

# Is Delusional Parasitosis a Gluten-Related Disorder?

James A. Tassano

January 2015

## Abstract

Delusional parasitosis is a syndrome in which the patient has an unshakable belief that they are infested with bugs. About 40% of the cases of delusional parasitosis have no known cause. Antipsychotics are often not effective, and can have severe side effects. Finding the cause of these cases of primary delusional parasitosis would help many patients. Cases of gluten sensitivity, once rare, are on the rise, and in many individuals is expressed solely as a neurological disorder. Gluten has recently been shown to cause hallucinations in some individuals. We hypothesize here that gluten sensitivity may be a cause of primary delusional parasitosis.

## **Delusional Parasitosis**

Medical professionals, as well as entomologists, occasionally are contacted by individuals suffering from delusional parasitosis (Hinkle 2011). These people claim they are infested with bugs, and intent on proving it, provide samples of the bugs, which are typically skin flakes, and dust and dirt, and will show you the 'bites', regardless of location. Their belief is unshakable.

Delusional parasitosis is considered to be a syndrome, rather than a single disorder. (Lepping 2007). The type of delusional parasitosis that most entomologists encounter is the 'delusional disorder', accounting for about 40% of the cases, and is commonly referred to as 'primary delusional parasitosis', defined as delusional parasitosis without a detectable cause. Secondary delusional parasitosis is associated with other mental disorders such as schizophrenia and depression, or with substance abuse or adverse drug response.

Antipsychotics are the standard treatment for primary delusional parasitosis (Lepping 2007, Freudenmann and Lepping 2009). Pimozide, developed in 1963, was the first-line therapy until around 2003, as it fell out of favor due to drug safety concerns (Lepping 2007). Lepping's paper also shows that Pimozide was only about 50% effective in terms of producing a full remission.

Physicians are switching to the atypical, or second-generation, antipsychotics, such as Olanzapine and Risperidone, for the treatment of primary delusional parasitosis (Scheinfeld 2015). Patient response to atypical antipsychotics is poor, with forty percent showing no response at all (Lepping 2007).

Lieberman et al, (2005) reports in a major study examining atypicals, that seventy-four percent of the schizophrenic patients stopped taking their medication within 18 months, due to intolerable side effects. This is similar to the situation with the original antipsychotics (van Puten 1974). Besides being less effective, the atypical antipsychotics

are also more expensive, and they appear to produce a lower quality of life than the first-generation antipsychotics (Keefe et al 2007).

We have a situation in which sufferers of primary delusional parasitosis have one treatment option, antipsychotics, which have less than a 50% chance of producing a full remission, are expensive, and have side effects that may be worse than the initial problem.

### **Gluten-Related Disorders**

Gluten is the general term for the major storage proteins, gliadin and glutenin, found in the endosperm of wheat, rye, and barley. These grains, introduced as a significant component of the human diet with the advent of agriculture, presented us with a new biochemical challenge. The ancient Greeks and Romans were aware of wheat allergy, and they knew of celiac disease, but not its cause (Gasbarrini et al 2012). Celiac disease was forgotten until 1856, when the writings of the Greek physician, Aretaeus of Cappadocia, were translated into English. It was not until 1952, that Dutch pediatrician, Willem Karel Dicke, made the connection between wheat proteins and celiac disease. The medical community mostly ignored celiac disease, seeing it as a rare condition, limited mostly to Europe, even as late as the year 2000. (Sapone et al 2012).

Celiac disease is an immune response to gluten, characterized by an erosion of the intestinal villi, which reduces nutrient absorption, and it has well over 50 clinical presentations (Farrell and Kelly 2002).

The first non-celiac gluten disorder was reported in 1981 (Catassi 2013 ), but it was not until 2010 that researchers really began to notice that some patients were showing a reaction to gluten that was neither an allergy nor an immune response, in that there was no sign of damage to the small intestine (Sapone et al 2010). These patients were sensitive to gluten, but did not have celiac disease

At the 2011 International Celiac Disease Symposium, in Oslo, researchers agreed that non-celiac sensitivity exists, and decided on a terminology (Sapone et al 2012).

“Gluten-related disorder” is the umbrella term, and it includes:

1. Celiac disease - when gluten wears down the intestinal villi, in the presence of certain genes
2. Non-celiac gluten sensitivity – gluten sensitivity without damage to the intestinal villi.

