

Women
and
Autoimmune Diseases

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Abstract

Autoimmune diseases are a category of diseases in which the body attacks on itself, its organs or tissues. About 80 different types of autoimmune diseases have been discovered to date (Vojdani, Lambert). There is a huge sex disparity when it comes to autoimmune disorder between men and women, and some of the reason for that gap can be attributed to hormones (Kim, Tingen, Woodruff), (Baum, Grunberg 1991), (Walsh, Rau 2000). Another reason why there is such a difference in occurrence of these disorders is also due to sexism and bias in the medical field, and the lack of female representation in studies, trials, and research (Jahn, Bornhost, Gunther, Brand). This creates a major knowledge gap in diagnosing, treating, and potentially preventing autoimmune diseases.

Table of Contents

I. Introduction

II. Thesis

III. Methods

IV. Review of Literature

1. Autoimmune Diseases, what are they?
2. Symptoms and Diagnosis
3. Why are we getting them and what are the triggers?
4. Environmental Factors and Toxic Load
5. Women and Autoimmune Diseases
6. Sexism and Bias in the Medical Field

V. Analysis

VI. Personal Reflection

VII. Conclusion

VIII. Bibliography

I. Introduction

Autoimmune disease rates are getting higher and higher and are accountable for the top cases of death in the United States (Walsh, Rau 2000). Women are extremely more vulnerable to these disorders than men are. In this paper I will explain what are autoimmune diseases and how they are developed. I'll also discuss why women are carrying the heavier burden on these diseases than men are, both due to physiological nature, and by having bias and sexism in the medical field.

II. Thesis

Autoimmune diseases disproportionately targets women in our society. Some of the reason as to why that happens can be accounted to women's different physiological composition and also due to bias and sexism in the medical field, leaving a need in knowledge for preventing, diagnosing, and treating them.

III. Methods

The methods for doing this research was by searching my topic on the Pro Quest Database under Health and Medicine. Credo Health and Medicine was also used. Conclusions

on symptoms were taken from an auto-ethnographic book that deals with autoimmune illnesses, and how long it can take for them to be diagnosed. Many podcasts that talk about toxins in the environment, food sensitivities and how those can trigger autoimmune responses were used. A movie on the female viewpoint on Chronic Fatigue (fatigue is one of the common symptoms in autoimmune diseases) “*Restless*”, really helped understand a little more how challenging and debilitating fatigue actually is, and how long it actually takes for the medical field to diagnose chronic fatigue. Many articles were examined on sexism and bias on the medical field, and on why women are more susceptible to getting autoimmune responses leading to autoimmune diseases than men are.

IV. Review of Literature

1. Autoimmune Diseases: What they are?

Autoimmune diseases are a group of disorders that emerge when the immune system attacks on itself, its cells or specific organs. Several articles (Franz, Davidson and Ferguson 2016; Bach 2002; Vojdani and Lambert 2011; Kharrazian 2013) explain this, and give examples of some of the disorders. While some of these disorders are not fully being recognized, Franz, Davidson and Ferguson (2016) states that in the United States, there are 50 million people that have an autoimmune disorder of some sort, and that the majority of its victims are women. They also state that these diseases are the leading cause of death in the country and they rank as one of the top 10 leading causes of death (Franz, Davidson and Ferguson). Vojdani and Lambert (2011) states that there are at least eighty types of autoimmune disorders. Some of these disorders as explained by Franz, Davidson and Ferguson (2016) include Rheumatoid Arthritis, Multiple sclerosis, celiac disease, asthma, type 1 diabetes, just to name a few. According to Franz,

Davidson and Ferguson (2016), these disorders can attack the entire body, or it can attack one specific organ. The immune system protects the body from anything that is alien to the body. However, due to an outside triggering agent, when it come to autoimmune diseases, the immune system attacks its own body, creating multiple symptoms depending on what it is attacking. (Vojdani and Lambert Page 616).

2. Symptoms and Diagnosis

Diagnosing these disorders can be very hard, expensive and time consuming, especially since a lot of them have similar symptoms. Vojdani and Lambert also illustrates that these symptoms range from one type of disorder to another but it usually starts with fatigue, aching joints and muscles, inflammation, which are symptoms that are very commonly looked over and easily dismissed.

3. Why are we getting them and what are triggers

Various articles and books go over why we are getting autoimmunity, and explain the various triggers that might bring them about. In Karrizan (2013), he explains how heavy metals, certain chemicals, genetically modified foods, environmental pollutants can lead to inflammation in body, resulting in autoimmunity. Our toxic burdens, or the amount of toxins accumulated in our bodies, is too high. Because of that various disorders can develop like autism, Parkinson's and autoimmune diseases (Karrizan 2013).

