk, both, or neither until every child received each snack three times. The type of snack was given in randomized order and presented so that no one observing - including the family, child, research staff and therapy team - knew what it contained. The snacks were carefully engineered to look, taste and feel the same, which was an exercise in innovative cooking. In addition, the nutrition staff worked closely with the families to make a snack that met their child's

preferences. Casein was disguised in pudding, yogurt or smoothies and gluten in banana bread, brownies, or cookies depending on the child's food preferences.

Parents, teachers and a research assistant filled out standardized surveys about the child's behavior the day before they received the snack, at two and 24 hours after the snack. (If the child's behavior wasn't usual at the scheduled snack time, the snack would be postponed until the child was back to baseline.) In addition, the parents kept a standard diary of food intake, sleep and bowel habits. Social interaction and language were evaluated through videotaped scoring of a standardized play session with a research assistant.

Following the gluten and casein snacks, study participants had no change in attention, activity, sleep or frequency or quality of bowel habits. Children demonstrated a small increase in social language and interest in interaction after the challenges with gluten or casein on the Ritvo Freeman Real Life Rating Scale; however, it did not reach statistical significance. That means because of the small difference and the small number of participants in the study, the finding may be due to chance alone.

The investigators note that this study was not designed to look at more restrictive diets or the effect of nutritional supplements on behavior. This study was designed to look at the effects of the removal of [gluten](#) and casein from the diet of children with autism (without celiac disease) and subsequent effect of challenges with these substances in a group of children getting early intensive behavioral intervention.

Hyman said, "This is really just the tip of the iceberg. There are many possible effects of diet including over- and under-nutrition, on behavior in children with ASD that need to be scientifically investigated so families can make informed decisions about the therapies they choose

for their [children](#)."

Provided by University of Rochester Medical Center

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