

Nasobronchial Allergies And Asthma Among International Students In Tbilisi

Areeba Hasan¹, Felcia Reji¹

¹Faculty of Medicine, Tbilisi State Medical University
Tbilisi, Georgia



Abstract—Allergies and asthma are a growing cause of concern in the present day and this could be attributed to the rise in urbanization and industrialization. The study was conducted as an experiment to observe the prevalence of nasobronchial allergies and asthma in Tbilisi, considering the fact that this subject is not well explored in the region. The research involved conducting a cross-sectional survey among 162 international university students of Tbilisi. It aimed to gather information concerning the common allergens, symptoms, treatment, and preventive measures for the said diseases. It was also of interest to determine the impact of Covid-19 and its effects on pre-existing allergies and asthma.

26.5% (n=43) of participants suffered from allergic rhinitis or bronchial asthma. 87.9% (n=29) participants with allergic rhinitis were females and 12.1% (n=4) were males while among participants with bronchial asthma 50% (n=5) were male and 50% (n=5) were female (p=0.009). The study demonstrated increased trends of the diseases among the younger participants as well as among the female participants. Awareness and a better understanding of allergy testing and other treatment options need to be introduced to the population to combat the underdiagnosis of these diseases and improve the overall quality of life.

Keywords—Nasobronchial allergy; allergic rhinitis; allergens; bronchial asthma; Covid-19; survey

I. BACKGROUND

Allergic diseases are one of the most common chronic disorders in the world. Allergic rhinitis and asthma are clinical entities observed over time as separate diseases, with coinciding epidemiology of prevalence, health care costs, and quality of life [1]. Airway allergy is now understood to be a disease not limited to a specific organ but instead is a disorder of the whole respiratory tract [2]. Extensive research has gone on to suggest a link between rhinitis and asthma leading to a definition of allergic rhinobronchitis or united airways diseases (UAD). Both are inflammatory disorders with similar pathophysiology and treatment approaches [1][2].

Allergens are considered to be one of the multiple causes and triggers of nasobronchial allergy and bronchial asthma [3][4]. The particles mostly responsible for allergic symptoms are pollen, fungal spores, pest debris, household dust mite, animal dander, chemical compounds, and food [3]. Asthma is classically thought of as a disease that begins in youth however it can become clinically apparent at any age. Risk factors for adult-onset asthma are history of prematurity, early lung infections, rhinitis, smoking, and obesity [5].

Research on the prevalence of nasobronchial allergies and asthma was mainly conducted in western regions of Georgia amongst children and adolescents. However, not many studies were conducted on the prevalence of these conditions among international university students in Tbilisi. Therefore the study aims to eliminate this discrepancy.

II. MATERIALS AND METHODS

The cross-sectional survey was conducted online and was circulated with the help of representatives of various universities in Tbilisi. A pilot study was conducted on 5 participants, the results of which were used to revise and improve the survey. Data was collected using google forms for 2 weeks. The survey required an email log-in to ensure that responses are limited to one per person. Informed consent was obtained from the participants before they could proceed with the survey with the reassurance of maintaining their anonymity throughout the study. The 5-minute survey consisted of questions concerning socio-demographic information, common symptoms, aggravating and relieving factors, the influence of Covid-19 on their condition and treatment, and preventive measures.

Data was collected and analyzed using Microsoft Excel 2019 and the chi-square test was completed on quantpsy.org.

III. RESULTS

Among the 162 participants, the majority belonged to South Asian ethnicity comprising 84% (n=136), followed by people of Arab ethnicity at 5.6% (n=9) and East Asian ethnicity at 4.3% (n=7). The majority of the participants belonged to the age group of 18 to 21 years and 28% (n=33) suffer from allergies or asthma. Meanwhile, those suffering from allergies or asthma belonging to the age group 22 to 25 years were at 22.5% (n=9). 66% (n=107) of participants were female while 34% (n=55) were male. Most participants have been living in Tbilisi for a period of 1 to 3 years which includes 53.7% (n=87) of the total, followed by 17.9% (n=29) staying for 3 to 5 years and 14.8% (n=24) staying for 6 to 12 months. Those that reported having allergic rhinitis included 20.4% (n=33), whereas those that reported having bronchial asthma included 6.2% (n=10) of the participants. An overwhelming majority of 73.4% (n=119) reported their nasobronchial conditions to be of other causes.

