



Original Article

Occurrence of Allergic Contact Dermatitis in Rajshahi City and its relation with some of the socio-demographic characteristics

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Abstract

There is no detailed and updated data on Allergic Contact Dermatitis (ACD) in our country. The present study is designed in this situation to reveal the occurrence of allergic contact dermatitis in Rajshahi city and its association with some of the socio-demographic characteristics like sex, socio-economic status, co-morbidity etc. It was a cross-sectional type of descriptive study, conducted upon the general population of urban community of Rajshahi City. 153 respondents were randomly selected of which 76 were male and the rest 77 were female. People of all the ages and all the family members of the selected areas were included in the study, who were present at home at the time of data collection. Data were collected by face-to-face interview with the help of a semi-structured questionnaire. Allergic contact dermatitis was clinically diagnosed by the researchers themselves by direct physical examination after obtaining their symptoms, with the help of common medical equipments like a magnifying glass, a torch etc. Verbal consents were taken for ethical consideration. Occurrence of allergic contact dermatitis was found to be 20.26% in the urban community of Rajshahi City of which 18.42% were male and 22.08% were female – statistically no significant difference was there. Among the different socio-economic status, the middle class had the highest occurrence rate (28.41%) and Chi-square test showed here statistically significant difference between the groups [$X^2 = 10.591$, $df=2$, $p=0.00501411$]. The co-morbidity was found to be higher in female respondents with a statistically significant difference [$X^2 = 5.231$, $df = 1$, $p = 0.02218777$].

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Introduction

Allergic Contact Dermatitis (ACD) is a common skin disease. It may be defined simply as a delayed hypersensitivity reaction in which a foreign substance comes into contact with the skin; skin changes occur after re-exposure to the substance¹. It actually occurs after repeated exposure to an allergen triggering an immune response that inflames the skin².

To explain a little more elaborately, ACD occurs when a substance to which a person is sensitive (allergen) triggers an immune reaction in his skin

^{3,4,5,6}. It may be triggered by something that enters our body through foods, flavorings, medicine, or medical or dental procedures (systemic contact dermatitis).

The skin of a person can be sensitized by a strong allergen (e.g. poison ivy) even after a single exposure – again, multiple exposures may be necessary to trigger an allergy over several years by the weaker allergens. Once an allergy to a substance is developed, even a small amount of it can cause an allergic reaction³.

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The explanation of the sequence of events in a previously sensitized individual is as follows: The antigen penetrates the epidermis and is picked up by a Langerhans cell sensitized to it. It is then transported to the regional lymph node where the paracortical region produces a clone of T cells specifically programmed to react to that antigen. The sensitized T cells accumulate at the site of the antigen and react with it to produce an inflammatory response. This takes 48 hours and is amplified by interleukins that provide a feedback stimulus to the production of further sensitized T cells⁷.

Unfortunately there is no detailed and updated data on Allergic Contact Dermatitis in our country. Scarcity of epidemiological information regarding prevalence, influence of possible risk factors or causative agents and possible changes in the occurrence of the problem over place and time worsen the condition for any advanced study. There is little scope for comparison which causes difficulty to take any decision for future planning, controlling or further development of the situation. The present study is designed in these circumstances to reveal the occurrence of allergic dermatitis in Rajshahi city and its association with some of the socio-demographic characteristics like sex, socio-economic status and co-morbidity situation of the people. It is believed to play a significant role for the future development of the situation.

Material and Methods

It was a cross-sectional type of descriptive study, conducted upon the general population of urban community of Rajshahi City. 153 respondents were randomly selected of which 76 were male and the rest 77 were female. People of all the ages and all the family members of the selected areas were included in the study, who were present at home at the time of data collection. Data were collected by face-to-face interview with the help of a semi-structured questionnaire. Allergic manifestations were clinically diagnosed by the researchers themselves by direct physical examination after obtaining their symptoms, with

the help of common medical equipments like a magnifying glass, a torch etc. At the beginning, the purpose and nature of the study were explained clearly to the respondents and verbal consents were taken for ethical consideration. Data were entered in the computer and processed using SPSS programme for windows. Descriptive analytical techniques involving frequency distribution, computation of percentage etc were applied. Chi-square test and Fisher's exact test were applied to find out the association of allergic dermatitis with the socio-demographic characteristics.