It is currently estimated that 1% of the population in the U.S. has celiac disease, whereas gluten sensitivity is thought to be six times higher (Jackson et al 2012). This estimate, however, may be well below the actual incidence (Leonard and Vasagar 2014), and 30% is a more robust estimate, based on the genetic markers (Czaja-Bulsa 2014).

## **Gluten Causes Neurological Dysfunctions**

Non-celiac gluten sensitivity is related to numerous neurological conditions. Jackson (2012) did a PubMed search and located 162 original papers, published between 1953 and 2011, associating psychiatric and neurologic complications to celiac disease or gluten sensitivity, including seizure disorders, ataxia and cerebellar degeneration, neuropathy, schizophrenia, depression, migraine, anxiety disorders, attention deficit and hyperactivity disorder, autism, multiple sclerosis, myasthenia gravis, myopathy, and white matter lesions. In some individuals, gluten sensitivity can present solely as a neurological condition (Hadjivassiliou et al 2010). And gluten sensitivity can cause hallucinations.

DeSantis (1997) published a case report of a woman showing symptoms of schizophrenia and celiac disease, with psychiatric symptoms, including auditory hallucinations. She responded significantly within a few days to a gluten-free diet, and was still symptom free one-year later.

Kraft and Westman, 2009, discuss a case of a 70 year old schizophrenic patient who had suffered from hallucinations since the age of seven. Her symptoms resolved after starting a gluten-free or low-carbohydrate, ketogenic diet.

Lindberg et. al, (2013) give a report of a patient with hallucinations that improved using a gluten-free diet and thiamine supplementation.

Genuis and Lobo (2014) presented a case report of a woman, suffering from both auditory and visual hallucinations, from childhood, who showed complete symptom resolution using a gluten-free diet.

Klinov and Syrow (2014) give a case report of a woman suffering from visual and auditory hallucinations, whose symptoms disappeared after starting a gluten-free diet.

Eaton et al (2015) discuss a 16 year old whose visual and auditory hallucinations disappeared after being on a gluten-free diet.

Both delusional parasitosis and gluten sensitivity have links to dopamine. Huber et al (2007) proposed that increased levels of extracellular dopamine can produce delusional parasitosis. Flann et al (2010) reported that three patients taking a dopamine agonist to treat their Parkinson's disease, and who also had delusional parasitosis, found their delusional parasitosis fully resolved when they stopped taking the antipsychotic, also suggesting that high dopamine levels can cause delusional parasitosis.

Gluten can cause higher dopamine levels. Hallert and Sedvall (1983) reported that after one year, celiac disease patients on a gluten-free diet experienced a significant increase in their dopamine metabolite concentrations.

## **Summary**

With the recent explosion of knowledge about the neurological problems caused by gluten, it is possible that delusional parasitosis may be yet another gluten-related disorder. We would like to encourage medical professionals to consider a gluten-free diet for their patients with delusional parasitosis.

## **References**

Catassi, C., Bai, J. C., Bonaz, B., Bouma, G., Calabrò, A., Carroccio, A., ... & Fasano, A. Non-Celiac Gluten sensitivity: the new frontier of gluten related disorders. *Nutrients*, 2013;5(10), 3839-3853.

Czaja-Bulsa, G. (2014). Non coeliac gluten sensitivity—A new disease with gluten intolerance. *Clinical Nutrition* 2014.

De Santis, A., Addolorato, G., Romito, A., Caputo, S., Giordano, A., Gambassi, G., ... & Gasbarrini, G. Schizophrenic symptoms and SPECT abnormalities in a coeliac patient: regression after a gluten - free diet. *Journal of internal medicine*, 1997;242(5), 421-423.

Eaton, W. W., Chen, L. Y., Dohan Jr, F. C., Kelly, D. L., & Cascella, N. Improvement in Psychotic Symptoms After a Gluten-Free Diet in a Boy With Complex Autoimmune Illness. *American Journal of Psychiatry*, 2015;172(3), 219-221.

Farrell, R. J., & Kelly, C. P. Celiac sprue. *New England Journal of Medicine*, 2002;346(3), 180-188.

Flann, S., Shotbolt, J., Kessel, B., Vekaria, D., Taylor, R., Bewley, A., & Pembroke, A. Three cases of delusional parasitosis caused by dopamine agonists. *Clinical and experimental dermatology*, 2010;35(7), 740-742.

