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Prevalence and Factors Associated of Papular Urticaria in Children Attended the Dermatologic Clinics at the Main State Hospitals in Sana'a City, Yemen, 2022

(A research submitted to the Faculty of Medicine & Health Sciences as a Graduation Requirement for obtaining a Bachelor's degree in Medicine)

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DEDICATION

This research is dedicated to our parents who have never failed to give us financial and more support, for meeting all our needs throughout our educational journeys and for teaching us that even the largest task can be accomplished is it is done one step at a time.

To our family members who believed in us more than we believed in ourselves.

To our friends who have been of much support and encouragement until this work was successfully done.

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List of contents

List of Tables

List of Figures

Abstract

Background:

Papular urticaria is an inflammatory disease manifested by chronic or recurrent papules caused by a hypersensitivity reaction to the bites of mosquitoes, fleas, bedbugs, and other insects. In Yemen, there is no known study about the prevalence of papular urticaria as well as, environmental or individual factors associated. Therefore, this study aimed to identify the factors associated with papular urticaria among children attending public hospitals in the capital city of Sana'a, Yemen.

Methods:

A cross sectional study was conducted during the period from November to December 2022, at the dermatology clinics of the main state hospitals in Sana'a city. The study used an exhaustive sampling method, and all children who suffer from skin rash were included in. Data collection was done by using an interviewer questionnaire and chart review checklist. Data analysis was performed by the SPSS program and different statistical procedures.

Results:

There is 6.7% of children attend to the dermatologic clinics in targeted hospitals have Papular urticaria. The study found that 60% of the patients were males and 40% were females. The proportion of patients aged between 2-5 years was 45%, while 55% were between 6-9 years.

Conclusions:

Papular urticaria is a common dermatological disease among children. The study recommends conducting a larger cross-sectional survey, raising awareness about the disease, regular maintenance of cleanliness, further research to explore the relationship between demographic variables and the factors causing papular urticaria in children, and providing better access to healthcare.

CHAPTER 1

Introduction
and
Literature review

Introduction

Papular Urticaria is an inflammatory disease manifested by chronic or recurrent papules caused by a hypersensitivity reaction to the bites of mosquitoes, fleas, bedbugs, and other insects (Steen, Carbonaro, & Schwartz, 2004).

It is seen primarily in children between 2 and 9 years of age, particularly in those with a history of atopic dermatitis. The disorder usually appears in late spring and summer (Blank, Shaffer, Spencer, & Marsh, 1950).

Papules may occur on any part of the body but tend to be grouped in clusters on exposed areas, particularly the extensor surfaces of the extremities (Sherman & Monroe, 1985).
Globally, the prevalence reported from Pakistan, Thailand, Tanzania are 1.99%, 2.3% and 5.6% respectively (Kiprono, Muchunu, & Masenga, 2015). In Nigeria, similar studies have been performed and showed 3.3% and 8.5% in 2005 and 2009 respectively (Ogunbiyi, Owoaje, & Ndahi, 2005). Papular Urticaria is common among children in tropical regions, it represents 2.4 to 16.3%, in Mexico City (Pozzo-Magaña, Rosa, Lazo-Langner, Gutiérrez-Castrellón, & Ruiz-Maldonado, 2012; Ruiz-Maldonado & Velázquez, 1977), 4.4% in Mali (Mahé, Cissé, & Faye, 1998) and 5.2% in India (Karthikeyan, Thappa, & Jeevankumar, 2004; Sacchidanand, Sahana, Asha, & Shilpa, 2014a). There was 14.6% of children attended to the dermatologic clinics in Nigeria in 2008 had Papular Urticaria (Altraide, George, & Frank-Briggs, 2008).

In Mediterrean Region,a study has been performed on 6162 school age children in 30 schools in Egypt reported prevalence 4.4% of papular urticaria (El‐Khateeb, Lotfi, Abdel‐Aziz, & El‐Shiekh, 2014).

In Yemen -to the best of our knowledge- there is no study about the prevalence of Papular Urticaria or to identify any associated environmental or individual factors. So, this study foucsed on prevalence of papular urticaria in Dermatology outpatient's department clinics of Al-Gomhori &Al-Thowrah state hospitals at Sana'a city during the period from 13 November to 30 December 2022.

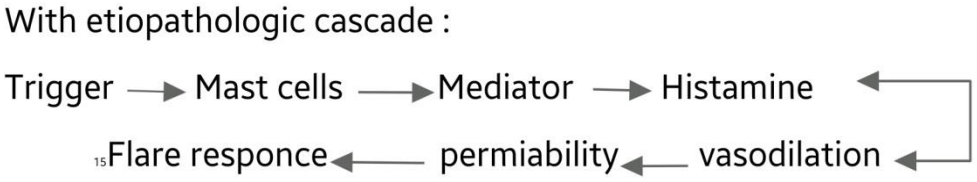
Literature Review:

In general, Urticaria is a common eruption characterized by transient, usually pruritic wheals & heaves (papules and plaques due to acute dermal edema from extravascular leakage of plasma). It's the most cutaneous disease treated at ER, 15-20% of people tend to have urticaria in their life.

Acute urticaria is more common in young and children wherease chronic urticaria tends to be commoner in adults.

