Afro-Asian Journal of Scientific Research (AAJSR)
المجلة الأفروآسيوية للبحث العلمي
E-ISSN: 2959-6505
Volume 3, Issue 3, 2025
Page No: 88-91
Website: https://aajsr.com/index.php/aajsr/index
SJIFactor 2024: 5.028 ISI 2024: 0.580 معامل التأثير العربي (AIF) 2023: 0.51

Study The Various Types of Allergies, and Its Correlation with Blood Grouping Among Medical Technology Students in Derna

Arig Alyasir [1*], Zaynab Alzalawi [2], Rawan Busheha [3], Maryam Dardak [4], Hadeel Juwayli [5], Abdualkarim Alzouki [6]
[1-6] Department of Drug Technology, Faculty of Medical Technology, Derna, Libya

دراسة أنواع الحساسية المختلفة وارتباطها بفصيلة الدم لدى طلاب التقنية الطبية في درنة

اريج اليسير [1*]، زينب الزلاوي [2]، روان بوشيحة [3]، مريم درداك [4]، هديل الجويلي [5]، عبدالكريم الزوكي [6]
[1-6] قسم تقنية الادوية، كلية التقنية الطبيه، درنه، ليبيا

*Corresponding author: a.a.alyaseer@gmail.com

Received: July 01, 2025	Accepted: August 01, 2025	Published: August 07, 2025

Abstract:
When the immune system overreacts to chemicals that do not affect the majority of people, a condition called allergies or hypersensitivity reactions develops. Pollen, animal dander, chemicals, fungi, or foods like nuts, eggs, shellfish, fish, and milk are examples of these substances, which are also known as allergens. A variety of illnesses, mostly affecting the skin but also affecting other organs like the liver, kidneys, and lungs, can be caused by immune reactions to small molecule compounds like drugs. Due to the significance of genetic factors, this study aimed to analyze the relationship between blood grouping and various types of allergies among medical technology students in Derna in 2023. It was survey-based research that used questionnaires (51 questionnaires) that were distributed to college students before data was collected and analyzed. The questionnaire included questions about the kind of allergy, blood group, symptoms, treatment, and if any family members had the same allergy. The blood group with the greatest proportion of all types of allergies included in this study was blood group A+, followed by blood group O+, which was the second highest blood group among all types of allergies. As a result, there was a connection between blood groups and different kinds of allergies.

Keywords: Allergies, Blood Groups, Respiratory System Allergy, Skin Allergy, Food Allergy.

الملخص
عندما يتفاعل الجهاز المناعي بشكل مبالغ فيه مع المواد الكيميائية التي لا تؤثر على غالبية الناس، تتطور حالة تسمى الحساسية أو تفاعلات فرط الحساسية. حبوب اللقاح ووبر الحيوانات والمواد الكيميائية والفطريات أو الأطعمة مثل المكسرات والبيض والمحار والأسماك والحليب هي أمثلة على هذه المواد، والتي تُعرف أيضًا باسم مسببات الحساسية. يمكن أن تحدث مجموعة متنوعة من الأمراض، التي تؤثر في الغالب على الجلد ولكنها تؤثر أيضًا على أعضاء أخرى مثل الكبد والكلى والرئتين، بسبب ردود الفعل المناعية لمركبات الجزيئات الصغيرة مثل الأدوية. ونظرًا لأهمية العوامل الوراثية، هدفت هذه الدراسة إلى تحليل العلاقة بين فصيلة الدم وأنواع الحساسية المختلفة بين طلاب التقنية الطبية في درنة في 2023. كان بحثًا قائمًا على المسح استخدم استبيانات (51 استبيانًا) تم توزيعها على طلاب الكلية تم جمع البيانات وتحليلها. تضمن الاستبيان أسئلة حول نوع الحساسية وفصيلة الدم والأعراض والعلاج وما إذا كان أي فرد من أفراد الأسرة يعاني من نفس الحساسية. كانت فصيلة الدم التي سجلت أعلى نسبة بين جميع أنواع الحساسية المشمولة في هذه الدراسة هي فصيلة الدم *A+*، تليها فصيلة الدم *O+*، التي احتلت المرتبة الثانية بين جميع أنواع الحساسية. ونتيجةً لذلك، وُجدت علاقة بين فصائل الدم وأنواع الحساسية المختلفة.

الكلمات المفتاحية: الحساسية، فصائل الدم، حساسيه الجهاز التنفسي، حساسيه الجلد، حساسية الطعام.

Introduction

The word "allergy" comes from the Greek "allos ergon," meaning "other work," and was first used in 1906 by Clemens von Pirquet, an Austrian doctor who taught at the universities of Wroclaw and Vienna. At first, it described how the body reacts differently to something like an antigen that's been introduced many times. Over time, the term became a general term for allergic reactions in the body [1]. Allergies are one of the most common health problems in today's world. More than 25% of people in developed countries have allergies [2].

