

Prevalence of Food Allergies in Punjab, Pakistan

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Abstract

Food allergies are serious health issues around the globe but people often neglect them. In current survey, large and small both cities were randomly selected to determine prevalence of food allergies and obtained results showed that major sufferers are teenager. Whereas gender based comparison showed that females are at more verge of exposure than males and in addition to this, female patients also don't take proper medication for recovery. The possible routes of allergens are intake of unhygienic water and improperly cooked food. Commonly reported symptoms are nausea, vomiting, diarrhea and skin itching. So it is need of time to address these issues and finding of their remedies along with programed general public awareness to reduce prevalence of food allergies.

Keywords: Food allergies, prevalence, allergens, unhygienic, nausea, vomiting, diarrhea, general public awareness.

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INTRODUCTION

Food allergy is a worldwide health problem and an immunological response of a reaction between certain dietary proteins e.g., haptens with immunoglobulin either (Ig) E-mediated or non-Ig E-mediated [1, 5, 21, 22]. Any food can cause allergy but overall only a few foods account for the vast majority of allergies. These include milk, eggs, shellfish, wheat, and nuts [4]. These allergic reactions may occur with symptoms of skin, nose, eyes, gastrointestinal and respiratory tracts related physiological changes mostly within two hours of ingestion or exposure to the triggering food (antigen) [2, 8,9].

Though its prevalence rate is uncertain but the incidence appears to have increased over the past three decades, especially in countries with a western lifestyle [3]. The food allergens are usually water-soluble glycoproteins that are resistant to breakdown and are easily transported across the mucosal surface in the intestine. Risk factors for severe food allergies may include: asthma, prior episodes of anaphylaxis and delayed stimulation of epinephrine [21, 22]. These allergies are usually linked with both genetic and environmental factors [11]. Still the rapidly rising

prevalence of food allergy has now been globally recognized as the second wave of the allergy epidemic [12]. Due to which up to 3% of youngsters in the US [12] and 9.5% of Australian newborns aged 11–15 months are now allergic to nuts and eggs, respectively [13,14] and preventions based guidelines are under consideration of suffered countries [15-17].

METHOD

This study was cross-sectional detailed surveys [23, 24] of residents belong from different regions (Sialkot, Lahore, Narowal, Shakarghar and Daska) of the Punjab, Pakistan. For this purpose, a questionnaire was designed to evaluate the level of awareness, common practices and handling of food allergy patients (Table 1) and it was filled by 120 people. Later on, ANOVA was used for statistical analysis [19]. This study was approved by Minhaj University Lahore. Informed verbal consent was taken from participant before answering the questionnaire. Amenable participants were informed in detail by the researcher about the research project and its consequences. Privacy of patients was assured during the filling of the questionnaire [20].

Table-1: Food allergy survey in Punjab region, Pakistan

| Age | 18-22 yrs | 23-28 yrs | 32-35 yrs | <35 yrs |
|----------------------|-------------------------------|-----------|-------------------------------------|---------|
| Gender | Female | | Male | |
| Possible cause | a) Intake of unhygienic water | | b) Intake of improperly cooked food | |
| Intake of medication | Yes | | No | |
| Symptoms | Yes | | No | |
| Itching | | | | |
| Nausea & vomiting | | | | |
| Wheezing | | | | |
| Diarrhea | | | | |
| Hives | | | | |
| Anaphylaxis | | | | |
| Urticarial | | | | |
| Asthma | | | | |
| Venom allergy | | | | |

RESULTS & DISCUSSION

The obtained ANOVA results of age wise data high lights that age group A is significantly suffering (with 0.1% probability level) than others (Table 2). It is mainly due to poor immune system and more exposure

to unhygienic and improperly cooked food due to various life obligations like academic and professional responsibilities of this age group and people are frequently bound to stay away from homes and healthy food [27].