When the swelling is superficial within the dermis, pruritic wheals appear, whereas when deep, angioedema is seen. Urticaria may be spontaneous or inducible, as well as acute or chronic. Acute spontaneous urticaria can have an allergic basis, but chronic spontaneous urticaria (CSU) usually does not. Many cases remain with unexplained causes i.e. idiopathic, Nonsteroidal anti-inflammatory drugs, foods, alcohol, stress, and infections (Kirkham, 1990).

The primary effector cell of urticaria is the mast cell and release histamine which is the major mediator of pruritus and wheals (Browning, 2018).



papular urticaria also known as lichen urticatus, it is a branch of urticaria which occurs mostly in infancy and childhood, originally described in 1813 by Bateman.

It is hypersensitivity reaction type l &IV ,occurs due to insect bites of either Arachnida (spiders, scorpions, ticks, and mites) or the Insects (lice, fleas, bedbugs, flies, bees, and ants) (Steen et al., 2004).

Besides the use of mattresses without springs, daily use of public transportation, having a soil or earth floor in the main bedroom, siblings with a history of atopic dermatitis, absence of sewage

system and presence of animal contact as a risk factors (Sacchidanand, Sahana, Asha, & Shilpa, 2014b).

It consists of small, pruritic, urticarial papules. Individual lesions are seen as 3-to-10mm, firm urticated papules, often with a central punctum, they may be excoriated, lichenified, or secondarily infected with crust formation (Shaffer, Jacobson, & Beerman, 1954).

Papules typically cluster on the extensor sides of extremities and the non-stocking part. Most lesions persist for 2-10 days and, after resolution, may result in temporary post inflammatory erythema or pigmentation, occasionally they may persist into adolescence or adulthood (Hurwitz, 1993).

Histologic features of typical papular urticaria can be classified into 4 variants: lymphocytic, eosinophilic, neutrophilic, and mixed cellular, a localized perivascular infiltrate with lymphocytes, histiocytes, eosinophils, and mast cells in the upper dermis; variable edema between collagen fibers; and a light scattering of eosinophils and mast cells away from vessels in the upper and mid dermis are evident. Spongiosis with exocytosis and vesicle formation is present in the epidermis, overlying the most marked and superficial perivascular infiltrate.

In older excoriated papules, the histologic changes are usually modified by the effects of scratching. In addition, the development of epidermal necrosis, crusting, and a dermal infiltrate with neutrophils and more abundant lymphocytes make histologic diagnosis more difficult (Kirkham, 1990; Lever, Schaumburg-Lever, & Gottlieb, 1984).

Papular urticaria may be a hematogenous disseminated antigen deposited by an arthropod bite to a sensitive patient. This presumably explains why papular urticaria rarely occurs in neonates.

Most infants are not sufficiently exposed to biting insects to develop hypersensitivity. Experiments have shown that with repeated exposure to antigen, hyposensitzation takes place, and the child “outgrows” the condition (Steen et al., 2004).

Papular Urticaria is firstly managed by elimination of the insects to which the child may be exposed, especially cat and dog fleas, human fleas and bed bugs. The sleeping quarters of the pets should be thoroughly treated with insecticides. The baseboards, corners, rugs and furniture in all the rooms of the home should be treated with insect sprays twice weekly and after any

visitors came to home , then cleaning it well by vacuum cleaner to remove all died insects and their eggs (Kirkham, 1990).

H1 antihistamines are the primary treatment of urticaria. Oral corticosteroids should only be used when rescue therapy is required. Immunosuppressive or omalizumab (anti-IgE antibody)are third-line options for H1 antihistamine-refractory chronic spontaneous urticaria (Browning, 2018).

Previous Studies:

Several studies are performed elsewhere about Papular Urticaria such as:

Study by Jordaan & Schneider on 1997 has been done to reveal that morphologic and immunohistochemical with histopathologic differential diagnosis of papular urticaria includes other spongiotic dermatitis, pityriasis lichenoid et varioliformis acuta, the pruritic papular eruption of human immunodeficiency virus disease, and papulonecrotic tuberculid and shows that papular urticaria with marked spongiosis and a dense inflammatory cell infiltrate cannot be reliably distinguished from arthropod bites on clinical and histopathologic ground also the evidence of type I hypersensitivity reaction plays a central role in the pathogenesis of papular urticaria.

Although a study by (Cuéllar, García, Rodríguez, Halpert,3&Gómez, 2007) has been described in infants as young as 2 weeks. These papules may appear to a lesser extent on the face and neck, trunk, thighs, and buttocks and generally spare the genital, perianal, and axillary.

Another Clinical study of papular urticaria was performed to determine the clinical features and demographic profile of the patients having papular urticaria, and it shows that children, adult males, non-locals and those belonging to urban/peri-urban areas are more vulnerable to papular urticaria in a particular region. papular and urticarial lesions arranged in groups over both exposed as well as covered body parts of a single patient is the most common clinical pattern (Raza, Lodhi, Ahmed, Dar, & Ali, 2008).

Also, a study of prevalence and risk factors of urticaria with a focus on chronic urticaria in children, shown that an acute urticaria was significantly associated with allergic diseases and parental history of allergy but chronic urticaria was not associated with these clinical factors (Lee et al., 2017).

Aims of the study

General objectives:

To determine the prevalence of papular urticaria in children attended the dermatologic clinic at the main state hospitals in Sana'a city, Yemen.

Specific objectives:

- To describe the sociodemographic characteristics of the study participants.
- To identify the most common factors associated with papular urticaria in children.