A majority of participants experiencing allergic rhinitis belonged to the age group of 18 to 21 years. 51.5% (n=17) participants have been living in Tbilisi for 1 to 3 years while 18.2% (n=6) have been living in Tbilisi for 3 to 5 years and 6 to 12 months each. The main symptoms described were sneezing, runny nose, and nose block. 81.8% (n=27) stated that they had not taken any tests to determine their allergen while 18.2% (n=6) stated that they had allergy tests done. 60.6% (n=20) listed their allergen as dust, 18.2% (n=6) listed it as pollen, 6.1% (n=2) listed it as perfumes and fragrances, 3% (n=1) listed it as animal dander while another 3% (n=1) listed it as tobacco and smoke. 9.1% (n=3) stated that they did not know their allergen.

54.5% (n=18) participants came into contact with their allergen occasionally whereas 21.2% (n=7) were in contact with their allergens frequently. 57.6% (n=19) of participants required a large dose of allergen to trigger a response while 42.4% (n=14) experienced allergies even upon contact with small amounts of allergen. Most participants experienced their allergies every 2 weeks while a slightly smaller proportion experienced it every 6 to 12 months. The majority of the participants experienced allergies in June, July and August.

Most participants with bronchial asthma were of ages 18 to 21 and 80% (n=8) have been residing in Tbilisi for 1 to 3 years. The main symptoms described included airway irritation, dyspnea, and wheezing. 50% (n=5) of the participants had an age of onset of 5 to 10 years, 20% (n=2) at 0 to 5 years, and another 20% at 10 to 15 years of age. 80% (n=8) of participants reported having moderate severity of attacks. As shown in fig.1, the majority of participants had asthma attacks weekly, bi-weekly, and about twice a year.

