

OPINION, REVIEWS

Going gluten-free unlikely to help most people with autism

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26 JULY 2016

There is a misconception that gluten is exacerbating or causing the features of autism. So some parents immediately put their children on a gluten-free or casein-free diet in hopes that it will 'cure' them.

The role of gluten in the development, progress and treatment of autism is complex and under intense scrutiny. It is possible that the presence of immunoglobulin G (IgG) antigliadin antibodies, immune proteins made against a protein in wheat, indicate a subset of children who may benefit from a gluten-free diet.

Studies have shown that there are increased food antibodies (IgG antigliadin antibodies and anticasein antibodies) in a subset of children with autism who have gastrointestinal issues. Although this suggests a gut-brain interaction, we do not know the direction of this interaction: Is the brain affecting gut permeability or the reverse?

The presence of antibodies has to be shown to have a direct effect on brain function or dysfunction to have scientific significance as a causative factor. Nevertheless, this immune response may help to identify novel **biomarkers** of autism and offer new insights into the causes of some forms of autism.

Several rationales may explain the presence of antibodies to gluten and casein in some people with autism.

- In the **'leaky gut' theory**, impaired intestinal permeability allows harmful peptides, including gluten and casein, to diffuse into the body, where they create an immune response in the form of antibodies.
- Gluten may trigger an **inflammatory response in the gut** of some children that affects the central nervous system. A study found a significantly higher IgG antibody response to

casein and gluten in patients with autism than in neurotypical individuals, perhaps an indication of systemic inflammation that could include the gut.

- Altered intestinal permeability may be a secondary effect of disturbed brain function, neither causing nor contributing to the brain dysfunction.

Complex puzzle:

The exact significance of the presence of IgG antigliadin antibodies in this subset of people with autism is unclear. Nevertheless, these individuals do appear to have more gastrointestinal problems.

Most of the studies following the effectiveness of gluten-free or casein-free diets in autism have been shown to be either flawed or too small to be statistically valid. Many rely on the reports of a parent or caregiver and may be influenced by the caregiver's desire for a positive outcome.

For the 1 percent of children with autism who also have celiac disease, a gluten-free diet may have a dramatic effect on outcome. For those with nonspecific IgG antibodies to gluten, it may be helpful in alleviating symptoms, though this has not been demonstrated.

For many others, isolating other causes for gastrointestinal symptoms may be the most helpful way to resolve them. Unfortunately, parents often receive conflicting advice about dietary interventions. Although food and gastrointestinal troubles are clear issues for many individuals with autism, the science of the complex brain-gut puzzle is not.

Gluten-free traps:

There are many feeding issues in children with autism. They are often 'picky' eaters, perhaps a manifestation of restricted and **repetitive behaviors** that are a hallmark of the condition. A gluten-free diet is often low in fiber and essential nutrients, and this may only compound the problem. Recent studies on the presence of heavy metals in people on a gluten-free diet highlight possible neurological complications that need to be studied further.

A restrictive diet is also difficult to enforce — children with autism often see many different therapists and clinicians in the course of a typical school day (speech, art, movement therapy). Often, each group uses food as a reward to reinforce desired behaviors. If that reward is a cookie or cracker with gluten, it may trump efforts to keep to a gluten-free diet. Thus, parents may be seeing results that relate more to therapy than to diet.

For some children with autism, eating takes on a life of its own. A **preference for specific foods** — yellow or red, mushy or crunchy, spicy or bland — and sensory sensitivity can limit diets and create behavioral issues as well as malnutrition.

A gluten-free diet is a popular consideration for this population, but has not been demonstrated to alter the condition. It may also be extremely difficult to enforce, adding additional stress to family meals.

Microbe connection:

It has been hypothesized that changes in the gut microbiome play a role in autism. These studies are complicated by the fact that individuals with autism frequently receive antibiotics, are often on special diets, are highly dietary selective and often have repetitive dietary behaviors, all of which may **alter their microbiota**. Thus, it is difficult to establish whether the changes are a cause or consequence of autism or its treatment.

Because it is difficult to study the human gut at a molecular level, some researchers have studied the influence of the **microbiota on brain development** and function in autism on specially bred mice. These studies have established a link **between the microbiota and autism-like behaviors**, but not the underlying mechanisms. That is, it is not clear whether alterations in the gut microbiota are causing features of autism.

Some studies indicate that the serotonin system is involved in the development of gastrointestinal symptoms in autism. These studies involve mice with a genetic mutation seen in people with autism that affects gastrointestinal and serotonin function. These mice have features similar to those of some people with autism.

Although the links are currently unclear, it is possible that breakthrough autism treatments may start in the gastrointestinal tract. Researchers are studying whether gastrointestinal symptoms are a manifestation of the neurodevelopmental condition that could be a clue to its physical and biochemical development.

What is clear is the importance of correctly testing for, diagnosing and treating gastrointestinal disorders in this population. Anyone in pain or suffering from gastrointestinal distress will have difficulty focusing on mental tasks. This can have distinct repercussions on the many interventions used to treat autism.