Allergies, also called hypersensitive reactions, happen when the immune system reacts too strongly to certain substances that usually don't harm most people. These substances, known as allergens, can be things like pollen, animal skin, chemicals, mold, dust mites, or foods such as nuts, eggs, shellfish, fish, and milk [2]. When the immune system responds to small molecules like medicines, it can cause different illnesses, mostly affecting the skin, but also other parts of the body like the liver, kidneys, and lungs. Some drug-related allergic reactions happen slowly, while others occur quickly, like those that involve IgE antibodies. Food allergies can also cause problems, and they often lead to strict dietary rules, which cause worry and stress [3].

People experience different allergy symptoms, ranging from mild (like a runny nose) to severe. The type of symptom often depends on which part of the body is affected. For example, pollen in the air enters the nose and can cause breathing issues like coughing, a runny or itchy nose, nasal blockage, sneezing, and wheezing [2]. Food allergies can result in vomiting, nausea, stomach pain, and diarrhea. Skin allergies often lead to rashes, blisters, redness, and itching. Allergies are a form of sensitivity to proteins. Some people can be allergic to smaller molecules like penicillin, but for this to happen, the penicillin must attach to a protein.

The combination of penicillin and protein causes the allergic reaction [4]. Certain genetic and environmental factors can increase the chances of developing allergies. One of the biggest risk factors is family history. If a parent has allergies, their child has a 15% to 20% chance of also having them. The risk doubles if both parents have allergies [5].

There are different types of allergic reactions. These are called hypersensitivity reactions, and they are categorized into four types by Gell and Coombs in 1963 based on how they damage tissues.

Type I

These reactions are caused by allergen-specific IgE antibodies that attach to mast cells and basophils. When an allergen binds to these IgE antibodies, it causes the release of substances like histamine, which can lead to hives, swelling, and even anaphylaxis.

Type II:

These reactions involve IgG or IgM antibodies attaching to antigens on the surface of cells. This can result in tissue damage through processes like phagocytosis, complement system activity, or other forms of cell destruction.

Type III:

These reactions happen when immune complexes made of IgG or IgM and antigens build up in tissues, leading to direct damage to organs.

Type IV:

These reactions take at least 48 hours to appear after exposure to an allergen. They involve T cells and are triggered by the release of cytokines and chemokines from activated T cells [6].

Material and methods

This study was conducted at the College of Medical Technology in Derna city during January and February. It is a survey study (prospective sample) that relied on questionnaires (51 questionnaires) that were distributed to college students and waited until all questionnaire questions were answered and all questionnaire questions were clarified for those who had some inquiries. Then data was collected and an analysis of this data was performed. The questionnaire contained many questions, such as ginder, the type of allergy, the blood group, the symptoms, whether a treatment was used for this allergy or not, and whether there are any family members who also suffer from the allergy, due to the importance of genetic factors.

Results and discussion

The results of the analysis showed that the average of age was 21 for cases with range (19-26 year) Then the cases were divided according to the type of allergy into 4 groups the highest percentage of cases suffered from respiratory system allergies with a percentage of 52.94%, then skin allergies, followed by food allergies, and the lowest percentage of cases suffered from drug allergies with 49.01%, 11.67% and 3.92 respectively as presented in Table 1.

Table 1: Types of Allergies.

Types of allergies	Percent of allergies
skin	49.01
Food	11.76
Respiratory	52.94
Drug	3.921

Each of the four types of allergies (skin allergy, food allergy, respiratory system allergy, and drug allergy) was considered separately in terms of the distribution of blood types for each allergy, The results were as follows for skin allergies: 40% of the cases suffering from skin allergies were blood type A+, while 36% were blood group O+, 12% were blood group B+, and 8% were blood group AB+ And 4% for blood group A - However, as for the B-, AB-, and O-blood types, these types were not present in the cases suffering from skin allergy, Most cases of skin allergies included Atopic dermatitis (Eczema) (52%), urticaria(36%) and Photo allergic (12%) Regarding food allergy and drug allergy, the cases were equally distributed between blood groups A+ and O+, with percent of 50%.

As for food allergies, the food allergy cases were allergic to tomatoes, barley, watermelon, and nuts and Regarding drug allergy, the cases of drug allergy were allergic to azithromycin and Panadol, regarding respiratory allergies, the highest percentages were for blood types A+ and O+, with percent 40.74% and 29.62%, respectively, followed by 14.81%,7.40% for blood group B+ and AB+ respectively, the cases were equally distributed between blood groups A- and B-, with percent of 3.70 %. For blood group AB- and O- these blood groups were not present in the cases suffering from respiratory allergies. As shown in the Table (2) and Figure (1).

Table 2: Distribution of blood groups according to the type of allergy.

