An Overview On The Hygiene Hypothesis

Starting from very early on in our history, illnesses have been commonly associated with lack of sanitation and “too much” human interaction. Parting from the fear of getting sick, people in the twenty-first century, especially new parents, have drastically limited their families’ and own selves’ exposure to unknown and presumably dirty conditions. This is no hard task, considering that electronic devices are quickly replacing what is known as “playing outside”, but this sudden change inevitably presents the new interrogative of whether or not this is the right thing to do. Shortage of exposition to bacteria and other “bad” organisms, such as parasites, has led scientists to suggest what is known as the “Hygiene Hypothesis”. This hypothesis, as the name implies, proposes that if a child is not exposed to these harmful pathogens from early on, the maturing of their immunological system will be negatively affected. In this essay, I will discuss the origin of this theory, as well as the important role infectious agents play on overall human health, and the potential repercussions that may occur if these are not present in children’s development.

The first person to ever suggest this hypothesis was the immunologist, David. P. Strachan, who could not understand the incidence of hay fever, eczema, asthma, and other respiratory diseases. In his article “Hay Fever, Hygiene and Household Size”, he surveyed over seventeen-thousand children, starting from their first year up to the age of twenty-three, in search of symptoms related to hay fever and the other previously mentioned diseases. His methodology focused on asking these individuals (or their parents) whether or not they presented symptoms for these maladies a year prior to his questionnaire. What he found through his research was that hay fever at the age of 23 was inversely related to the amount of children in the household by the age of 11, meaning that those that were exposed, particularly by older siblings, at a young age, had a smaller chance of getting such sicknesses when they reached adulthood (Strachan, 1989). Through this, he realized there was not much of a correlation between the results and social class, and that they could be explained if the reason these were less common at an older age was due to the exposure to them in the early years of life (Strachan, 1989). In his conclusion, he attributed the improvements in lifestyle and reclining family sizes to an earlier and increasing expression of these diseases (Strachan, 1989).

To further the approval on the Hygiene Hypothesis, another study was made in Ethiopia, Africa, where approximately 7,125 children in their first five years of life—from rural and urban areas—were surveyed to analyze which of the two regions had more cases of wheezing and other respiratory symptoms related to asthma. The results showed that roughly 4.4% of the studied children in urban areas presented such symptoms, while 2%, which is less than half of the other’s percentage, in rural areas did (Dagoye, 2004). This study not only presented the differences in the amount of cases between urban and rural communities, but it also managed to trace down its causes. According to the article, the presence of animals in the children’s lives positively influenced their resistance to respiratory adversities (Dagoye, 2004). This meant that children in urban areas were more likely to get sick because of the lack of expose to other organisms in general.

When it comes to parasites, these have also proven to be beneficial when it comes to human health. In 2005, a study was done in the state of Iowa, where patients with Chron’s Disease

were treated with Trichuris suis parasites. This disease is defined as an inflammatory response in the digestive track, caused by an attack from the immune system to, usually, harmless microorganisms in the colon and intestines. Trichuris suis, on the other hand, is a macroparasite, known to be able to diminish the immunological system's reaction to certain antigens, without causing detrimental diseases in humans (Summers et al., 2005). The scientists working on this experiment thought that this parasite's properties were ideal for the treatment of Chron's Disease, and hence, decided to feed them to twenty-nine patients from ages ranging between 18-72. The studied individuals had to take 2,700 of these live parasites every three weeks, during a spawn of twenty-four weeks. As a result, it was observed that the severity of this inflammatory disease reduced significantly in almost 80% of the subjects, allowing researchers to demonstrate the benefits certain parasites possess when it comes to the human immune system's reactions (Summers et al., 2005).

Strachan's initial reasoning has been deemed as convincing and has been widely studied by scientists all around the world. The scientific explanation his study has propelled comes from the overall development of T-Cells. There are two types of T-Cells involved in this matter: TH1, which focuses on defeating intracellular maladies, and TH2, which attacks extracellular ones. It is believed that little exposure to bacteria and viruses in childhood results in less efficient TH1 cells, which are unable to work at the same strength as TH2 cells, leading to an imbalance that results in a weaker immune system and a higher risk of allergies (Yazdanbakhsh et al., 2002, p. 490). This suggestion, however, is often debated by scientists and has yet to confirmed as the true culprit of the previously mentioned illnesses.

Although there is still a lot to learn from the Hygiene Hypothesis, it is clear that the evidence supporting the benefits of "malicious" organisms is more than enough to prove the likelihood of such health phenomenon. As we've seen from various studies, the increasing rate of sicknesses in urban and more developed areas, as opposed to rural communities, comes from a lower exposure to bacteria, parasites, and other organisms. Although this hypothesis does not intend to imply that complete lack of health precautions is ideal, it does suggest that more frequent exposure to these conditions can be beneficial for the development of the immunological system, especially, but not exclusively, in children whose immunities are yet to be fully developed.

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