Undiagnosed Celiac Disease Linked to Unexplained Infertility

Jacquelyn Askew

Background
Celiac disease (CD) is an inherited autoimmune disorder that causes intolerance to protein called gluten. Gluten is the substance that makes dough elastic and thick. The term is used most often in reference to wheat flour, but gluten also occurs in rye, barley, and certain other cereal flours. CD causes the immune system to attack and destroy its own tissue in the small intestine. The lining of the small intestine has finger-like projections called villi. Villi help the body absorb nutrients from food, as it passes through the small intestine. Celiac disease can destroy the villi and make individuals unable to absorb nutrients or get rid of waste. Because of this, many who have this disorder are deficient in vitamin D, B12 (folate), and iron. Being deficient in folate and iron possibly makes it more difficult to conceive and studies have shown that these deficiencies may also cause birth defects.

Materials and Methods
Several studies have examined multiple groups of infertile women to see if there is a correlation between CD and infertility. A 2011 study completed at Columbia University, published in the Journal of Reproductive Medicine, looked at 188 infertile women patients within the age range of 25-39. Each woman went through a basic infertility screening to determine the reason for their infertility as well as a questionnaire on their gastrointestinal issues or symptoms. All of the patients then went through serologic screening for tissue transglutaminase (TTG IgA, ELISA) and endomysial antibodies (EMA IgA). These tests are used to identify 100% accuracy in screening for CD (Figure 3). A 2010 article published in the Scandinavian Journal of Gastroenterology summarized and reviewed several studies over a 40 year period. These studies screened two general groups of infertile and unexplained infertile women, and women with preterm or LBW deliveries.

Results
The 2011 study found that out of the 188 women screened, four were diagnosed with CD and three of those had unexplained infertility. Within a year, all of the patients diagnosed with CD conceived after being on a gluten free diet. Overall, 2.15% of the women with infertility had undiagnosed CD, and the 5.9% (3 of 51) who had unexplained infertility had CD (Figure 3). In addition, the article states within the groups of women who had general infertility 7.8%, 2.7%, 1.13%, 2.7%, and 2.5%, those women had undiagnosed CD. As well as, those who had unexplained infertility 4.1%, 8%, 2.1%, and 0.8%, these were then diagnosed with CD (Figure 2).

Abstract
Celiac disease (CD), the autoimmune disorder associated with gluten intolerance, is the allergy to gluten, the protein most commonly found in wheat. Celiac is becoming more familiar to the public, although only 1% of the population has been diagnosed. It is proposed that undiagnosed CD is a cause for why women are unable to conceive. If so, changing the patient’s diet, eliminating wheat will help them absorb more fertile. Undiagnosed individuals with celiac are most always deficient in iron and vitamin B12 among other critical nutrients as a result of villi having been destroyed and not allowing absorption of these vital nutrients. Sadly, iron and vitamin B deficiencies may make it more difficult for a woman to become pregnant, and it definitely has been linked birth defects. Once gluten is completely out of a woman’s body and her villi have grown back and healed, her body can then begin to absorb those nutrients hopefully allowing her to become more fertile and possibly become pregnant. A 2011 study found that 2.15% of infertile women tested positive for CD, and 5.9% of those who had unexplained infertility had CD. The infertile patients with celiac who then changed their diet, all conceived within one year. A related article stated a view of several studies concluding the seroprevalence percentages of infertile women with CD of 1.13-7.8%. Along with the percentages of women with unexplained infertility with CD of 0.8-8%. Overall, there is a clear correlation. Such studies show that celiac disease can occur in 1-6% or more of women with unexplained infertility giving doctors reason to test those with unexplained infertility for celiac in hope that a change in their diet will allow them to conceive.

Figure 1: An undiagnosed patient’s intestines when they consume gluten. (The Faculty of the Harvard Medical School, 2011)

Figure 2: Results from the article titled “Celiac disease and reproductive disorder” (Ozgor, B., & Selimoglu, M. A., 2010)

Figure 3: Results from the study titled “Increased prevalence of celiac disease in patients with unexplained infertility in the United States: A prospective study.” (Choi, J. M., Lebwohl, B., Wang, J., Lee, S. K., Murray, J., Sauer, M. V., & Green, P. H. R., 2011)

Conclusion
Overall, there is a correlation between infertility and celiac disease that ranges from 0.8-8%. The question now is, what is it that celiac does to the body that causes women to be infertile? The thought is the malabsorption of certain micronutrients such as iron and folate in celiac patients. Women with celiac with such deficiencies are often unable to conceive. This calls for further research in this area to determine if these deficiencies make it impossible or more difficult to conceive and why.

Relevant Applications to Biotechnology
There has been sufficient research conducted over time and worldwide and as infertility rates have increased, it is necessary that the medical community tests those with infertility, especially unexplained infertility for celiac disease. More blood tests are becoming available that are accurate in testing for celiac as compared to the common antibodies test that is only 50% accurate. Although a gluten free diet is the newest food trend, CD is something that should be taken very seriously. Being undiagnosed for a long period of time can cause great harm to the body causing a variety of other serious diseases. Further, if diagnosing CD in those who have unexplained infertility and changing their diets make them more fertile, then this diagnosis would not only lower the percentage of women who struggle with infertility but improve their overall health.

References