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Seasonal allergy and symptoms.

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Abstract:

Seasonal allergies, often triggered by environmental factors such as pollen, significantly affect individuals' quality of life and can affect athletic performance. This review summarizes findings from four observational studies on seasonal allergies, highlighting their strengths and limitations. Komarow and Postolache (2005) examined the impact of seasonal allergies on athletic performance, noting symptoms like nasal congestion, dyspnea, and fatigue but lacking quantitative experimental data. Vigo et al. (2017) used a mobile app in the UK to collect large-scale data on allergy symptoms, revealing correlations between allergy symptoms and overall wellness, yet faced limitations in geographic and demographic diversity. McKee (2005) explored the familial occurrence of seasonal allergies, linking genetic factors with a higher prevalence of allergic symptoms, though this study was limited by geography and an adult population sample. Myszkowska et al. (2002) focused on the relationship between pollen, fungal spores, and allergy symptoms in Cracow, finding correlations with specific pollen types but limited by a small clinical sample size.

Overall, the studies confirm an association between seasonal allergies and environmental, genetic, and symptomatic factors, though causative conclusions remain unsupported. Limitations in each study, including small sample sizes, limited geographic scope, and short study durations, underline the challenges in allergy research. Future studies may benefit from integrating diverse data sources and using longitudinal designs to improve the reliability of findings on seasonal allergy causation and management.

Keywords: Seasonal allergies, aeroallergens, pollen, symptoms, genetic factors, data collection

As with other types of allergies, seasonal allergies occur when the body's immune system overreacts to something in the environment, usually in the spring, summer, or fall when certain plants are pollinating. Multiple conditions will cause seasonal allergies.

I found some articles discussing what may cause people with seasonal allergies. The first is Komarow & Postolache, Seasonal allergy, and seasonal

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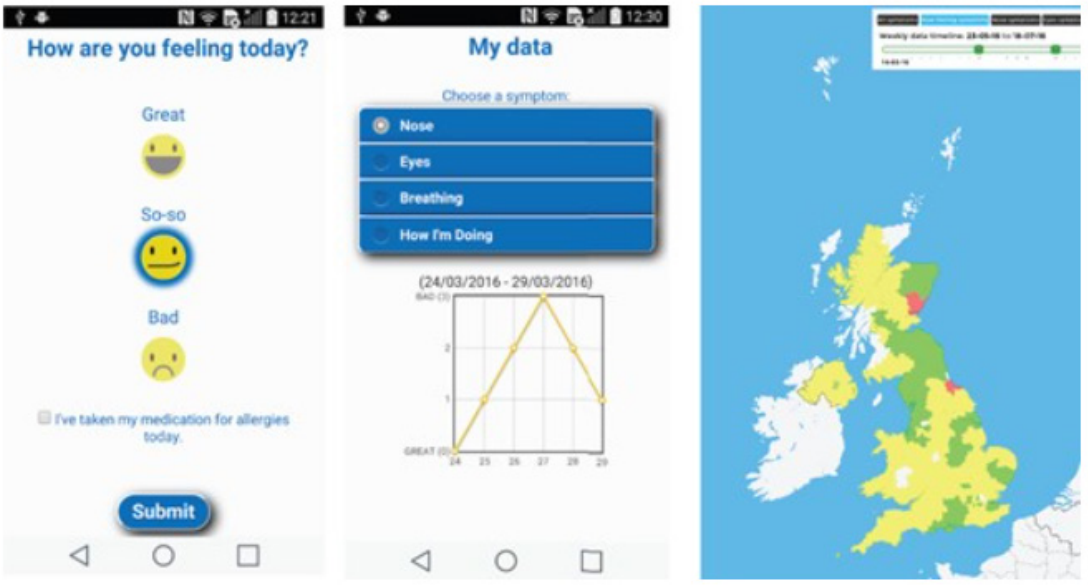
decrements in athletic performance (2005). The second one is Vigo et al., Britain breathing: Using the experience sampling method to collect the seasonal allergy symptoms of a country (2017). I will focus on the latter one as the top journal.

(Komarow & Postolache 2005) The third one is (McKee, The incidence and familial occurrence of allergy 2005), and the last one is Myszkowska et al., The relationship between airborne pollen and fungal spore concentrations and seasonal pollen allergy symptoms in Cracow in 1997–1999 – aerobiology. These four articles used observational studies and some set-controlled groups to experiment. Most articles about seasonal allergies are pretty old. So, some articles probably do not mainly talk about seasonal allergies.