CHAPTER 2

Materials and Methods

Materials and Methods

Study design:

A cross-sectional study was performed in children attending the dermatology clinics at the main public hospitals in Sana'a city, Yemen, the period from November to December 2022.

Sample Size and Sampling:

Exhaustive sampling method was used in this study where all children suffering from skin rash and attending to dermatology clinic at the main public hospitals of Sana'a city met the inclusion criteria during the study period in this study.

Process of sample collection: -

The process of sample collection for our study involves several steps.

First, we take a full history of the patient and ensure that they meet the inclusion criteria for our study.

Next, children undergo a dermatological examination by dermatologist.

This allows us to gather comprehensive data on the patient condition and ensure accurate diagnosis and analysis.

Data collection and management:

Interviewer questionnaire and checklist for chart review were used for data collection. Data collected by the researchers with the help of doctors working in dermatology clinics in the hospitals.

Data analysis:

Data is analyzed is by introducing the entire variable and the results of the subjects into to SPSS version 24 to be analyzed and is done by using different statistical procedures depending upon the types of variables that are used and we Presented the data by using the statistical tables and graphs.

Study variables:

They include the following**:**

Domestic animals associated with housing household (dogs, cats, rabbits and others), rodents (rats or mice at home or around the house), public services (Aqueduct, sewerage and garbage collection), housing characteristics (flooring material: wood, carpet, tile, cement or soil/earth in the different parts of the house such as bedroom, living room, kitchen and others; house or apartment; numbers of bedroom, adjacent house and others), mattress material (springs), presence of fleas in housing, type of transportation and personal history or family history of asthma, allergic rhinitis, atopic dermatitis and papular urticaria.

Inclusion criteria:

Children with more than 1-years-old, who suffering from skin rash and attending to dermatology clinic during the study period.

Exclusion Criteria:

Children with less than 1-year-old of residence with concomitant diseases such as malignancies, extensive active atopic dermatitis, and active systemic infection was excluded.

CHAPTER 3

Results

Results

6.7% of children attended to the dermatologic clinics in targeted hospitals have papular urticaria.

A total of 20 children diagnosed with popular urticaria ,12 (60 %) males and 8 (40%) females, respectively, were included in this study. Overall response rate is 100.0 percent. The children response age group is 9 (45%) they are in between 2- 5 years of age.11 (55%) of children age group are 6-9 years of age.

The sample of the children were taken from two hospitals, specifically 50% from AL-Gomhoari Hospital and 50% from Al-Thawrah Hospital

The majority of children with papular urticaria who attended dermatology clinics at the main public hospitals Sana'a were from the urban area, accounting for 60% of the total sample. This was followed by children from the peri-urban of Sanaa and rural areas, accounting for 40%. These proportions are considered normal as most of the children in the study sample are expected to be from the city of Sanaa.

The majority of affected children had a medium socioeconomic status with a percentage of 65%, followed by those with poor socioeconomic status at 30%.

Only 5% of the affected children belonged to the high socioeconomic status group. as shown in table (3.1).

Table 3.1: Percentages and Frequencies of Demographic Characteristics related to Children diagnosed with Papular Urticaria

Variable	demographic characteristics	Frequency	Percent (%)
Name of hospital	AL-Gomhoari	10	50%
	AL-Thawra	10	50%
Age	2-5 Years	9	45%
	6-9 Years	11	55%
Gender	Male	12	60%
	Female	8	40%
Residency	Urban	12	60%
	Peri-Urban	4	20%
	Rural	4	20%
Socioeconomic status	High	1	5%
	Medium	13	65%
	Poor	6	30%
Number of people living with	1-4	10	50%
	more than 4	10	50%
Total		20	100%

To investigate whether there is a correlation and association between demographic variables, cross-tabulation tables and a chi-square test were performed. Data from Table 3.2 shows that the majority of patients were males aged between 6-9 years, with a total of 7 patients. The number of male and female patients in both age groups was similar. Most patients were from peri-urban areas, aged between 2-5 years, and belonged to families with moderate income, aged between 6-9 years. However, the results did not indicate a statistically significant correlation between the age of the patients and gender, place of residence, socioeconomic Status of the family, or number of people living with.

Table 3.2: Association of Papular Urticaria with Demographic Characteristics of Children according to age Group

demographic characteristics		Age		Chi-Square	p-value
		2--5	6--9		
Gender	male	5	7	0.135	0.71
	female	4	4		
Residency	urban	7	5	4.175084	0.124
	Peri-urban	0	4		
	Rural	2	2		
Socioeconomic status	Poor	3	3	1.51	0.47
	Medium	5	8		
	High	1	0		
Number of People living with	≤ 4	5	5	0.202	0.65
	> 4	4	6		

The results of table (3.3) also shows that most of the male or female patients were either urban residents or from families with middle socioeconomic status. However, the significance level value indicates that the relationship between the gender of patients and each of (place of residence, economic status of the family, and the number of individuals living with the patient) is not statistically significant, indicating no correlation between these variables.