Results

Occurrence of allergic dermatitis was found to be 20.26% in the urban community of Rajshahi City. Out of a total of 153 respondents, 14 (18.42%) male and 17 (22.08%) female had the problem of allergic contact dermatitis and there was no statistically significant difference between them (Figure – 1).

Among the different socio-economic status, the poor class had 2.7%, the middle class 28.41% and the rich class had 17.24% of respondents with allergic contact dermatitis. Chi-square test showed here statistically significant difference between the groups [$X^2 = 10.591$, $df=2$, $p=0.00501411$] (Table – 1).

Regarding co-morbidity, 8 male respondents were found to have had single manifestation of allergic dermatitis out of 14. Among the rest 6, 3 had allergic dermatitis with allergic rhinitis and 1 with allergic conjunctivitis, 1 with allergic bronchitis and another one with both allergic rhinitis and allergic bronchitis. Single manifestation of allergic dermatitis in female respondents was found in only 3 cases out of a total 17 positive cases. Among the rest 14, 4 had allergic dermatitis with allergic conjunctivitis, 3 had it with allergic rhinitis, 1 with allergic bronchitis and 4 had allergic dermatitis with both allergic conjunctivitis and rhinitis. There were 2 females having all the four manifestations. The co-morbidity was found to be higher in female respondents and the difference was statistically significant [$X^2 = 5.231$, $df = 1$, $p = 0.02218777$] (Table – 2).

Discussion

The occurrence of allergic contact dermatitis was found 20.26% in this study. Dotterud (2007) carried out a survey on 531 adults in Norway and found that the lifetime prevalence of contact dermatitis was 46.8% there and the skin reaction to metal was 35.0%, much higher than the present study⁰⁸. It was also stated in the same article that 20% or more of the adult population were then suffering from contact allergy in so many countries of the world, as seen in this study.

Mortz, Bindslev-Jensen and Andersen (2013) conducted their study over a 15-year period and their result for the point prevalence of contact allergy was 20.1%, and present or past ACD was found in 12.9% of those followed⁰⁹.

The study of Bordel-Gómez, Miranda-Romero and Castrodeza-Sanz (2010) showed prevalence of allergic contact dermatitis to be 28.2%¹⁰.

Militello, Jacob and Crawford (2006) stated that 20% of the paediatric populations were affected by allergic contact dermatitis. They also found that this occurrence rate is in an increasing trend¹¹. Jackson et al (2013)¹² estimated prevalence of skin allergies in under 18 US children as 12.5% in the period of 2009 to 2011 which was increased from 7.4% in 1997 to 1999 period.

In Nepal, a total of 61 clinically diagnosed patient of hand eczema were studied within a period of one year. Contact allergy was observed there in 55.3% of the cases¹³.

In an Indian study conducted in Rajasthan, Balai, Khare, Gupta, Mittal and Kuldeep (2012) made 1027 diagnoses in 1000 children, out of which 105 (10.22%) children showed hypersensitivity in their skin¹⁴.

These two studies could not be compared with this study as those studies calculated percentage of skin allergy from the people having skin diseases, and not from the general population.

Sarma and Ghosh (2010) studied 70 Indian children and found 56 (80%) of them to have positive allergic reactions in the skin. Among

these patients, 34 (60.7% of all positive test, 48.6% of all patients) had relevant reactions¹⁵.

Duarte (2011) in her private clinic treated 2618 patients with dermatitis in a period from 1999 to 2009, of which she found 134 (5.1%) to have had allergic contact dermatitis and these patients with ACD were predominantly female (94.18%)¹⁶.

The sex distribution of occurrence of allergic contact dermatitis in this study showed no significant difference between male and female groups statistically. Duarte's study showed a clear difference from this scenario as the females were found there to have predominantly higher occurrence of allergic contact dermatitis¹⁷. Similar results were also found in the studies of Dotterud⁰⁸, Hossain¹⁹ and Sarma and Ghosh¹⁷. However, chi-square analysis showed that sex had no significant role on the prevalence of allergy.

Modjtahedi, Modjtahedi and Maibach (2004) declared that there was no definite consensus on whether sex was indeed an endogenous factor in allergic contact dermatitis. They commented that different exposure patterns played an important role to develop allergic contact dermatitis in female sex more than it was in the males, where intrinsic skin characteristics had little or no significant role at all¹⁸.