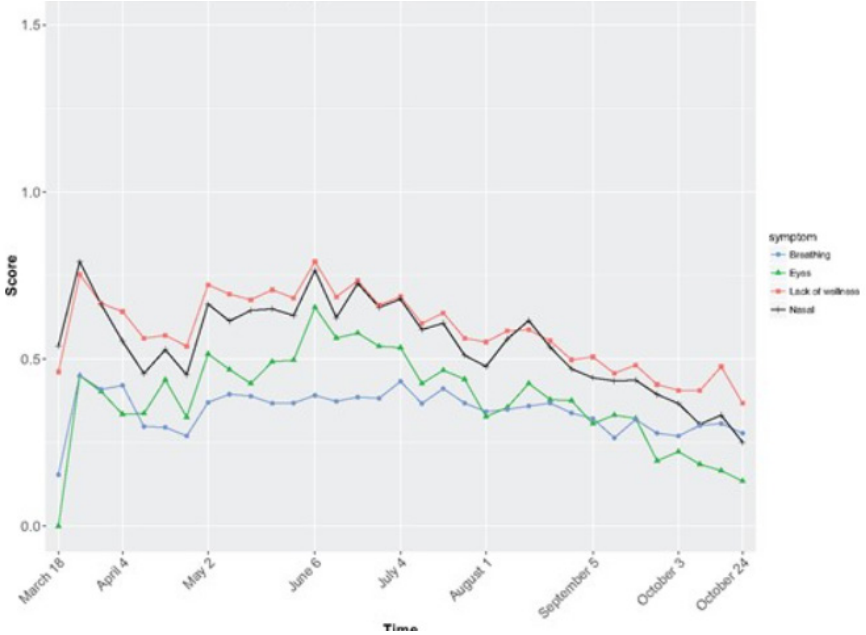
In this paper, they are studying that Due to increased ventilation during exercise, athletes can experience significant allergic symptoms triggered by exposure to aeroallergens; allergic reactions lead to nasal and conjunctival congestion, tearing, dyspnea, pruritus, fatigue, and mood changes, which can affect athletic performance. This article summarizes the impact of allergic disorders on sports and highlights the challenges of seasonal allergies on firm performance. In their paper, they use some clinical trials from previous experiments and find cases that correspond to their topic, an observational study. Based on a 15-year database of aeroallergen records and an earlier survey of allergic disease in elite athletes of Australian Olympic teams. They are trying to find different infectious diseases of seasonality. They also analyzed the relationship between ventilation and the environment. Also, they listed other signs and symptoms of allergic rhinitis in their study. The bad thing is that the author only gives us a method of knowing how seasonal allergies will affect people, but he didn't experiment. So, there is no experimental data in his paper and no data analysis or conclusions for the methodology.

The paper (Vigo et al., 2017) is the most focused. They want to ascertain whether experience sampling is reliable for collecting allergy symptom data in the general population, allowing us to map symptoms and understand etiology. They have set an experiment in which A 32-week cross-sectional study was conducted in which individuals reported their seasonal allergy symptoms and severity through a mobile application. Geographic location and timestamps of symptoms were also automatically collected. This is an observational study. They programmed an app that can let their volunteer record their feeling for the day, and also, if they are allergic, they can select which part of their body feels uncomfortable. The scale to be used (4-point scale: 0 = absent to 3 = severe). The data was collected from March 18, 2016, to October 30, 2016. They have 20278 observations on the app, and this is a general number that can make the article more convincing. They received one report from 118 of the 124 zip code areas in the UK, representing 95% of all zip code areas. The average number of words per postcode area was 167 (min=1, max=613, SD=156). For each month of the study (8 months), 43% of postal districts received at least one report; over seven months, 69% received at least one word. They compared the data with antihistamine prescription data (from the British National Formulary) to check their data validity. They calculated their r value and P value $r = 0.93$, $P < .003$. It is in a reliable range. So that they could continue to analyze their data, they used Spearman correlations to confirm that nasal symptoms had the strongest correlation with wellness. A Mann-Whitney U test: $U = 1068$, $Z = -6.7$, $P < .0001$, which suggests a relationship between drug taking and well-being. A blocked or runny nose significantly impacts well-being more than itchy or watery eyes. They get their data from ESM(delivered via a mobile device, a reliable method of collecting data about respiratory allergy symptoms within a country). They have discussed several aspects of seasonal allergies, such as geography, signs, drugs, etc. To reduce the risk of effectiveness, symptoms should not be treated as isolated variables, as they are affected by interactions of allergens with a range of triggers, including temperature and humidity, location, and time of day. Some exchanges, such as pollution and climate, may make allergens more immunogenic and stimulatory to the immune system, suggesting that we may need to include additional data sets to understand the data fully. After analysis of the graph, they also found two peaks in rhinitis symptoms in April, which may be due to tree pollen, and the second peak in June, which may be due to grass pollen, which is high at this time of year. And nasal symptoms were most closely related to well-being, while those who took medication reported feeling worse. For this paper, the author uses two models-spearman correlations and the Mann-Whitney U test to find the most vital relationship between allergy and the drug's affection. However, there are some limitations that the author didn't complete. The author only collects less than one year of data. Even though it is a massive amount of data, this article has a period limitation. They also use social media to ask people to record their symptoms and feelings. The questionnaire is an excellent way to record data, but only spreading the questionnaire from social media will let young people (no teenage or older people) fill out the form. So, there also is an age limit for this article. The drug and allergy are associated. We cannot say the drug can reduce the symptoms of allergy, which is the same as evidence of the reliability of the ESM in collecting seasonal allergy symptoms (and their severity) and the

associated timestamps and geographic coordinates.