Table 3.3: Association of Papular Urticaria with Demographic Characteristics of Children according to Gender

demographic characteristics		Gender		Chi-Square	p-value
		male	female		
Residency	urban	6	6	3.33	0.189
	Peri-urban	4	0		
	Rural	2	2		
Socioeconomic status	Poor	5	1	3.066	0.216
	Medium	6	7		
	High	1	0		
Number of People living with	≤ 4	8	2	3.33	0.068
	> 4	4	6		

The data in table 3.4 shows that most of the patients who live in the capital Sana'a or its outskirts or in rural areas come from families with a middle income. However, there was no statistically significant relationship between the patient's place of residence and either the economic status of their family or the number of people living with them, as the level of significance was greater than 0.05.

Table 3.4: Association of Papular Urticaria with Demographic characteristics of Children according to Place of Residence

demographic characteristics			Residency			Chi-Square	p-value
			urban	Peri-urban	Rural		
Socioeconomic status	Poor		5	1	0	3.67	0.45
	Medium		6	3	4		
	High		1	0	0		
Number of People living with	≤ 4		6	3	1	2.00	0.368
	> 4		6	1	3		

There was no statistically significant relationship between the socioeconomic status of the patient's family and the number of individuals living with the patient, as shown in table (3.5).

Table 3.5: Association of Papular Urticaria with Number of People living with according to Socioeconomic Status

demographic characteristics			Socioeconomic status			Chi-Square	p-value
			Poor	Medium	High		
Number of People living with	≤ 4		3	6	1	1.08	0.58
	> 4		3	7	0		

The Factors Associated with Papular Urticaria:

Based on the data in figure (3.1), it appears that the majority of children with Papular Urticaria who visit dermatology clinics in the main public hospitals in the capital Sana'a have arthropods in their homes, with a percentage of 80%, while 20% of the sick children do not have arthropods in their homes. 45% of family members of the sick children usually get bitten, while 55% have not been bitten. Only 10% of the relatives of children with Papular Urticaria were affected by atopic dermatitis, while the majority (90%) of their relatives were not affected by atopic dermatitis. Furthermore, there is a sewerage system in the homes of children with Papular Urticaria

who visit dermatology clinics in the main public hospitals in the capital Sana'a, with a percentage of 80%. This percentage indicates that the availability of a sewerage system is not related to the incidence of Papular Urticaria in children, but the sewerage system may not meet the required health specifications or may not be maintained regularly, or other factors such as cleanliness, etc.

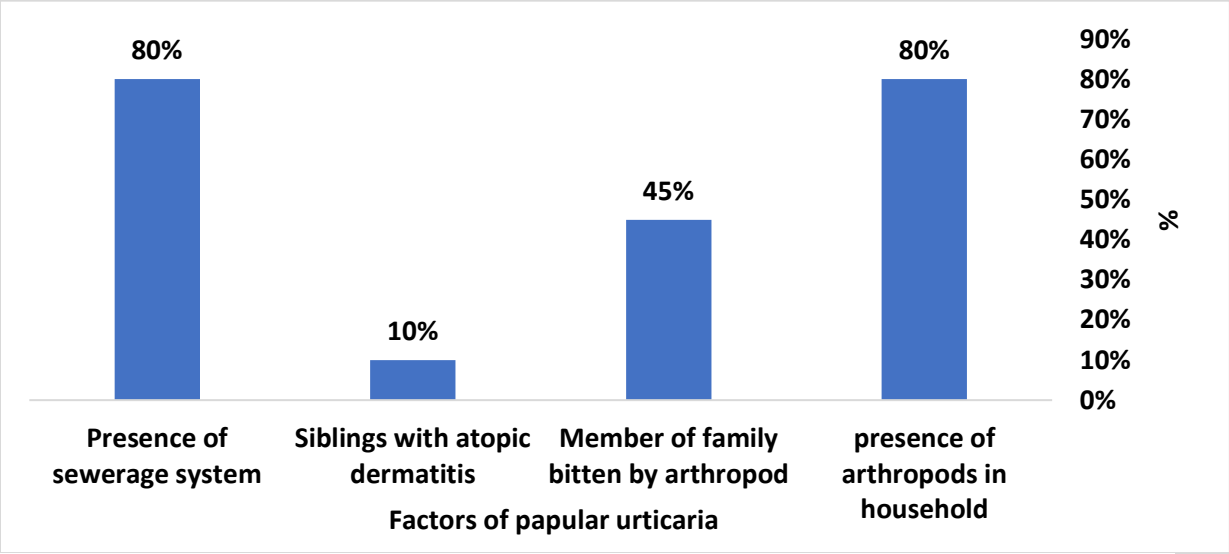


Figure 3.1: Factors associated with Papular Urticaria among Affected Children in Sana'a

To determine whether there are differences or correlation relationships between demographic characteristics and factors related to the incidence of papular Urticaria in children, the frequencies and chi-square coefficients were extracted at a significance level of 0.05 for each factor, as shown in Table (3.6).

It is evident from table (3.6) that there are statistically significant differences in the degree of atopic dermatitis among individuals from children's households, depending on their place of residence, where the chi-square value was 8.88 and the significance level was 0.011, which is less than 0.05. Most of the patients with atopic dermatitis were from households with papular urticaria

who live in urban areas, and the reason may be that most patients who visit public hospitals in Sana'a are from urban areas due to their proximity. Additionally, statistically significant differences and a correlation were found between the socioeconomic status of households with Papular Urticaria and the presence of a sanitary system in the homes of children with papular urticaria who visit dermatology clinics in major public hospitals in the capital, Sana'a

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Table 3.6: Distribution of Factors related to Papular Urticaria according to Children's Demographic Variables.