Bach (2002), attributed these triggers to be also environmental factors, but included genetics, and socioeconomic factors. Environmental triggers can be pollutants, toxins and

chemicals. Genetics accounts for simply having the gene for predisposition in the family. Socioeconomics is what is most controversial. According to Bach, studies showed that in populations with lower social economic status had a lower rate of autoimmune disorders. He compared West Germany and East Germany. The population share the same genetic background, however the incidence of autoimmune disorders is higher in West Germany where it is more developed. It could be that some of these disorders are being under-diagnosed because of the lack of technologies and innovations in medicine. But it might also be another factor that seems to be missing.

In Vijdani and Lambert's article (2011), they seem to believe the same theory as Karrison and Bach, that those triggers are susceptibility of genes and genetic changes; environmental factors like diet, allergens, infections and toxins; but he adds sex hormones; and even emotions such as really stressful events. According to them, stress and emotions are most definite triggers for autoimmunity.

4. Environmental Factors and Toxic Load

Most studies seem to mention environmental factors when studying autoimmune diseases. In an interview conducted by Burnett (2015), she asked Aristo Vodai PhD, a series of questions about autoimmune disorders and neuroimmunological disorders. He stated during the interview that environmental factors have a huge role in those disorders. In one of his studies, Vojdani concluded that when Japanese men immigrated to the United States, they developed colorectal cancer. Japanese women living in Japan, tend to not develop breast cancer at such a high rate as do women in the United States, but when these women immigrated to the United

States, they developed breast cancer (Burnett). Genes do constitute a significant role in certain diseases, but environmental factors have a more direct impact in our bodies when it come to autoimmune diseases than genes do. He also illustrated how there are three main environmental factors that are directly related to autoimmunities and autism: infectious agents, toxic chemicals, and diet. Infections and inflammation have a direct link to these disorders. According to him oral infections can be associated to rheumatoid arthritis, and inflammation in the gut can result in leaky gut syndrome, which can later on lead to other chronic illnesses. Toxic chemicals in the form of BPA or bisphenol A (plastic), medicine, pesticides, herbicides, and many other toxins in the environment can stick to human tissue, becoming part of the toxic burden. When they bind to the human tissue, the body creates antibodies and attacks on itself, leading to autoimmunity (Burnett). Another of his studies conducted was able to prove that veterans of the Persian Gulf War who were exposed to chemical agents developed neuroimmunological disorder, which are autoimmune diseases that attack the nervous system. The chemical that was given to them was pyridostigmine bromide, to protect them from other chemical agents. That along with other factors as stress, poor diet, lack of sleep resulted in this so called Gulf War Syndrome (Burnett). Vojdani was able to prove this, he then testified for the US Senate, and the veterans were able to get free medical care. Other chemicals are silicone in breast implants, gasoline additives, mercury, lead, and other various toxic chemicals, that are toxic to humans but still found in everyday products (Burnett). The last component is diet. According to him, such a high percentage of people react to gluten, dairy and other foods, but when not diagnosed and removed from the diet, lead to autoimmune disorders.

In an article written by the Cornell University for Health and Medicine Week, it states that autoimmune diseases and allergies may be the result of being exposed to toxins as a fetus or newborn. According to them, low levels of lead, mercury, dioxin, nicotine, and ethanol exposure in fetus and newborn is enough to compromise the immune system for later on in life, resulting in the development of autoimmune disorders.

In Aitbali, Ba-M'hamed, Elhidar, Nafis, Soraa, and Bennis' study, they examined the effect of Glyphosate, a chemical used in Roundup Herbicide, on mice. They discovered that GBH- Glyphosate-based herbicide resulted in dysbiosis in mice. According to them, dysbiosis is the imbalance of the gut microbiota, which leads to many autoimmune diseases like rheumatoid arthritis, eczema, and type 2 diabetes. They also concluded that GBH can also lead to anxiety, as there is a connection to the gut and brain interactions, and depression. GBH is heavily sprayed in the food we eat (Aitbali, Ba-M'hamed, Elhidar, Nafis, Soraa, and Benni).

5. Women and autoimmune diseases

In an article written for the National Women's Health Report, it says that autoimmune diseases are the third most common disease in the US, and women are more susceptible to developing these diseases. They are speculating why that happens, as it is stated there is a need for more research. The difference varies by the specific disease, but according to the article, women are 2.3 times more likely to have an autoimmune disease than men are. This number is rounded out and can get very high depending on the disorder. When it comes to Lupus, it states on this article, that women are 9 times more likely to have it than are men. Why the sex disparity? According to them, it has to do with sex hormones, and also with the fact that women tend to have more of a

inflammatory immune response because of hormones like estrogen. Inflammation is how these autoimmune illnesses start in the first place. The study also mention that sometimes all it takes to let the illness flourish is an environmental trigger.