Table-2: People suffering from food allergies in Punjab region

| Age Groups | Mean ± SEM |
|------------|---------------|
| A | ***11.2 ± 0.7 |
| B | 6.8 ± 1.715 |
| C | 3.6 ± 0.51 |
| D | 2.4 ± 0.7 |

Moreover, according to the gender wise comparison, females are major sufferer of food allergies (Figure 1) because in females’ serum IgE, IgG4, and

Serum tryptase levels usually become quickly elevated after exposure of food allergens [28].

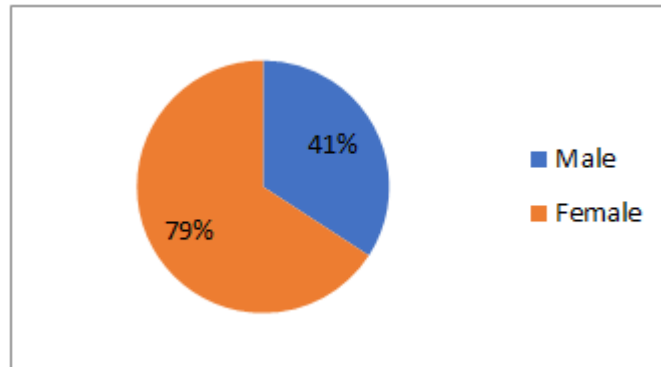


Fig-1: Gender based comparison for food allergies

When data related to causative agents were analyzed, it was obvious that 64% people who take improper food are more at risk to food allergies (Among them further categorization is as follows: Fast Food 60%, Junk Food: 30%, Dry Fruits: 10%). Whereas 36% patients after intake of unhygienic water, face such

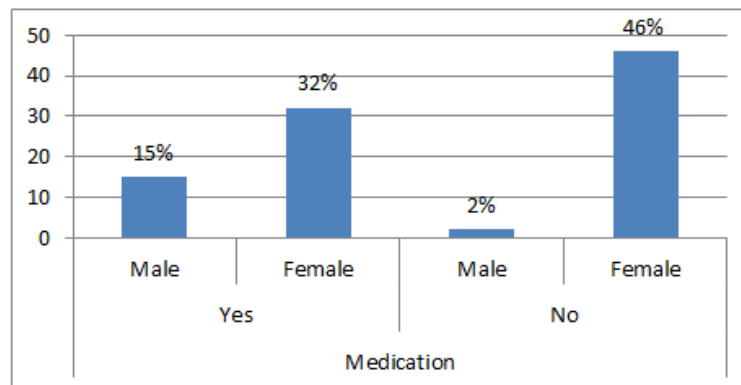
allergies. The major responsibility is of food authority department to underscore such fast and junk food points and they should also check drinking water quality. This will help to improve the quality of life for food allergic ones [29]. Prevalence of common symptoms of food allergies is as follows (Table 3):

Table-3: Commonly reported symptoms of food allergies

| Symptoms | Male | Female |
|----------|------|--------|
| Diarrhea | 3 | 21 |
| Vomiting | 7 | 20 |
| Itching | 3 | 12 |
| Nausea | 2 | 40 |
| Others | 5 | 35 |

Similarly, results of medication intake were quite striking (Figure 2). Because 46% females don't take such food allergies seriously and simply ignore and linger on them. Though according to the current survey, they are major sufferers too. On other hand, gents face

less such issues and 15% of them take treatment properly. The reasons behind these behavioral variations are broad spectrum socioeconomic factors and lack of standard treatments and proper awareness [30].

**Fig-2: Medication intake pattern**

CONCLUSION

It can be concluded that in less developed regions of Punjab still people are still unaware of causes and cures of food allergies and in this regard, proper general public awareness is required and also a need of finding the reasons that why people ignore them, though like other ailments they are intolerable too still is the socioeconomic factor is only potent root cause or other factors also influence this aspect? As this data shows mainly people awareness level how they handle these allergies and consult proper medical aid or not. Another important aspect is, people of the selected regions are more incline to meat intake which often transfer several pathogens, may serve as stimulatory food allergens [25] and due to poor hygienic conditions, aflatoxins poisoning may also cause food allergies among masses [26]. So, these questions should be addressed by future researchers.