		Siblings with atopic dermatitis			
Demographic characteristics		**No**	**yes**	**Chi-Square**	**P-value**
Gender	**Male**	**11**	**1**	**0.092**	**0.76**
	Female	**7**	**1**		
Age	**2-5**	**7**	**2**	**2.716**	**0.099**
	6-9	**11**	**0**		
Residency	**urban**	**12**	**0**	**8.888**	**0.011**
	Peri-urban	**4**	**0**		
	Rural	**2**	**2**		
Socioeconomic status	**Poor**	**6**	**0**	**1.196**	**0.549**
	Medium	**11**	**2**		
	High	**1**	**0**		
		Presence of Sewerage system			
		No	**yes**	**Chi-Square**	**P-value**
Gender	**Male**	**3**	**9**	**0.46**	**0.49**
	Female	**1**	**7**		
Age	**2-5**	**3**	**6**	**1.81**	**0.177**
	6-9	**1**	**10**		
Residency	**urban**	**4**	**8**	**3.33**	**0.188**
	Peri-urban	**0**	**4**		
	Rural	**0**	**4**		
socioeconomic status	**Poor**	**4**	**2**	**11.67**	**0.003**
	Medium	**0**	**13**		
	High	**0**	**1**		

However, the results of the binary logistic analysis in Table (3.7) did not show any significant effects or differences in the previous variables on the availability of factors related to the spread of papular urticaria among children infected with the disease.

The results indicate that male children with papular urticaria who have siblings with atopic dermatitis have a lower incidence than female children with papular urticaria who have siblings

with atopic dermatitis. This means that the probability of females being affected by papular urticaria is greater than males when they have siblings with atopic dermatitis with a odds ratio of 1.571 and a 95% confidence interval of (0.084-29.41). However, this association and effect was not statistically significant as the p-value was 0.762, which is greater than 0.05. Similarly, for the risk factor related to the presence of sewage systems, it had no effect on the gender of children affected by papular urticaria. The results also indicate no significant impact of the other variables on the probability of increased risk factors and their effect on children with different demographic variables.

Table 3.7: Logistic Regression Analysis to Identify the Impact of Risk Factors According to Demographic Variables.

Demographic characteristics		Siblings with atopic dermatitis				Presence of Sewerage system			
		OR	95% CI		P-value	OR	95% CI		P-value
			Lower	Upper			Lower	Upper	
Gender	male	1.571	.084	29.409	0.762	2.333	.197	27.567	0.50
	Female	Ref				Ref			
Age	2-5	461564259.8	.000	.	.999	.200	.017	2.386	0.203
	6-9	Ref				Ref			
Residence	urban	.000	.000	.	0.999	.000	.000	.	0.999
	Peri-urban	.000	.000	.	0.999	1.000	.000	.	1.00
	Rural	1.000	.000	.	1.00	Ref			
Socioeconomic status	Poor	293722719.0	.000	.	1.00	.000	.000	.	1.00
	Medium	1.000	.000	.	1.00	1.000	.000	.	1.00
	High	Ref							
The reference category is: yes									

Clinical Results:

Clinical results as shown in table 3.8 revealed that 80% of patients with Papular Urticaria had experienced similar attacks, while 20% did not. 65% were bitten by anthropods only twice, while 35% were bitten three times or more. The vast majority of children with papular urticaria, who visited dermatology clinics in the main public hospitals in the capital Sana'a, showed signs of bites in exposed areas of their bodies, with a percentage of 95%. 75% of the children showed signs of bites on the ventral surface, while 25% showed signs on the constricting band. 20% of the children showed bites in generalized areas. 15% of the children were found to have allergies, asthma, or both, while 85% had no symptoms.

Table 3.8: Clinical Data of Children with Papular Urticaria

Clinical data		Frequency	Percent
Similar attacks	Yes	16	80%
	No	4	20%
Number of attacks	Two times	13	65%
	Three or more	7	35%
Exposed area	Yes	19	95%
	No	1	5%
Ventral surface	Yes	15	75%
	No	5	25%
Constricting band	Yes	5	25%
	No	15	75%
Generalized	Yes	4	20%
	No	16	80%
Is there any allergies or asthma?	None	17	85%
	Yes, there is allergies	1	5%
	Yes there is asthma	1	5%
	Yes there is both	1	5%

The clinical results of the affected children showed that 45% of them were not diagnosed with any associated disease, 15% were diagnosed with atopic dermatitis, 15% were unidentified, while one case was diagnosed with warts, one case with xerosis, one case with asthma, one case with IBR, and one case with T. capitis. See table (3.9).

Table 3.9: Characteristic of Sample per Associate Clinical Disease, in the General Hospitals in Sana'a

Associate clinical disease	Frequency	Percent
Asthma	1	5%
Atopic dermatitis	3	15%
IBR	1	5%
Non	9	45%
T.capitis	1	5%
Unknown	3	15%
Warts	1	5%
Xerossis	1	5%
Total	20	100%

To identify the differences in the degree of clinical results variation among patients, the frequencies and chi-square for each variable were extracted as shown in table 3.10.