Type of Allergy / Blood group	Skin allergy (%)	Food allergy (%)	Respiratory allergy (%)	Drug allergy (%)
A+	40	50	40.740	50
A-	4	0	3.70	0
B+	12	0	14.81	0
B-	0	0	3.70	0
AB+	8	0	7.40	0
AB-	0	0	0	0
O+	36	50	29.62	50
O-	0	0	0	0

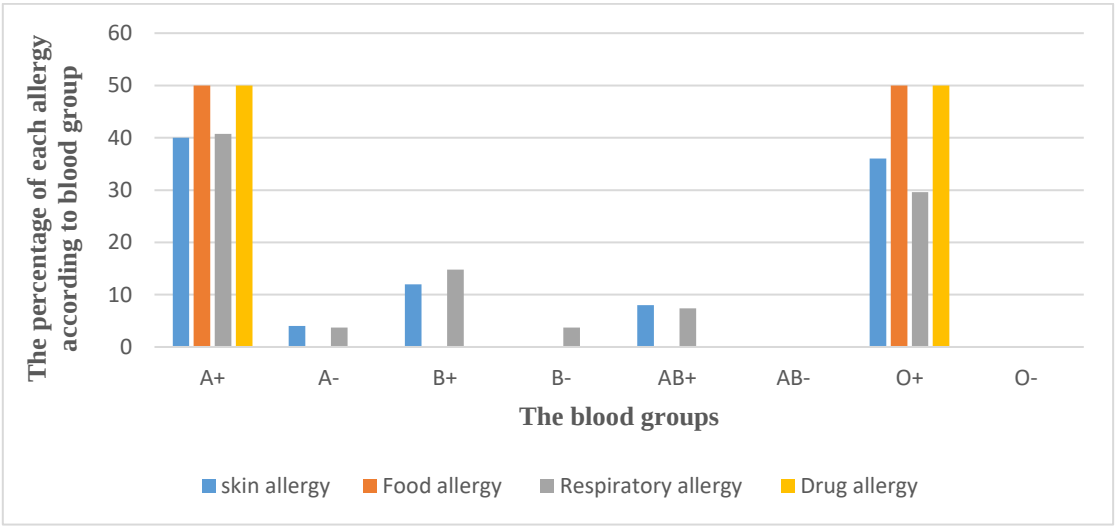

Figure 1: Distribution of blood groups according to the type of allergy.

After analyzing the results for each type of allergy, it was found that blood group A+ is the blood group with the highest percentage of all types of allergies included in this study, with percent up to 50% for food allergy and drug allergy, and 40.74% and 40% for respiratory system allergy and skin allergy, respectively. Followed by blood group O+, which was the second highest blood group among all types

of allergies, with a percentage of up to 50% for food allergies and drug allergies, while for skin allergies and respiratory allergies, the percentage was 36% and 29.62% respectively.

The percentage of O- and AB - blood groups was zero for all types of allergies. By comparing the results of this study with the results of previous studies, it was found that the blood type O+ was the blood type with the is correlated with AR and asthma, Additionally, one study found that blood group A was the predominant type in asthma patients versus controls [5]. While in another study, blood type +A was the most common in patients suffering from allergic rhinitis (respiratory allergy) [7]. This is consistent with the results of this study, as blood type A+ is the blood type with the highest percentage of respiratory allergies. Regarding skin allergies, one study showed that blood types A and B were high Risk of developing AD (Atopic dermatitis) [5]. These results are relatively consistent with the results of our study in that blood type A is associated with skin allergies.

Conclusion

In our study for correlation between different types of allergies, such as (skin allergy, food allergy, respiratory allergy, drug allergy), and blood groups. it was found that blood group A+ is the blood group with the highest percentage of all types of allergies included in this study, followed by blood group O+, which was the second highest blood group among all types of allergies. Thus, there is correlation between various types of allergies and blood groups and people with blood types A+ and O+ are the people most susceptible to various types of allergies

References

[1] W. Zukiewicz-Sobczak *et al.*, “Allergic diseases - Current state of knowledge,” *Postepy Dermatol Alergol*, vol. 29, no. 6, pp. 451–455, 2012.

[2] M. A. Ahmed Elshemy*1, “Allergic Reaction: Symptoms, Diagnosis, Treatment and Management,” *Journal of Scientific & Innovative Research*, vol. 2, no. 123–144, 2013.

[3] M. A. Baik *et al.*, “Classification and management of hypersensitivity reactions,” *Int J Community Med Public Health*, vol. 9, no. 12, p. 4731, 2022.

[4] W. J. Meggs, “Mechanisms of allergy and chemical sensitivity,” *Toxicol Ind Health*, vol. 15, no. 4, pp. 331–338, 1999.

[5] N. H. Dahalan, S. A. Tuan DIn, and S. M. B. Mohamad, “Association of ABO blood groups with allergic diseases: A scoping review,” *BMJ Open*, vol. 10, no. 2, pp. 1–8, 2020.

[6] Ph. D. Melanie C. Dispenza, M. D., “Classification of hypersensitivity reactions,” *Allergy Asthma Proc*, vol. Vol. 40, N, pp. 470–473.

[7] S. Cildag, O. Kaman, G. Sargin, I. Yavasoglu, and T. Senturk, “Association of ABO Rh Blood Groups with Allergic Rhinitis and Distribution According to Allergen Types,” *Asthma Allergy Immunology*, vol. 20, no. 2, pp. 77–80, 2022.