REFERENCES

- Loh, W., & Tang, M. L. (2018). The epidemiology of food allergy in the global context. *International journal of environmental research and public health*, 15(9), 2043.
- Dinakar, C., & Warady, B. (2016). Food Allergy Care: "It Takes a Team". *Missouri Medicine*, 113(4), 314.
- Pham, M. N., & Bunyavanich, S. (2018). Prenatal diet and the development of childhood allergic diseases: food for thought. *Current Allergy and Asthma Reports*, 18(11), 1-16.
- Chang, K. L., & Guarderas, J. C. (2018). Allergy testing: Common questions and answers. *American Family Physician*, 98(1), 34-39.
- Budimir, J., Mravak-Stipetić, M., Bulat, V., Ferček, I., Japundžić, I., & Lugović-Mihić, L. (2019). Allergic reactions in oral and perioral diseases—what do allergy skin test results show?. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, 127(1), 40-48.
- Rial, M. J., & Sastre, J. (2018). Food allergies caused by allergenic lipid transfer proteins: what is behind the geographic restriction?. *Current Allergy and Asthma Reports*, 18(11), 1-5.
- Shroba, J., Rath, N., & Barnes, C. (2019). Possible role of environmental factors in the development of food allergies. *Clinical reviews in allergy & immunology*, 57(3), 303-311.
- Kumar, R., Kumari, D., Srivastava, P., Khare, V., Fakhr, H., Arora, N., ... & Singh, B. P. (2010). Identification of IgE-mediated food allergy and allergens in older children and adults with asthma and allergic rhinitis. *The Indian journal of chest diseases & allied sciences*, 52(4), 217.
- Faber, M. A., De Graag, M., Van Der Heijden, C., Sabato, V., Hagendorens, M. M., Bridts, C. H., ... & Ebo, D. G. (2014). Cor a 14: missing link in the molecular diagnosis of hazelnut allergy?. *International archives of allergy and immunology*, 164(3), 200-206.
- Burks, A. W., Jones, S. M., Wood, R. A., Fleischer, D. M., Sicherer, S. H., Lindblad, R. W., ... &