In another study by Thomas, Griffiths, Clare, Smeeth, Rooney, Hall (2010), it also found that from 1992 to 2003 accounts of death among women in England and Wales for autoimmune diseases were understated. According to them, autoimmune diseases were the main or underlying causes of death in women under 75 years of age, accounting for the 6th or 7th most frequent reason of death. They grouped all autoimmune diseases together, to really see the extent of the problem. They too, stated that more research needs to be made for future prevention and diagnosis, and to determine what are the causes of these disorders.

Baum and Grunberg illustrated in an article that women and men experience health differently due to there fundamental physiological differences. According to them, women carry the heavier burden of autoimmune diseases because of hormones and immunological patterns. Hormones like estrogen and androgens, are said to facilitate the occurrence of autoimmunity, which explains why the majority of autoimmunity occurs in women (Baum, Grunberg).

In another article, Walsh and Rau (2000) found that autoimmune diseases was the 10th leading cause of death, or underlying cause of death, in women in the United States in 1995.

6. Sexism and Bias in the medical field

In another article on gender and bias, Hamberg (2008) illustrates how important it is to eradicate bias and sexism in the medical field. According to her there are so many physiological differences between men and women. For example in their anatomies, environmental experience,

risk behaviors, the response to stressors, daily life activities, symptoms and prevention of diseases, treatment and in so many other ways. In the medical field women should be studied separately, and researched thoroughly for any possible variable outcomes. Hamberg says in this paper, that men are often times diagnosed more efficiently than women are when it comes to certain diseases. Men's symptoms are interpreted as physical, and women's as mental. Her thoughts on fixing this issue is through education in gender/sex bias in medical schools.

Men and women experience diseases differently. In this article, Kim, Tingen and Woodruff explain how women are still underrepresented in clinical trials and biomedical research. How a disease is developed, its symptoms, when a person is at more risk, how serious it is, and the possible side effects of certain medication differ between male and female. It is illustrated in the article that women who have coronary artery disease for example, tend to have different symptoms than men do. Since more research and knowledge is on men's symptoms, women are often being under-diagnosed and sent home with a potentially life threatening, not diagnosed disease.

Another article that evaluates sexism and bias in the medical field is one written by Linderman (2012). In the paper, he goes on to explain how women are being represented in the medical field. According to him, more women are becoming doctors, but in specializing jobs like urology, neurosurgery, and orthopedic surgeon, women make an average of 10% of that market. Women are also minority in leadership positions in academic medicine. Women physicians still make less than men physicians, 25-35% less. Linderman also points out that the twentieth century, female bodies were compared to males bodies, and that is why most research was done mostly on men, and explains the lack of knowledge on women's diseases.

V. Analysis

Autoimmune disease is an epidemic that is wide spread, but like many others disorders of the immune system, it is not being acknowledged like it should by the medical system and by the community. Roughly 50 million people have some sort of autoimmune disease in the United States today (American Autoimmune Related Diseases Association). The sex disparity of these category of diseases falls heavily on women, who are at least twice as likely to develop an autoimmune condition than men are (National Women's Health Report). Is a very interesting category of disorders as it also brings about many other controversial topics that needs addressing in the world today. There are so many advanced technologies making new things that were never before possible. Medicalization, which is taking normal aspects of life and and bringing them upon the medical field (Prof. Moore), is on the rise. Normal things like tiredness, stress, not being able to pay attention, are being diagnosed as disorders and then are prescribed strong and highly addictive medication to people who do not need them. There are many out there who do suffer from fatigue, anxiety and other symptoms that do need to be medicalized, but most do not. There are medicalized fixes for normal occurrences of life, like for example male impotence. Sure, if there is a cure and something can be done about it, it is a great thing. But should it be medicalized to the extent that insurances cover for Viagra, or that pharmaceuticals companies chose to only invest in what is most profitable as it is in coming out with better versions and brands of male enhancers, while there aren't birth controls and medicine for autoimmune disorders without major side effects to them? The race for profit turns what could help all, to help only the wealthy to enhance their lives, while other diseases aren't even

being diagnosed correctly for lack of incentive, like autoimmune diseases. The age of biomedicalization, which according to Clarke, Mamo, Fosket, Fishman and Shim, is taking medicalization to another level, using biotechnologies, techno scientific innovations, transplant medicine, genomization, molecular biology and so many other new and innovative medical technologies. All of this going on, while there still isn't enough research on how to diagnose these intricate autoimmune disorder, how to treat them, and why the differences in occurrence between men and women.

