

Sensitization profile to the cockroach and predisposing factors in consulted children in a pneumo-allergology unit in Togo

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Abstract

Introduction: allergic pathologies resulting from cockroaches are described to be sources of a relatively frequent sensitivity. The purpose of this work was to study the profile to be sensitized to the cockroach in children. **Methods:** This was a cross-sectional study that took place from the 1st July 2015 to the 31st July 2018. The pneumo-allergology unit at Lomé teaching hospital was the location for this study. This study involved children aged 0 to 18 years whom after acceptance and realization of skin tests were sensitized to the cockroach. **Results:** We registered in total 102 patients aged 0 to 18 years; the frequency of skin tests was 38.8% and 37.9% for cockroach sensitization. Children aged 5 to 10 years were found in 35.3%. Rhinitis was the most common antecedent in 47%. Asthma was found in 35.3%. **Conclusions:** Cockroach sensitization was a real problem in pediatrics.

Keywords: Sensitization, Cockroaches, Children, Skin-test.

INTRODUCTION

Infestation by cockroaches and the resulting allergy are common problems in many countries where cockroaches occupy second position causing allergy after house dust mite.[1] Indeed, the modernization of life, the recent urbanization and the decrease of premises ventilation, increase the concentration of household allergens including cockroaches.[1] The main objective of our work was to determine the profile of sensitization to cockroach of children being consulted at the pneumo-allergology unit at Lomé Teaching Hospital.

METHODS

Our study took place at the pneumo-allergology unit of the pediatrics unit of Lomé Teaching Hospital. The study concerned all children, aged 0 to 18 years consulted in the pneumo-allergology unit of the Teaching Hospital during the period of study. We included in our work, children aged 0 to 18 years whom, after acceptance and realization of skin tests (prick tests) were sensitized to the cockroach. It was verified in these children that there were no contraindications to these tests (extensive dermatosis, history of anaphylactic accident) or recent medication that may interfere with results such as antihistamines, corticosteroids, codeine products or dermocorticoids. Prick test in our study consisted of pricking the skin through a drop of allergen extract. We used plastic needles (Stallerpoint). We performed control tests in order to control the skin reactivity (positive control) and to remove a dermatographism (negative control). Histamine hydrochloride 10 mg / ml was used for the positive control and a glycerin solution for the negative control. The location of each allergen was made shown with a ballpoint pen and we respected a safety distance of 2cm between the allergens and then we measured the diameter of the papules. The criterion of positivity is defined by induration diameter. A papule greater or equal to 3 mm compared to the negative control was considered positive.[2,3] Studied parameters were: Consultation reason, the period between signs onset and the consultation, the personal and family history of allergy, the hygiene in the domestic environment (cockroaches in the rooms, the use of traditional toilets and the lack of dishes immediately after meal), house characteristics (built more than 10 years ago, poorly ventilated and humid) examination and paraclinical examinations. The data analysis was done with Epi info version 6.04.

RESULT

During the period of study, 750 patients were consulted in the pneumo- allergology unit. Among them 693 were qualified for skin test (prick test). The number of people who had the skin test was 269 that is a frequency of 38.8% of skin tests realized. Over 269 people submitted to the test, 102 were sensitized to the cockroach. The frequency of cockroach sensitization was 37.9%. The mean age in our study was 8.8 years with extremes of 1 and 18 years. The distribution of patients about the age group showed a predominance of 5 to 10 years (35.3%). Over the 102 patients, the sex ratio was 1. Rhinitis was the most frequent reason of consultation in 39.2% of cases. Forty-four-

point one percent of patients (44.1%) had come to pneumo-allergology consultation one year and more after the first allergic episode.

Rhinitis was the most common personal history found in 48 (47%) patients, followed by 17 (16.6%) cases of asthma, endemic tropical limbo-conjunctivitis 13 (12.7%), Eczema 13 (12.7%), pruritus 10 (9.8%), urticaria 4 (3.9%), conjunctivitis 4 (3.9%), cough 4 (3.9%), prurigo 1 (0.9%), sinusitis 1 (0.9%). As for family histories, they were dominated by asthma 36 (35.3%), rhinitis 33 (32.3%), urticaria 10 (9.8%), eczema 5 (4.8%), pruritus 03 (2.9%), cough 2 (1.9%), sinusitis 2 (1.9%), endemic tropical limbo-conjunctivitis 1 (0.9%).

Siblings of patients were the most concerned with family histories' allergy 38 (37.2%), followed by mothers 18 (17.7%) and fathers 14 (13.8%). Old housings (built more than 10 years ago) predominated in 63.7%, were poorly ventilated (46.1%) and humid in 17.6% of cases. In seventy-eight-point four percent (78.4%) cases; meals were kept in the kitchen, 47.1% in refrigerators and 31.4% in the open air. Fifty-eight-point eight percent (58.8%) of our patients did not do the dishes immediately after meals. Twelve-point eight percent (12.8%) of our patients used traditional toilets. Predominant Clinical sign was large nasal cornets in (55.9%) cases (Table 1). Patients were polysensitized and 96.1% among them were sensitized to cockroaches and house dust mite (Table 2). Rhinitis was the most common diagnosis in 51% of cases, followed by eczema in 20.6% of cases and asthma in 18.6% of cases.