- Sampson, H. A. (2012). Oral immunotherapy for treatment of egg allergy in children. *New England Journal of Medicine*, 367(3), 233-243.
11. Silva, L. A., Silva, A. F. M., Ribeiro, Â. C., Silva, A. O., Vieira, F. A., & Segundo, G. R. (2016). Adult food allergy prevalence: reducing questionnaire bias. *International archives of allergy and immunology*, 171(3-4), 261-264.
 12. Prescott, S., & Allen, K. J. (2011). Food allergy: riding the second wave of the allergy epidemic. *Pediatric allergy and immunology*, 22(2), 155-160.
 13. Bunyavanich, S., Rifas-Shiman, S. L., Platts-Mills, T. A., Workman, L., Sordillo, J. E., Gillman, M. W., ... & Litonjua, A. A. (2014). Peanut allergy prevalence among school-age children in a US cohort not selected for any disease. *Journal of Allergy and Clinical Immunology*, 134(3), 753-755.
 14. Peters, R. L., Koplin, J. J., Gurrin, L. C., Dharmage, S. C., Wake, M., Ponsonby, A. L., ... & Study, H. (2017). The prevalence of food allergy and other allergic diseases in early childhood in a population-based study: HealthNuts age 4-year follow-up. *Journal of Allergy and Clinical Immunology*, 140(1), 145-153.
 15. Natsume, O., Kabashima, S., Nakazato, J., Yamamoto-Hanada, K., Narita, M., Kondo, M. (2017). Two-step egg introduction for prevention of egg allergy in high-risk infants with eczema (PETIT): a randomised, double-blind, placebo-controlled trial. *Lancet*, 389, 276-286.
 16. Ierodiakonou, D., Garcia-Larsen, V., Logan, A., Groome, A., Cunha, S., Chivinge, J. (2016). Timing of allergenic food introduction to the infant diet and risk of allergic or autoimmune disease: a systematic review and meta-analysis. *JAMA*, 316, 1181-1192.
 17. Togias, A., Cooper, S. F., Acebal, M. L., Assa'ad, A., Baker, J. R., Beck, L. A., ... & Boyce, J. A. (2017). Addendum guidelines for the prevention of peanut allergy in the United States: report of the National Institute of Allergy and Infectious Diseases-sponsored expert panel. *World Allergy Organization Journal*, 10(1), 1-18.
 18. Netting, M.J., Campbell, D.E., Koplin, J.J., Beck, K.M., McWilliam, V., Dharmage, S.C. (2017). An Australian consensus on infant feeding guidelines to prevent food allergy: outcomes from the Australian Infant Feeding Summit. *J Allergy Clin Immunol Pract.*, 5, 1617-1624.
 19. Kozak, M., & Piepho, H.P. (2018). What's normal anyway? Residual plots are more telling than significance tests when checking ANOVA assumptions. *Journal of Agronomy and Crop Science*, 204(1), 86-98.
 20. Aslam, S., Javed, A., Fatima, T., Hashmi, H. I., Khurshid, S., Shahid, A., & Khalid, S. (2021). Prevalence of gastrointestinal infections in hostel residents of Lahore, Pakistan. *American Academic Scientific Research Journal for Engineering, Technology, and Sciences*, 81(1), 177-185.
 21. Sicherer, S. H., & Sampson, H. A. (2010). Food allergy. *Journal of allergy and clinical immunology*, 125(2), S116-S125.
 22. Mattison, C. P., Bren-Mattison, Y., Vant-Hull, B., Vargas, A. M., Wasserman, R. L., & Grimm, C. C. (2016). Heat-induced alterations in cashew allergen solubility and IgE binding. *Toxicology reports*, 3, 244-251.
 23. Javed, A., Hashmi, H. I., Shahid, A., Mehmood, S., & Khurshid, S. (2021). Survey of hypocalcaemia frequency in district Lahore, Pakistan. *American Academic Scientific Research Journal for Engineering, Technology, and Sciences*, 80(1), 101-106.
 24. Javed, A., Saleem, S., Saeed, M., Raza, H., Shahid, B., & Islam, K. (2021). Influence of socio-demographic variables on prevalence of hypertension in Lahore division, Pakistan. *American Academic Scientific Research Journal for Engineering, Technology, and Sciences*, 81(1), 186-191.
 25. Javed, A., Zulfiqar, A., Irum, T. & Asalm, T. (2019). Microbial infections transmission through meat intake in Pakistan. *American Academic Scientific Research Journal for Engineering, Technology, and Sciences*, 59(1), 93-104.
 26. Javed, A., Shahid, M. B., Naeem, H., Jam, A. H., Nawaz, A., & Nazeer, A. (2022). Aflatoxins Poisoning. *Haya Saudi J Life Sci*, 7(2), 34-37.
 27. Jafri, S., Frykas, T. L., Bingemann, T., Phipatanakul, W., Bartnikas, L. M., & Protudjer, J. L. (2021). Food Allergy, Eating Disorders and Body Image. *Journal of Affective Disorders Reports*, 6, 100197.
 28. Naef Al-Falahi, N. A. H., Lafi, S. A., & Hassan, A. S. (2020). Role of alpha trypticase enzyme, total IgE, specific IgE & IgG4 in patients with food allergy. *Egyptian Academic Journal of Biological Sciences, G. Microbiology*, 12(2), 49-58.
 29. Oriel, R. C., Waqar, O., Sharma, H. P., Casale, T. B., & Wang, J. (2021). Characteristics of food allergic reactions in United States restaurants. *The Journal of Allergy and Clinical Immunology: In Practice*, 9(4), 1675-1682.
 30. Muthukumar, J., Selvasekaran, P., Lokanadham, M., & Chidambaram, R. (2020). Food and food products associated with food allergy and food intolerance—An overview. *Food Research International*, 138, 109780.