Regarding different socio-economic status, this study showed the middle class having the higher occurrence of allergic contact dermatitis (28.41%) than the poor and rich classes. Chi-square test showed here statistically significant difference between the groups [$X^2 = 10.591$, $df=2$, $p=0.00501411$]. Montnemery, Nihlén, GöranLöfdahl, Nyberg and Svensson (2003) also found relation of eczema with the socio-economic status, though with a little difference. They found that the prevalence of self-reported eczema among the economically active population varied from 17.1% to 8.2% with the highest rates among assistant non-manual employees population i.e. among the lower social position. However, when controlling for age, gender and risk occupation there was no association between low social

position and eczema unlike this study¹⁹. Rahman, Sultana, Rahman and Bilgrami (2005) had similar result in their study (as Montnemery et al) with the highest prevalence rate in the low socio-economic class²⁰.

It was also found that the people of the working class were more exposed to the allergens and the

prevalence of Occupational Contact Dermatitis was the highest among all the types of contact dermatitis. So according to the nature of exposure, the people from the lower economic class of the society were more prone to develop allergic contact dermatitis than the others²¹

Conclusion

The result as shown in this study is no doubt an alarming one. This high occurrence rate should be considered as a problem of public health importance and should be given highest level of attention from the government side. The environmental control programmes should be given a priority and health education regarding various types of allergens and ways of its avoidance should be spread at all levels including national institutional and non-institutional education programmes. Then the prevalence of allergic contact dermatitis may be expected to reduce in this country satisfactorily.

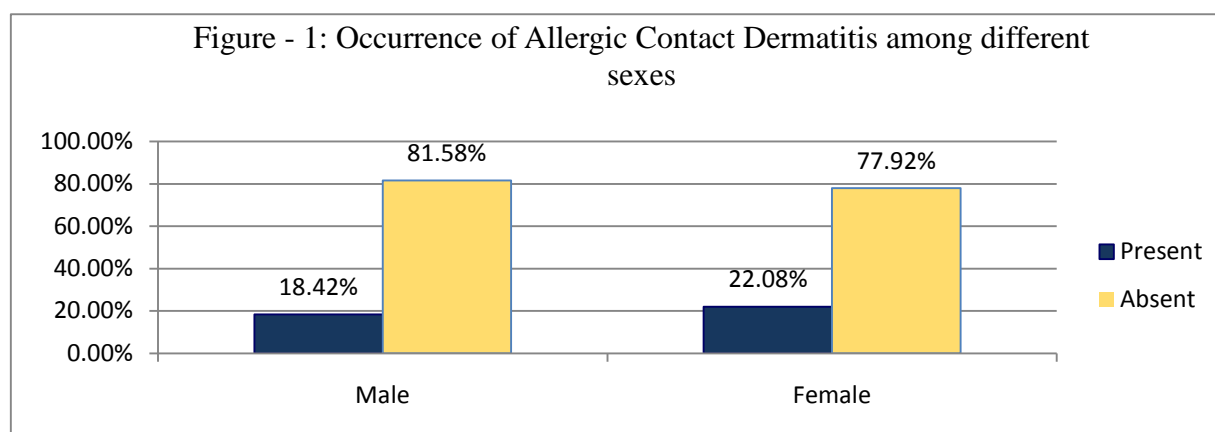


Table – 1: Occurrence of allergic contact dermatitis among different socio-economic status

Socio-economic Status	Allergic Dermatitis		Total
	Present	Absent	
Poor Class	1 (2.78%)	35 (97.22%)	36 (23.53%)
Middle Class	25 (28.41%)	63 (71.59%)	88 (57.52%)
Rich Class	5 (17.24%)	24 (82.76%)	29 (18.95%)
Total	31 (20.26%)	122 (79.74%)	153 (100%)

$$X^2 = 10.591, df = 2, p = 0.00501411$$

Table – 2: Types of co-morbidity

Respondents	Single Dermatitis	With Conj	With Rhin	With Bron	With Con & Rhin	With Rhin & Bronch	All the Four	Total
Male	8 57.14%	1 7.14%	3 21.43%	1 7.14%	0 0.00%	1 7.14%	0 0.00%	14 45.16%

Female	3 17.65%	4 23.53%	3 17.65%	1 5.88%	4 23.53%	0 0.00%	2 11.76%	17 54.84%
Total	11 35.48%	5 16.13%	6 19.35%	2 6.45%	4 12.90%	1 3.23%	2 6.45%	31 100%

Conj = Conjunctivitis, Rhin = Rhinitis, Bron = Bronchitis. $X^2 = 5.231$, $df = 1$, $p = 0.02218777$

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