

When Good Antibodies Go Bad

by

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Part I – Infertility Issues

Jane sat nervously in the examination room. She had no idea what to expect. Her husband, Brian, gave her a reassuring smile and squeezed her hand. There was a knock on the door and then it opened to admit the physician.

“Hello, Jane. I’m Dr. Klein and I’ll be doing your fertility assessment today.”

“It’s nice to finally meet you Dr. Klein. This is my husband, Brian.” The two men smiled at each other and shook hands.

Dr. Klein sat down on the stool and opened up a thick file. “Jane, I’ve looked over the medical files that you had sent over to our office and I’ve examined the preliminary blood tests you had done at our office last week. I just need to ask you a few questions, and then we’ll do a quick examination to help me try to get to the cause of your fertility issues.”

“Sure, I’ll answer the best I can. Was anything missing from my medical records?” Jane asked, concerned that she had forgotten to send something the doctor would need. “We’ve been trying to get pregnant for two years and nothing has worked. We both want kids so badly, and a friend recommended you, so I hope you can help us.”

Dr. Klein smiled kindly at Jane and Brian. They were young, and there was no obvious explanation in Jane’s file for her infertility. Dr. Klein’s initial notes about Jane’s medical history and recent blood tests included the following:

- 28-year-old Caucasian female.
- Diagnosed at 14 with Irritable Bowel Syndrome (IBS).
- Diagnosed with anemia in her early 20s; current hemoglobin levels at 7 gm/dl.
- Active lifestyle until past year; used to exercise daily and run half marathons until recent joint pain hindered her.
- Broken wrist last year after a minor fall.
- No history or abnormal pelvic exams or PAP smears.
- Hormone levels (estrogen, progesterone, LH, and FSH) in normal ranges.
- Patient reports her menstrual cycles are not very regular.
- Positive for several classes of autoantibodies.

Looking up from his notes, Dr. Klein asked, “Jane, have you been able to control your IBS symptoms? Do you still have bouts of diarrhea or constipation despite a healthy diet?”

“I’ve never really been able to control the symptoms as much as I’d like,” Jane said. “It’s something I’ve just learned to live with. I’ve tried all sorts of different diets and nothing seems to help. I felt a little better on the new low carbohydrate diet that people have been talking about, but it was really hard to stick to.” She looked questioningly at her husband, silently wondering what her stomach problems could have to do with her fertility issues.

“One of the things we test your blood for are the presence of autoantibodies. Recent studies indicate that women with infertility problems may have higher levels of autoantibodies in their blood. Your test results show that you are positive for several autoantibodies at levels higher than we would expect in a healthy female.” Dr. Klein could see the obvious confusion on Jane and Brian’s faces. “Do either of you know what antibodies or autoantibodies are?”

Questions

1. Pretend you are Dr. Klein and first explain what an antibody is to Jane and Brian.
2. Relate the basic definition of an antibody to explain an autoantibody in terms Jane and Brian will be able to understand.
3. What are three examples of autoantibodies that can be detected and the diseases they are associated with?
4. Given her digestive problems and the presence of autoantibodies (indicating that her condition is autoimmune), what are some possible diseases (besides IBS) that Jane might have?

Part II – Getting the Diagnosis Right

“I don’t understand,” Jane said looking at Dr. Klein. “What does my immune system have to do with my infertility issues?”

“Infertility can unfortunately be a complication of several autoimmune diseases. Given your history of gastrointestinal issues along with the presence of several specific autoantibodies I believe you may have Celiac Disease. I would like you to see a gastroenterologist to confirm the diagnosis,” Dr. Klein explained.

Brian interrupted, “But I thought Jane has irritable bowel syndrome? Did the IBS cause the Celiac Disease?”

“No, I fear that Jane may have been misdiagnosed with IBS when all along she had Celiac Disease. The two can have similar symptoms, but there are tests that can definitively identify Celiac Disease,” Dr. Klein explained.

“If I get treated for Celiac Disease, will I be able to have a baby?” Jane asked fearfully.

Dr. Klein patted Jane’s hand, “Let’s get the test results back and make sure we understand the cause of your intestinal issues, and then we’ll concentrate on your infertility.”

“I don’t think I understand,” Jane said looking from Brian to Dr. Klein. “You explained to us what an antibody is and I thought they were good, so why would they cause disease? I don’t know how I could have gotten an autoimmune disease in the first place. I’m pretty healthy. I exercise and try to eat right. What could I have done differently?”

Questions

1. Briefly describe what Celiac Disease is.
2. How is Celiac Disease different from gluten intolerance or sensitivity?
3. What specific autoantibodies are tested for in Celiac Disease? What other diagnostic tests will be performed on Jane?
4. Suppose that Jane stopped all gluten intake before her autoantibody tests were performed. How do you think this change in diet would affect her test results and diagnosis?
5. Jane is concerned that she could have prevented herself from getting an autoimmune disease. What are some risk factors for autoimmune diseases in general? Looking at these risk factors, could Jane have done anything to prevent the development of her disease?
6. What hypotheses are often used to explain the trigger/onset of autoimmune diseases?

Part III – Gluten Free

“Jane, your test results have come back and it does appear that you have been suffering from Celiac Disease,” Dr. Michaels, Jane’s new gastroenterologist, explained.

Jane pulled out a pad of paper with some notes. “Since Dr. Klein mentioned Celiac Disease, I’ve been reading about it online. All the websites say I will have to give up gluten. I’ve looked at samples of gluten free diets and they seem really strict.”

Dr. Michaels smiled sympathetically. “Unfortunately, Jane, the only treatment for Celiac Disease is to eliminate gluten in your diet completely.”

Jane frowned. “I really like bread and pasta, so is it okay if I cheat once in a while and have some spaghetti?”

Dr. Michaels shook her head. “Jane, the autoantibodies made by your immune system will always be there and respond to very small amounts of gluten. There are more and more gluten-free products that can be found, so it’s not as hard to follow the diet as it used to be. We will put you in contact with a nutritionist who can help you plan some easy meals and give you ideas about substitutions to make in your diet.”

“Dr. Michaels, if I follow the gluten-free diet, will my fertility problems go away? Dr. Klein said we needed to figure out all of this stuff before thinking about my fertility issues, but I’m not getting any younger, and Brian and I would really like to have children,” Jane asked hopefully.

“Jane, I can’t give you any guarantees that your fertility issues will go away. Unfortunately Celiac Disease cannot be cured, it can only be controlled. Infertility can be a severe complication of untreated Celiac Disease. Hopefully Dr. Klein can give you a more definitive answer when you see him again.”

Question

1. What would be a possible diet for a person with Celiac Disease? Provide a menu for breakfast, lunch, dinner, and snacks. Ensure that proper amounts of nutrients are obtained. Compare the prices of gluten free foods to normal foods.
2. What problems could a child with undiagnosed Celiac Disease encounter as he/she grows? Why?
3. Why might Jane still have intestinal flares despite removing major sources of gluten from her diet? Why could this be dangerous?
4. What other diseases are people with Celiac Disease susceptible to? Hypothesize why a person with Celiac Disease would also be susceptible to these other diseases.
5. Do a literature search and describe why autoantibodies may be linked to infertility. (This is an emerging topic, so you probably won’t find anything in your textbook!)



Image Credit: The title block image is an immunofluorescence pattern of endomysial antibodies. Produced using serum from a patient with Celiac Disease on monkey esophagus with a FITC conjugate. By Simon Caulton, used in accordance with the Creative Commons Attribution-Share Alike 3.0 Unported license, from http://commons.wikimedia.org/wiki/File:ENDOMYSIAL_ANTIBODIES.jpg.

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