ESM APP. The figure above shows most of the allergy symptoms in the east of England. The deeper the color, the more people have allergy symptoms.



The data above suggest that eye and nasal symptoms indicate an overall lack of wellness when reporting allergy symptoms. A blue line means breathing. The green line represents eyes. The yellow line means lack of health, and the black line means ordinary people. The Y-axis indicates people's feelings. The X-axis denotes the timeline from March to October.

The third one is (McKee, The incidence and familial occurrence of allergy 2005). This article talks about the relationship between seasonal allergies and genetic affection. They are using cases at a large clinic. They have set several forms to organize and record these cases. The first is to discover whether there is a family history that relates to seasonal allergies. The second was the symptom of seasonal allergy. The third is Family histories of patients with seasonal allergies. The study found that people with seasonal allergic rhinitis had many close relatives with the same complaint. A 19.8 percent seasonal allergy incidence was found in this survey. Only 34.3 percent of the survey population could be considered nonallergic. This essay

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used many scale charts to analyze the distribution of the different groups. And there is no model or any other data analysis in this essay. However, it has set multiple variables, each with a controlled experiment. Hence, it has concluded several conclusions. 1. people having seasonal allergic rhinitis had a high percentage of close relatives with the same complaint. In comparison, persons with seasonal allergic rhinitis and asthma had a significantly higher percentage of relatives with allergic complaints, particularly asthma.2. Seasonal allergic rhinitis patients showed both improvements and worsening of symptoms with similar frequency over some time. Most patients with seasonal allergic rhinitis and asthma improved with time. Seasonal allergic rhinitis rarely progressed to chronic asthma.3. Persons with seasonal allergies tended to develop frequent colds; a smaller percentage of them had no colds per year compared to nonallergic individuals. 4. The data suggest that in seasonally allergic patients, inherited variations from the normal in different areas of the respiratory tract (nasal mucosa or bronchial tree) may contribute to the symptomatology. However, in my opinion, not all of these conclusions are correct. Because some of the findings are only the association, not the causation relationship, in conclusion, we can only say that people with seasonal allergies have something to do with the frequency of colds and other symptoms. There are some limitations to this essay, as well. First, they only discovered the adult population recently; in every decade of life, the incidence should be higher than ill surveys of children or college students. Second, there is a geography limitation. Because the volunteers are all from the clinic, we won't know precisely whether the patient's area will cause the seasonal allergy. Third, 26 percent of the patients with pollinosis listed their symptoms as slight; some similar individuals may have been omitted from other studies.

The last one is (Myszkowska et al., The relationship between airborne pollen and fungal spore concentrations and seasonal pollen allergy symptoms in Cracow in 1997–1999 - aerobiology) they are trying to find the relationship between airborne pollen and seasonal allergy symptoms. This essay used both observational studies and clinical studies. First, they used Aerobiological monitoring in Cracow from 1997 to 1999. The second they are performed on 40 patients in the hospital. Their primary purpose is to find different pollen relationships between fungal spores and airborne pollen. For seasonal pollen, they discovered that Tariq et al. (1996) suggested that Alternaria alternata and Cladosporium spores are the third cause of asthma symptoms, eczema, and rhinitis after house dust mites and grass pollen. During the experiment, they used a Histogram to show the difference between each variable. The main variables in his article are season, year, and plant types. They made these conclusions: 1. Pollen and fungal spore concentrations varied over consecutive years 2. The occurrence and high concentrations of pollen and fungal spores were observed during similar periods in consecutive seasons 3. A unique relationship between increased concentrations of the tree, grass, and herbaceous pollen and increased allergy symptom scores was documented 4. Patients with additional allergies to tree pollen began experiencing symptoms in mid-March. Those with other positive reactions to herbaceous pollen (excluding grasses) started to experience symptoms in mid-September.5 In 11% of patients, allergy to Alternaria spores was diagnosed based on increased symptoms in July and August, positive skin prick tests, and increased levels of specific IgE.6 Despite high concentrations of Cladosporium spores in the air, no study group showed symptoms of allergy to Cladosporium spores. There are some limitations regarding time and quantities. They only dedicated 1997 to 1999, which is a bit limited period. The most critical restriction is the quantity of their clinical studies. They only have 40 cases for their experiment. It is a minimal quantity for investigation. So their result won't be so reliable and convincing. Compared with Aerobiological studies, clinical cases are too small to validate. However, their clinical cases have a detailed record of each protein reaction when they have allergy symptoms. For example, the skin prick test shows the signs corresponding to different proteins. This is also a unique method compared with the other three articles.

Conclusion:

When searching for seasonal allergies, they do not seem as famous as in previous years. It is really to find a recent article discussing seasonal allergies. Also, these four articles didn't use any logistic regression or seasonal allergy models. The possible reason is that seasonal allergies have too many variables that probably do not fit the model. A folding line chart and histogram are the more obvious ways to show the result. For seasonal allergies, the most common methods to study are observational studies and clinical experiments. In my opinion, the conditions of seasonal allergies are associations. We cannot say they are causations.

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