The results in table 3.10 shows that male children with papular urticaria who had similar attacks were 9, representing 75% of the total males, while female children with papular urticaria were 7, representing 87.5% of the total females, indicating apparent differences in the degree of similar attacks, with females being more exposed. However, the chi-square value and significance level did not show statistically significant differences, where the significance level was 0.178, which is greater than the significant level of 0.05. The highest percentage of children who had similar attacks were in the age group of 6-9, reaching 91% of the total number of children in this group. The result did not show significant differences attributed to the age variable, and no statistically significant differences were observed in similar attacks attributed to the variables of residence and economic status of the families of children with papular urticaria who visited public hospitals in Sana'a.

Regarding the number of attacks, there was a statistically significant relationship between the number of stings that a child with papular urticaria is exposed to and the age variable. However, there was no statistically significant relationship between gender, place of residence, and socioeconomic status and the number of attacks that the sick child is exposed to.

Table 3.10: Differences in Clinical Results based on Demographic Variables among Children with Papular Urticaria in Sana'

Clinical Data \ Demographic characteristics		Age		Gender		Residency			socioeconomic status		
		6 — 9	2-- 5	female	male	Rural	Peri-urban	urban	High	Medium	Poor
Similar attacks	No	1	3	1	3	0	0	4	0	1	3
	Yes	10	6	7	9	4	4	8	1	12	3
P-value		0.178		0.49		0.189			0.088		
Number of attacks	two times	5	8	6	7	3	2	8	0	9	4
	Three or more	6	1	2	5	1	2	4	1	4	2
P-value		0.043		0.444		0.746			0.374		
Exposed area	No	1	0	0	1	0	0	1	0	0	1
	Yes	10	9	8	11	4	4	11	1	13	5
P-value		0.353		0.40		0.704			0.292		
Ventral surface	No	2	3	2	3	0	0	5	0	1	4
	Yes	9	6	6	9	4	4	7	1	12	2
P-value		0.436		1.00		0.108			0.019		
Constricting band	No	9	6	5	10	1	4	10	1	8	6
	Yes	2	3	3	2	3	0	2	0	5	0
P-value		0.436		0.29		0.028			0.166		
Generalized	No	8	8	8	8	2	2	12	1	10	5
	Yes	3	1	0	4	2	2	0	0	3	1
P-value		0.368		0.068		0.024			0.83		
Is there any allergies or asthma?	No	9	8	6	11	3	4	10	1	10	6
	asthma	0	1	0	1	1	0	0	0	1	0
	allergies	1	0	1	0	0	0	1	0	1	0
	both	1	0	1	0	0	0	1	0	1	0
P-value		0.409		0.281		0.48			0.92		

Regarding the areas where children are exposed to bites from arthropods with legs, there was a statistically significant relationship between ventral surface and the economic status variable, and between constricting band and generalized variables and the place of residence variable. However, there was no statistically significant relationship between the exposed area and all demographic variables of children with papular urticaria in Sana'a.

The logistic analysis showed that the likelihood of children being exposed to three or more anthropad bites increases with age, while the likelihood is higher for children with papular urticaria who are younger. However, this effect is not statistically significant, meaning that there is no statistically significant effect of age on the number and similarity of attacks, as well as for other variables that did not show a clear and significant effect on the relationship between them and children's exposure to attacks. table 3.11 shows this.

Table 3.11: Logistic Analysis to Identify the Effect of Risk Factors on Different Demographic Variables.

Demographic characteristics		Number of attacks				Similar attacks			
		OR	95% CI		P-value	OR	95% CI		P-value
			Lower	Upper			Lower	Upper	
Gender	male	.467	.065	3.344	.448	2.333	.197	27.567	.501
	Female	Ref				Ref			
Age	2-5	9.600	.876	105.166	0.064	.200	.017	2.386	.203
	6-9	Ref							
	urban	1.500	.116	19.437	.756	0.00	0.00		.999
	Peri-urban	3.000	.150	59.890	.472	1.00	0.00		1.000
	rural	Ref							

The results also showed an effect that approaches statistical significance of the appearance of Papular Urticaria signs and anthropad bites in the constricting band, depending on the place of residence, as shown in table 3.12.

Table 3.12: Logistic Regression Analysis and Odds Ratios were used to Assess the Effect of Residence on the Areas of Papular Urticaria Lesions Appearance.

Clinical Data / Demographic Characteristics		Constricting band			
		OR	95% CI		P-value
			Lower	Upper	
residence	urban				
	Peri-urban	15.000	.983	228.896	0.051
	rural	.000	.000		0.999

The logistic regression analysis and odds ratios revealed a higher likelihood of lesions of Papular Urticaria appearing in constricting bands, such as socks and waistbands, among residents of the outskirts of Sana'a city compared to children residing in the city center. However, there were no significant differences or effects on patients from rural areas. The logistic regression analysis did not reveal any significant variables or differences that could be a risk factor for an increased likelihood of Papular Urticaria resulting from bites. The study also attempted to investigate the

relationship between the causative agents discussed in the study and clinical outcomes. The results of the bivariate and multivariate logistic regression analysis revealed no significant effect, indicating no correlation between the pathological factors that may cause Papular Urticaria and the clinical outcomes that were diagnosed. Nevertheless, a statistically significant relationship was observed between the presence of siblings with atopic dermatitis and the presence of lesions of Papular Urticaria in constricting bands among children with Papular Urticaria (table 3.13).

