Published on *Ciencia Puerto Rico* (https://www.cienciapr.org)

Asthma: A Multifactorial Disease [1]

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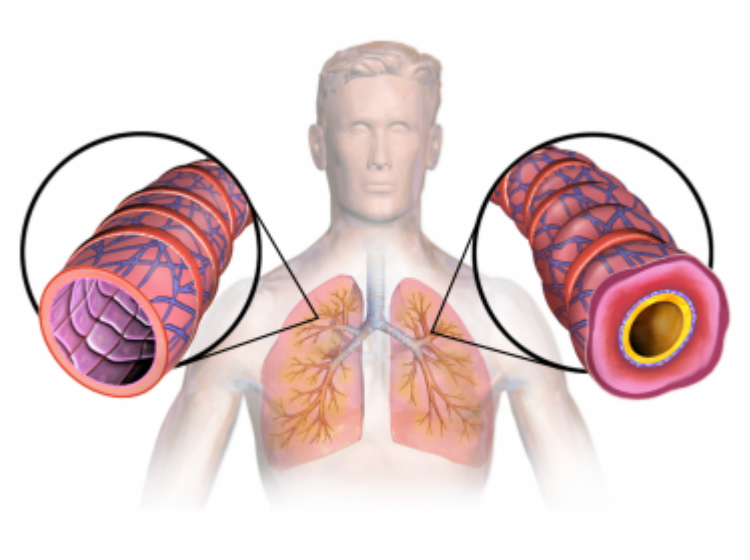

Bruce Blaus (Wikimedia Commons)

Last semester, I did an internship at the Allergy, Asthma and Immunology Clinic of the Penn State Health Milton S. Hershey Medical Center, where we specialize in treating patients with chronic respiratory disease. Soon after starting my clinical rotation, I noticed the large number of visits from Puerto Ricans, especially women. Alarmed, I decided to investigate the reasons for this trend, and I went to the library to find more information about the subject.

After reading several articles on the subject, I noticed that, compared to other groups of patients, Puerto Ricans are disproportionately affected by different chronic respiratory diseases, including asthma. According to the 2014 census, there are a total of 5.1 and 3.5 million Puerto Ricans living in the United States and Puerto Rico, respectively. The prevalence of asthmatics is higher for Puerto Ricans (16.1%) than for African-Americans (11.2%), white Americans (7.7%), or Mexicans (5.4%). In addition, the current incidence of asthma among Puerto Ricans residing in Puerto Rico (7.0%) is significantly lower than that of Puerto Ricans living in the United States (15.6%). Not only do Puerto Ricans suffer more from asthma, but their mortality rates are than for patients from other races or ethnic groups. In most of these studies, the experts suggested that these differences may be the result of genetic factors combined with greater environmental

variability or stress and gender.

Overall, the studies reported that not only there is a disparity in terms of asthmatic patient's race/ethnicity, but also that the risk of developing asthma is higher for women of reproductive age. In fact, before puberty, more boys have asthma than girls, but after puberty, more women have asthma than men. In many women, asthma attacks also vary with the phase of the menstrual cycle. This reminds me of the story of a friend, who after having a healthy childhood began to develop asthma at the age of 20. During the first year after her initial diagnosis, and with the help of inhalers she managed to control the disease. Little by little, the inhalers stopped working and the attacks started to worsen. I remember how these attacks were more frequent few days before she got her periods and disappeared a few days after. At that time, I was wondering if hormones could be influencing these sudden changes.

Now, as a graduate student, I am investigating the role of female and male hormones in lung inflammation. In my studies, I have learned that hormones can control many health issues. Unfortunately, the majority of the population is not well-informed about this relationship. Hormones are chemical compounds that function as messengers in the body and travel through the bloodstream. Hormones have many functions in the female body, from birth to puberty, and in pregnancy and menopause. Normally, hormones help the organs communicate with each other, but sometimes their levels can increase or decrease drastically causing serious health problems in people suffering from inflammatory diseases, especially asthma.

As I mentioned earlier, during childhood, more boys suffer from asthma than girls. This pattern changes after puberty, when women become more prevalent to asthma than men. It is at puberty when girls begin to produce high levels of female hormones: estrogen and progesterone, which vary during the menstrual cycle. It is estimated that about one third of women with asthma have acute symptoms days before their menstruation. In addition, studies have shown that hormonal changes can alter the respiratory tract and the inflammatory response in the lungs. The hormones that travel through the system contribute to the formation of new blood vessels in the lung, as well as the destruction of them, thus affecting the oxygenation process.

Today, many scientists are investigating how hormones affect or influence lung function and at the same time, they are following different populations and high-risk groups to observe their symptoms. This information is important not only for public health, but also to understand in depth diseases like asthma, and to be able to develop personalized treatments for these patients.

Tags:

- yale ciencia academy [3]
- Asma [4]
- asthma [5]
- health disparities [6]

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Links
[1] https://www.cienciapr.org/en/blogs/conocimiento-tu-salud/asthma-multifactorial-disease?language=en
[2] https://www.cienciapr.org/en/user/nfuentes?language=en
[3] https://www.cienciapr.org/en/tags/yale-ciencia-academy?language=en
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