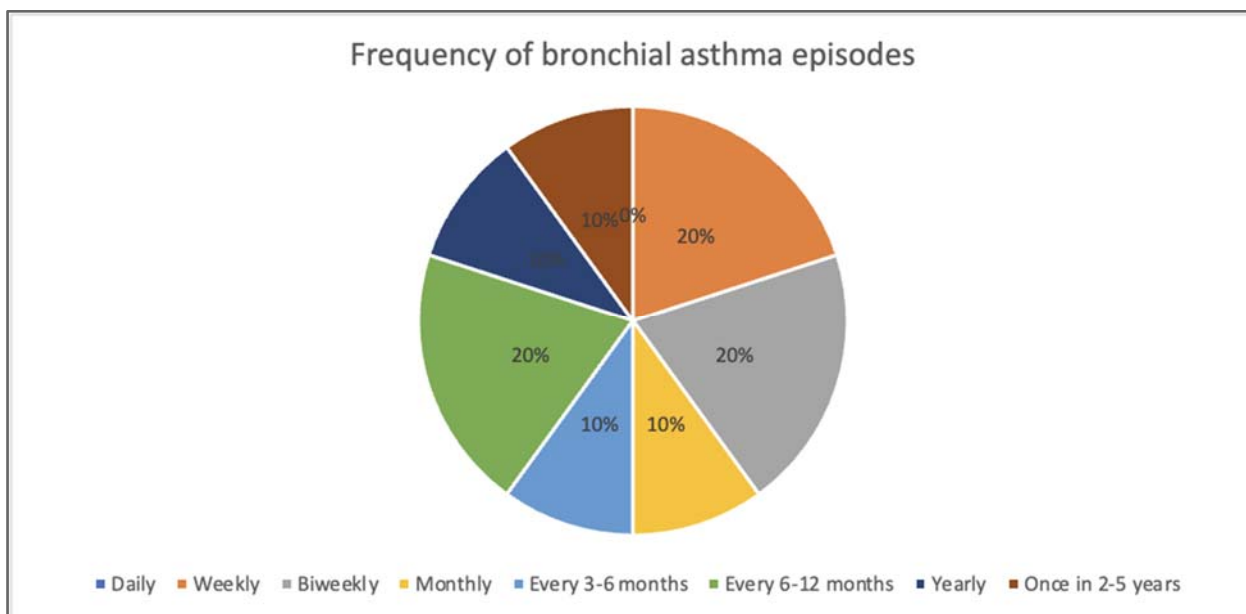


Fig.1 : Frequency of bronchial asthma episodes

Asthma episodes were most frequent during October, November, and December. As shown in Fig. 2, the most common triggers were infections such as colds, flu, or pneumonia; allergens such as food, pollen, mold, dust, and pet dander; and weather.

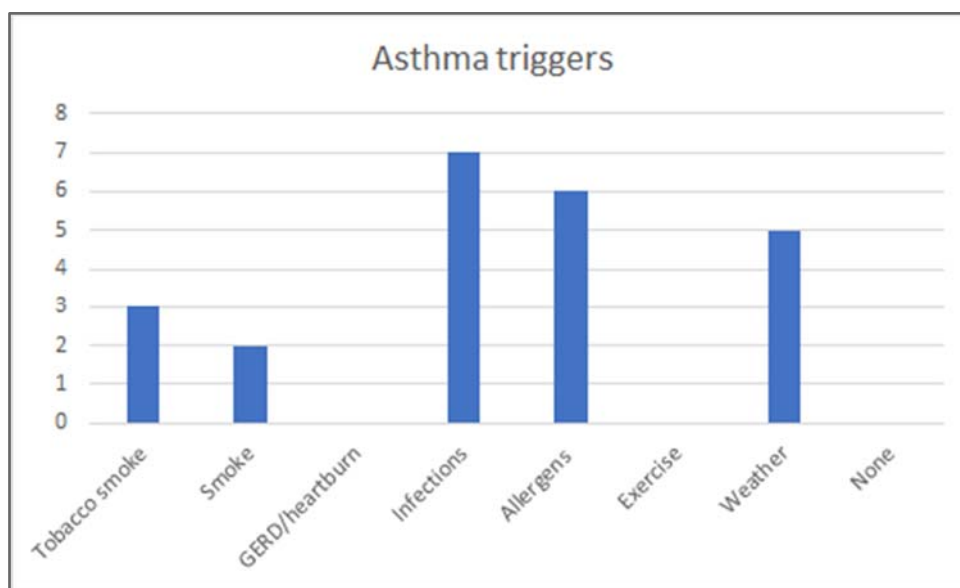


Fig. 2 : Trends of asthma triggers

70% (n=7) of participants with asthma noticed a positive family history while the remaining 30% (n=3) did not. Among those with positive family history 57.1% (n=4) had an affected father, 14.3% (n=1) had an affected mother, 14.3% (n=1) had an affected sibling and 20% (n=2) had other affected family members. Meanwhile, about 60.6% (n=20) noticed a positive family history of allergic rhinitis. Among those with positive family history for allergic rhinitis 38.1% (n=8) had an affected mother, 28.6% (n=6) had an affected father, 33.3% (n=7) had an affected sibling and 9.1% (n=3) had other affected family members.

90% (n=9) of individuals with asthma consulted a physician compared to only 39.4% (n=13) individuals with allergic rhinitis that consulted a physician. 51.2% (n=22) of participants are taking medications for their respective diseases. The most commonly used medications were antihistamines, followed by corticosteroids and decongestants (Fig. 3).