Table 3.13: The Relationship between Siblings with Atopic Dermatitis and Constricting Bands among Children with Papular Urticaria

Clinical data / Factor Associated		Constricting band		Total	Chi-Square	P-value
		No	Yes			
Siblings with atopic dermatitis	No	15	3	18	6.667[a]	0.010
	Yes	0	2	2		
Total		15	5	20		

There was also a statistically significant relationship between the presence of siblings with atopic dermatitis and the occurrence of allergy or asthma in children with papular urticaria, as shown in table (3.14).

Table 3.14: The Relationship between the Presence of Siblings with Atopic Dermatitis and the Presence of Allergies or Asthma in Children with Papular Urticaria

Clinical data / Factor Associated		Is there any allergies or asthma?				Total	6.667[a]	0.010
		No	Yes, there is asthma	Yes, there is allergies	Yes, there are both			
Siblings with atopic dermatitis	No	16	0	1	1	18	9.542[a]	0.023
	Yes	1	1	0	0	2		
Total		17	1	1	1	20		

However, it is not possible to conclusively determine the existence of this relationship, as the sample size was small. Only two cases showed symptoms of asthma or allergies while having siblings with atopic dermatitis, and there was only one case with asthma and allergies without any siblings with atopic dermatitis.

CHAPTER 4

Discussions

Discussion

In this study, a sample of children with Papular Urticaria was studied and diagnosed, and factors associated with the disease were identified by examining differences in the prevalence of the disease among children with Papular Urticaria who attended public hospitals in the capital Sana'a, Yemen, according to their demographic characteristics. The study found that 60% of the patients were male and 40% were female. The proportion of patients aged between 2-5 years was 45%, while 55% were aged between 6-9 years. Most of the patients were from Amanat Al-Asimah (Sanaa), accounting for 60% of the sample. This can be attributed to the fact that the hospitals where the samples were taken from were located within the city (urban), while the proportion was lower for those from the outskirts of the city (peri-urban) and rural areas. Most of the study sample's families had a middle income, which contradicts the results of a study by (Halpert et al., 2017), which found that most patients with papular urticaria came from low-income families.

The study found that only 10% of siblings of children with papular urticaria in Sana'a (the capital city) had atopic dermatitis. Additionally, the availability of sewage systems was relatively high at 80%, indicating that these factors are not significantly associated with the spread of papular urticaria among children in Amanat Al-Asimah. The reason for this could be attributed to the lack of regular maintenance and attention to cleanliness, among other factors, that make the absence of a sewage system a risk factor for disease spread.

The study also found no significant correlation between the demographic variables of the patients, as they were all independent variables, except for a more detailed analysis of the sample distribution through contingency tables and descriptive figures to describe the sample of Papular Urticaria patients. Furthermore, the study did not show any significant effect of the studied variables on the factors causing papular urticaria, despite a statistically significant relationship between some variables such as place of residence or the economic level of the patient's family, as shown by the odds ratio in the logistic regression analysis. This may be due to the insufficient sample size of the study to demonstrate these effects and factors. These findings differ from a study by (Halpert et al., 2017), which found that socioeconomic status is a risk factor for Papular Urticaria in children. Additionally, the differences in findings may be due to the fact that their study included both affected and unaffected samples, unlike the current study which only included affected samples.

Regarding the clinical results, 80% of the children had experienced similar attacks, some of whom had been stung twice, with a percentage of 65%, and 35% had been stung three times or more. The most affected areas of the children were the exposed areas, with a percentage of 95%, which is expected as these are the areas most exposed to anthropods with legs.

The results did not show any differences in gender in the clinical results, which is similar to the study conducted by (Na'im Rida, 2006) and many other studies that concluded that the most affected areas are the exposed areas.

The study found statistically significant differences in the quality of lesions of papular urticaria on constricting bands based on the location of residence. The reason for this difference may be due to variations in clothing between urban and rural children. However, the lack of a larger sample of children from hospitals, public and private facilities in different regions to study these effects could also be a contributing factor.

The results showed that the vast majority of children with Papular Urticaria did not suffer from asthma or nasal allergies (85%), indicating that this factor is not a significant risk for children. This finding contradicts a study by (Halpert et al., 2017), which found a high percentage of children with nasal allergies.

The current study recommends conducting a larger cross-sectional survey and collecting different samples and responses from all patients with dermatological diseases. This will help determine the extent of the spread of this disease and identify the main risk factors for developing papular urticaria.

CHAPTER 5

Conclusions And Recommendations

Conclusions

In conclusion, this study aimed to identify the factors associated with Papular Urticaria among children attending public hospitals in the Sana'a city, Yemen. The study found that most of the patients were male, aged between 2-9 years, and from (Sana'a), with a middle income. The study did not show any significant correlation between the demographic variables of the patients, except for a more detailed analysis of the sample distribution. Additionally, the study found that atopic dermatitis and the availability of sewage systems were not significantly associated with the spread of papular urticaria. The clinical results showed that the most affected areas of the children were the exposed areas, and there were statistically significant differences in the quality of lesions of Papular Urticaria on constricting bands based on the location of residence. The study also found that the vast majority of children with Papular Urticaria did not suffer from asthma or nasal allergies. The study recommends conducting a larger cross-sectional survey and collecting different samples and responses from all patients with dermatological diseases to determine the extent of the spread of this disease and identify the main risk factors for developing papular urticaria.

Recommendations

1. Raising awareness: The study emphasizes the importance of raising awareness about the disease among parents, healthcare providers, and the public in general. This will help in early detection and timely treatment of the disease.