DISCUSSION

The frequency of skin test realization is 100% in some African countries. [4,5] This low frequency of skin test realization in our study (38.8%) would probably be related to the rareness of the test's allergens in Togo and their high cost at purchase; and by deduction, it increases the price of the test in our country and therefore financially inaccessible for a large number of Togolese.

The frequency of cockroach sensitization was high in our study (37.9%) as in Côte d'Ivoire (30.7%). [6] A study on cockroach hypersensitivity association with greater severity of chronic rhinosinusitis in the United States in 2017, found a frequency of 20.9% of cockroach sensitization. [7] This relatively high frequency of cockroach sensitization would probably be a consequence of the precariousness of habitats in our countries, which favors their proliferation. [6]

The prevalence of children aged 5 to 10 in our series could be explained by the fact that children in this age group spend much time at home and therefore have more contact with household allergens including cockroaches. [8]

The distribution of allergy in children by sex in general is variable. We found an equal sex distribution. An earlier study by a Togolese team had found a male predominance. [9] A female predominance was found in 2018 in New York. [10]

Table 1: Distribution of patients regarding physical appearance signs

	N	%
Thick nasal cornet	57	55,9
Nasal purulent discharge	50	49,0
Eczema	23	22,5
Conjunctivitis	22	21,6
Sibilants groan	21	20,6
Large tonsil	11	10,8
Bronchial groan	04	03,9
Urinary	02	01,9
Face edema	01	00,9
Prurigo	01	00,9

Table 2: Distribution of patients regarding physical appearance signs

	N	%
Cockroach and acarids	98	96,1
Cockroach and shrimp	60	58,8
Cockroach and crab	38	37,2
Cockroach, acarids and crevette	58	56,8

The consultation reason mostly depicted was rhinitis [11,12] as in this study. These results could be explained by the fact that rhinitis is the symptomatology that draws our attention more on allergy and therefore needs more consultation. However, it should be noted that patients who consulted for rhinitis often had a personal history of rhinitis and asthma as in this study. [13,14]

The period of consultation after the first allergic episode was greater than 1 year. The same result was revealed in a study in 2007 in Marrakech. [15] This too long period could be explained by patients' ignorance of allergic disease. Indeed, the latter will usually consult traditional doctors and unqualified health workers before getting to the specialist.

The high proportion of patients living in old houses in this work suggests that these houses promote the proliferation of cockroaches. Indeed, a work carried out in 2011, in France [16] evoked the impact of old housings on the release of allergic diseases, especially respiratory ones, and had found that 61.2% patients in their series were living in old housings.

Free lands are environment sources of insects' increase including cockroaches; and living close to undeveloped land would leads to the installation and maintenance of respiratory allergic diseases such as rhinitis and asthma in patients initially sensitized to pneumallergens such as cockroaches. Wild rubbish dumps, apart from their bad smells, dwelling close to wild rubbish dump can be a permanent source of smoke that

pollutes the air and favors the outbreak of allergic diseases. A study in Washington [17] showed that infants living on sites with polluted ambient air were more exposed to bronchiolitis than other infants living elsewhere.

Humid and poorly ventilated rooms are environments that favor the development of insects, especially cockroaches, and it brings about the occurrence of allergic diseases. [18,19] This study enables us to notice that 46.1% of our patients were living in poorly ventilated rooms and 17.6% of the rooms were humid. This is a key point in providing advice to these patients for prophylaxis.

The type of toilet used can be a source of cockroach proliferation. Indeed, traditional toilets are areas where cockroaches proliferate best leading to allergic diseases. Modern toilets are a comfort style that require pipework and waterproof septic tank. Septic tanks and cracked pipeworks and not waterproof constitute the source of the proliferation and development of cockroaches as well as in traditional toilets.

Storing food in the kitchen or in the refrigerator and the non-use of washing immediately dishes after meals or sweeping immediately food debris after meals, were widely observed practices in this study. Storing food in kitchens, especially incorporated, would enable the development of cockroaches which cause allergic diseases in rooms. Cockroaches' proliferation would also be eased in refrigerators containing food

and not having waterproof. The non-use of washing immediately dishes after meals or sweeping immediately food debris after meals would most often favor the development and proliferation of cockroaches and originate allergic pathologies.

The low level of our technical platform did not allow us to search for molecular allergens. However, we noticed that 96.1% of our patients were sensitized to cockroach and to house dust mite. The frequency of co-sensitization to cockroach and house dust mite has been highlighted by different authors. [1,6,20] The frequency of sensitization to both allergens would be essentially linked to a common cytoskeleton made of tropomyosin. The diagnosis most often reported was the moderate persistent rhinitis in 51% cases.[21]

Conflict of Interest

We declare no competing interests.

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