Another really interesting point when researching or finding out about autoimmune is that it has so much to do with lifestyle choices. Choices that are embroidered in people somehow, and so very hard to change. So many of these inflammations can be from a toxic burden overload, or our bodies reach the limit and these inflammations in the body turn into an autoimmune disease. These toxic overload can come from things that are part of daily life. For example PBA in plastic, they are in water bottles, cans, paper, storage containers, in foods we buy, basically in everything (Burnett). It is nearly impossible to stop using plastic for a day. Toxins can also come from other daily products we use like makeup, personal items like deodorants, shampoos, lotions, nail polish. Those can harbor many toxins, one of them is formaldehyde which is a known carcinogen (Swenberg, Moeller, Lu, Rager, Fry, Star 2016). Toxins are also in cleaning supplies, and even in the food we eat, like mercury found in fish, or glyphosate which is heavily sprayed in so many plants and vegetables that we consume on a daily basis (Aitbali, Ba-M'hamed, Elhidar, Nafis, Soraa, Bennis 2018) . Autoimmune diseases can also start with food sensitivities. In Celiac's Disease, for example, in which gluten cannot be consumed as it created inflammation responses in the body (Burnett 2015). Gluten is in almost everything, and it is a

staple ingredient in Americans' diet. According to Burnett, dairy and sugar can also be a major inflammation trigger for many people leading to autoimmune, but almost impossible to completely eliminate their consumption as they are present in so many dishes that are not even expected to contain in them. It becomes almost impossible to not consume those three simple ingredients that seem to be the major cause of inflammation for so many people.

The environmental triggers for autoimmune diseases is also a very important topic. Just like the human body is whatever is put in it, so is the environment, and for so long humans have polluted earth, its waters, its soil and its air. People breathe in that polluted air, drink the water, eat the plants and animals carrying that toxic load. The chemicals put on earth ends up right back into human's bodies, leading to so many other health complications, not only autoimmune diseases.

The most interesting of it all, is the role sex and gender have to play in autoimmune diseases. There is sexism in many aspects of today's society, but it is very prevalent still in the medical field. Women are still misrepresented in clinical trials, research studies and pharmaceutical trials. The male and female physiological composition is different. Health and disease are by nature different in men and women. Symptoms, causes, reactions, will be different. Women react completely different to men when having a cardiovascular issue, they experience extreme fatigue, stomach pains, jaw and neck pain, symptoms that are considered atypical from normal cardiovascular issues, because mostly men were used for research on cardiovascular diseases (Kim, Tingen, Woodruff). This results in women often being under-diagnosed or misdiagnosed, and sent home with a possible life threatening illness. With autoimmune illnesses is the same way. Most of those disorders have the same symptoms, but

very few get diagnosed, and when they do there are already other complications occurring. Since these disorders are more common in women, there isn't a high incentive in putting more research out there to understand the causes, identify the symptoms, and learn how to properly treat them without so many negative side effects. There just isn't enough studies done on them. There is a relationship to sex hormones and that is why it is more common in women, but that is about all that is known as to why women have a higher incident of these disorders than men (Kim, Tingen, Woodruff). It is just not researched enough and studied enough. The bias needs to be addressed. Perhaps with education something can be done, by making sure women are represented equally in research and trials, and hopefully more women will become interested in these topics that still need so much research and work to be done.

VI. Personal Reflection

When first researching this topic, I had no idea that some of the reason as to why women are more still more prone to developing autoimmune diseases can be cause because the medical system is not better equipped on diagnosing, treating, and preventing autoimmune, and other kinds of diseases, in women. The bias in the medical field is concerning, and life threatening when it deals with people's health. So long ago, women's body were supposed to be the image of the male's body, and that is one of the reasons why most research, trials, and study of disease and treatment was done mostly on men. We do know today that women's anatomy are completely different than men's, and diseases should be treated differently so there isn't such a big sex disparity in our society.

VII. Conclusion

Autoimmune diseases are an epidemic in our world today. Roughly 20% of the population, or 1 in 5, has one (American Autoimmune Related Disease Association). This research proves the thesis, that the sex disparity in autoimmune diseases is due partly to physical differences between the male and female body, and also because of sexism and bias in the medical system. Hormones is partly do blame, as they create an environment pro inflammatory in women's' bodies. However, the enormous gap in knowledge in treating, diagnosing, and potential prevention is due to existent gender bias in medical studies, research, medical trials, and gathering of statistics on women's diseases.

Another very controversial topic about autoimmune diseases is that the possible prevention of them, leads to major social change. There is a need for change in the way the agricultural system and food industry works today. There is a need for a change in the way people have relationships with food, and educate kids on how to eat, by feed, nourishing and healing the body with food. Lastly there is a need for change in how studies and research is being conducted in medical schools and pharmaceutical clinics. More women need to be represented in them.

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