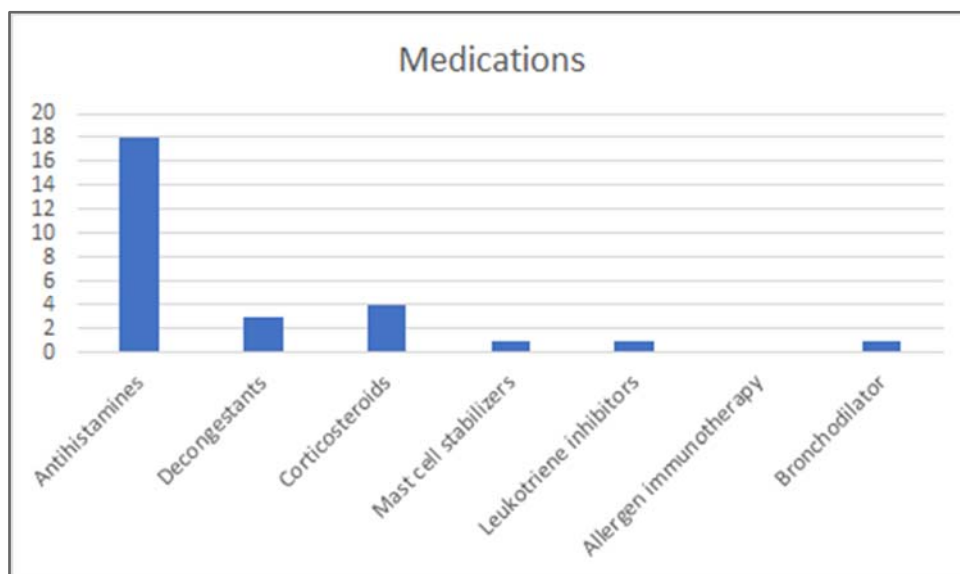


Fig. 3 : Common medications used by the participants with nasobronchial allergies or asthma

Cetirizine was the most commonly taken antihistamine, followed by diphenhydramine and levocetirizine. Common management techniques listed by the participants were steam inhalation, use of nasal sprays and nebulizers, and home remedies. 79.1% (n=34) of participants take preventive measures to control their conditions (Table 1).

Table 1 : Precautionary measures taken by the participants

Precautions	Number of participants	Percent
Avoid dust & sand	26	72.2
Ventilation and keeping house clean	24	66.7
Avoid pets	7	19.4
Avoid perfumes & air fresheners	7	19.4
Avoid carpets & curtains	2	5.6
Avoid food of any type	2	5.6
Avoid smoking or exposure to smoke	18	50

Avoid strenuous exercise	1	2.8
Avoid stress	1	2.8

For 70% (n=7) of those with bronchial asthma, the lifestyle changes entailing the Covid-19 pandemic did not affect their asthma episodes, whereas 20% (n=2) noticed an increased incidence. Those who had been infected with Covid-19 noticed no significant change in their asthma. For 66.7% (n=22) of those with allergic rhinitis, the lifestyle changes entailing the Covid-19 pandemic did not influence their condition, while 27.3% (n=9) noticed a decreased incidence. Out of those who had been infected with Covid-19, 15.2% (n=5) did not notice any change in symptoms, whereas another 15.2% (n=5) reported exacerbated symptoms.

IV. DISCUSSION

Nasobronchial allergies and asthma are diseases of the respiratory tract that are chronic and have overlapping pathophysiology, treatment, and management [1][2]. The study was conducted as an experiment to observe the prevalence of nasobronchial allergies and asthma among international university students in Tbilisi, due to the fact that the subject was less explored among the adult population in Eastern Europe. The study gathered 162 responses from international students in Tbilisi, the majority of whom belonged to South Asian ethnicity and had been residing in Tbilisi for a duration of 1 to 3 years. A large proportion of participants were aged between 18 to 21. 26.5% (n=43) of participants experienced either allergic rhinitis or bronchial asthma. Among the older participants belonging to ages 22 to 25, the prevalence of allergies and asthma was observed to be lower than that of those between the ages of 18 to 21. Many follow-up studies of asthma have shown that 50–70% of individuals with asthma lose their symptoms with an increase in age [6]. As shown in table 2, 87.9% (n=29) participants with allergic rhinitis were females and 12.1% (n=4) were males while among participants with bronchial asthma 50% (n=5) were female and 50% (n=5) were male (p=0.009). Similarly among the participants with bronchial asthma involved in this study, the severity of the disease was higher in females than in males. Studies have shown that due to an increase in sex hormones at puberty, asthma becomes more severe and prevalent in females [7][8].