Freudenmann, R. W., & Lepping, P. Delusional infestation. *Clinical microbiology reviews*, 2009;22(4), 690-732.

Gasbarrini G, Rickards O, Martínez-Labarga C, et al. Origin of celiac disease: How old are predisposing haplotypes? *World Journal of Gastroenterology* 2012;18(37):5300-5304.

Genuis, S. J., & Lobo, R. A. Gluten Sensitivity Presenting as a Neuropsychiatric Disorder. *Gastroenterology research and practice*, 2014.

Hadjivassiliou, M., Sanders, D. S., Grünewald, R. A., Woodroffe, N., Boscolo, S., & Aeschlimann, D. Gluten sensitivity: from gut to brain. *The Lancet Neurology*, 2010;9(3), 318-330.

Hallert, C., & Sedvall, G. Improvement in central monoamine metabolism in adult coeliac patients starting a gluten-free diet. *Psychological medicine*, 1983;13(02), 267-271.

Hinkle, N. C. Ekbom syndrome: A delusional condition of “bugs in the skin”. *Current psychiatry reports*, 2011;13(3), 178-186.

Huber, M., Kirchler, E., Karner, M., & Pycha, R. Delusional parasitosis and the dopamine transporter. A new insight of etiology?. *Medical hypotheses*, 2007;68(6), 1351-1358.

Jackson, J. R., Eaton, W. W., Cascella, N. G., Fasano, A., & Kelly, D. L. Neurologic and psychiatric manifestations of celiac disease and gluten sensitivity. *Psychiatric Quarterly*, 2012;83(1), 91-102.

Keefe, R. S., Bilder, R. M., Davis, S. M., Harvey, P. D., Palmer, B. W., Gold, J. M., ... & Lieberman, J. A. Neurocognitive effects of antipsychotic medications in patients with chronic schizophrenia in the CATIE Trial. *Archives of general psychiatry*, 2007;64(6), 633-647.

Klinov, V., & Syrow, L. The Case Of Migraine With Visual And Olfactory Hallucination Related To Food Allergy (P5. 205). *Neurology*, 2017;82(10 Supplement), P5-205.

Kraft, B. D., & Westman, E. C. Schizophrenia, gluten, and low-carbohydrate, ketogenic diets: a case report and review of the literature. *Nutr Metab (Lond)*, 2009;6(1), 10.

Leonard, M. M., & Vasagar, B. US perspective on gluten-related diseases. *Clinical and experimental gastroenterology*, 2014;7, 25.

Lepping, P., Russell, I., & Freudenmann, R. W. Antipsychotic treatment of primary delusional parasitosis Systematic review. *The British Journal of Psychiatry*, 2007;191(3), 198-205.

Lieberman, J. A., Stroup, T. S., McEvoy, J. P., Swartz, M. S., Rosenheck, R. A., Perkins, D. O., ... & Hsiao, J. K. Effectiveness of antipsychotic drugs in patients with chronic schizophrenia. *New England Journal of Medicine*, 2005;353(12), 1209-1223.

Lindberg, J., Marco, B., & Klas, S. A case of celiac disease with hallucinations. *Neurology: Clinical Practice*, 2013;3(5), 446-447.

Sapone, A., Lammers, K. M., Mazzarella, G., Mikhailenko, I., Carteni, M., Casolaro, V., & Fasano, A. Differential mucosal IL-17 expression in two gliadin-induced disorders: gluten sensitivity and the autoimmune enteropathy celiac disease. *International archives of allergy and immunology*, 2009;152(1), 75-80.

Sapone, A., Bai, J. C., Ciacci, C., Dolinsek, J., Green, P. H., Hadjivassiliou, M., ... & Fasano, A. Spectrum of gluten-related disorders: consensus on new nomenclature and classification. *BMC medicine*, 2012;10(1), 13.

Scheinfeld, Noah S. "Delusions of parasitosis." Available at: [emedicine.medscape.com](http://emedicine.medscape.com).  
(March 12, 2015) View in Article (Updated: Jan 5, 2015).

Van Putten, T. Why do schizophrenic patients refuse to take their drugs?. Archives of  
General Psychiatry, 1974;31(1), 67-72.