Table 2 : Prevalence of allergic rhinitis and bronchial asthma among male and female participants

	Allergic Rhinitis	Bronchial Asthma	P-value
Male	4	5	p=0.009
Female	29	5	

The main symptoms described by participants with allergic rhinitis were sneezing, runny nose, and nose block followed by sore throat, airway irritation, and cough. Irrespective of the region where a study is conducted, the majority of the people suffer from similar symptoms which are caused by nasobronchial allergies [4]. Aeroallergens are an important cause of allergic respiratory disease worldwide [3]. In line with this, this study found that the most common allergens were dust and pollen respectively. Perfumes and fragrances were among the other common causes of nasobronchial allergies. Animal dander was also a common allergen described by the participants. Exposure to allergens of animal origin is a recognized risk factor in the development of sensitization and of several allergic diseases such as asthma, allergic rhinitis or conjunctivitis, and atopic dermatitis [9].

Upon infection with Covid-19, the participants experienced an exacerbation of their symptoms or no change at all.

Asthma is classically thought of as a disease that begins in youth [5]. The responses from the questionnaire showed that most of the participants had the onset of the disease in childhood. Common symptoms of asthma include wheeze, chest tightness, and cough and are often episodic and may vary in intensity [5]. Most of the participants experienced asthma during the winter months and cold

weather is known to cause bronchoconstriction. Allergic rhinitis has a significant genetic component which makes diagnosis easier with a positive family history for atopy.[10]. A study conducted by Raby et. al. suggested that a father's asthma history may be a predominant familial determinant of a patient's asthma [11]. The participants of this survey too showed a 57.1% (n=4) positive paternal history for bronchial asthma.

Asthma is listed as a risk factor for severe disease by the CDC in the case of COVID-19 infection [12][13]. However, the participants in this survey noticed no significant changes upon infection with Covid-19. This is in accordance with several studies conducted in China, Korea, and the USA that showed that asthma is not a risk factor for severe Covid-19 disease [14]. Patients with asthma risk exacerbation of symptoms not only related to Covid-19 but also related to other infectious and allergy triggers [13].

A significant proportion of the participants stated that they did not know their allergen and had not taken any tests to identify their allergen. This could be due to a general lack of awareness and knowledge about allergies and their symptoms amongst the population. The majority of the participants used antihistamines for their allergies and asthma. Other pharmacological options for nasobronchial allergies and asthma include intranasal steroids, leukotriene receptor antagonists (LTRAs), and immunotherapy [15]. The participants used precautionary measures such as avoiding their allergens and triggers, maintaining hygiene, and ensuring good ventilation. A study conducted by Storm van Leeuwen described how he successfully treated individuals with asthma by enclosing them in allergen-proof chambers [3][14].

The cross-sectional study format used for this paper is ideally suited for the assessment of the prevalence of the disease. However, this study was conducted on a small-scale and there is a need for a larger study with active participation from both the genders in order to learn more about the said diseases and their prevalence among adults in Tbilisi.

V. CONCLUSION

Out of the collected responses, about a quarter of the participants experienced either allergic rhinitis or bronchial asthma. A large proportion of participants with allergic rhinitis were females while among participants with bronchial asthma equal proportion of participants were male and female ($p=0.009$). The prevalence of allergic rhinitis and bronchial asthma was considerably lower among the older participants. Asthma was found to be more severe and prevalent in female participants. Awareness and a better understanding of the diseases and their management need to be introduced to the population to combat the underdiagnosis of these diseases and improve the overall quality of life.

VI. ACKNOWLEDGMENT

We would like to express our gratitude to Ms. Naga Harika Korrapati for her guidance throughout the research process involved in the making of this paper.

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