2. Regular maintenance of cleanliness: As the study highlights that the absence of a sewage system is a risk factor for the disease spread, it is recommended to improve the sanitation system and to ensure the regular maintenance of cleanliness to prevent the spread of the disease.

3. Further research: The study findings suggest the need for further research to explore the relationship between demographic variables and the factors causing Papular Urticaria in children. This can provide insights into the potential risk factors for the disease and help in the development of effective prevention and treatment strategies.

4. Providing better access to healthcare: It is recommended to provide better access to healthcare for children with papular urticaria, particularly in the peri-urban and rural

areas. This will help in early diagnosis and treatment of the disease, and prevent further complications.

5. Conducting a larger cross-sectional survey: The current study recommends conducting a larger cross-sectional survey with a wider sample size of children from different regions to study the prevalence of papular urticaria in children and identify the main risk factors for developing the disease.

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Appendixes

Appendixe (1):
Questionnaire form

Questionnaire:

We are a group of medical student in the fifth year participate in research that will be supervised by (ASSOC PROF DR. Sahar Alaudi and DR. Khaled Al-Jamrah) . This research is about determining the Prevalence and factors associated of Papular urticaria in children attended the pediatric clinic at Al. hospital, Sana'a city, Yemen, 2022

Demographics

Hospital name	
Patient name	
Date	
Age	
Gender	☐ Female ☐ Male
Residence	☐ Urban ☐ Peri-urban ☐ Rural
Socioeconomic status	☐ High income ☐ Moderate income ☐ Poor income
Number of people living with	☐ 1 to 4 ☐ 5 or more

Factor associated

Presence of Arthropods in household	☐ Yes ☐ No
Type of Arthropods	☐ Fleas ☐ Mosquito ☐ others…

Members of the family usually bitten by Arthropods	☐ Yes ☐ No
Siblings with atopic dermatitis	☐ Yes ☐ No
Presence of Sewerage system	☐ Yes ☐ No

Clinical data

Diagnosis	
Duration of illness	
Similar attacks	☐ Yes ☐ No
Number of attacks	☐ two times ☐ Three or more
Exposed area	☐ Yes ☐ No
Ventral surface	☐ Yes ☐ No
Constricting band	☐ Yes ☐ No
Generalized	☐ Yes ☐ No
Is there any allergies or asthma?	☐ Yes, there is asthma ☐ Yes, there is allergies ☐ Yes, there are both ☐ No
Associated clinical disease	

Arabic Summary

الملخص العربي

الخلفية: الشرى الحطاطي هو مرض التهابي يتجلى في حطاطات مزمنة أو متكررة ناتجة عن تفاعل فرط الحساسية لدغات البعوض والبراغيث والبق والحشرات الأخرى. في اليمن، لا توجد دراسة تحدد مدى انتشار الشرى الحطاطي أو العوامل البيئية أو الفردية المرتبطة به. لذلك هدفت هذه الدراسة إلى التعرف على العوامل المرتبطة بالشرى الحطاطي لدى الأطفال الذين يترددون على المستشفيات العامة في العاصمة صنعاء.

المنهجية:

أجريت دراسة مقطعية في الفترة من أكتوبر إلى ديسمبر ٢٠٢٢ في عيادة الأمراض الجلدية في المستشفيات العامة الرئيسية في صنعاء. استخدمت الدراسة طريقة شاملة لأخذ العينات، وتم استهداف جميع الأطفال الذين يعانون من الطفح الجلدي ويستوفون معايير الاشتمال. تم جمع البيانات باستخدام استبيان المحاور وقائمة المراجعة. تم إجراء تحليل البيانات باستخدام برنامج SPSS والإجراءات الإحصائية المختلفة.

النتائج:

هناك ٦,٧٪ من الأطفال الذين يذهبون إلى عيادات الأمراض الجلدية في المستشفيات المستهدفة لديهم شرى حطاطي. ووجدت الدراسة أن ٦٠٪ من المرضى كانوا من الذكور و٤٠٪ من الإناث. كانت نسبة المرضى الذين تتراوح أعمارهم بين ٢-٥ سنوات ٤٥٪، بينما ٥٥٪ تتراوح أعمارهم بين ٦-٩ سنوات. كان معظم المرضى من أمانة العاصمة (صنعاء بنسبة ٦٠٪ من العينة) ، و ١٠٪ فقط من أشقاء الأطفال المصابين بالشرى الحطاطي في أمانة العاصمة (العاصمة) يعانون من التهاب الجلد التأتبي. كانت أنظمة الصرف الصحي مرتفعة نسبيًا حيث بلغت ٨٠٪، مما يشير إلى أن هذه العوامل لا ترتبط ارتباطًا وثيقًا بانتشار الشرى الحطاطي بين الأطفال في أمانة العاصمة، وقد تعرض ٨٠٪ من الأطفال لهجمات مماثلة، بعضهم تعرض للسع مرتين، مع نسبة ٦٥٪ و٣٥٪ تعرضوا للسع ثلاث مرات أو أكثر وكانت أكثر المناطق تضررا من الأطفال هي المناطق المعرضة بنسبة ٩٥٪ والمتوقعة حيث أن هذه هي المناطق الأكثر تعرضا للأنثروبودات ذات الأرجل. الغالبية العظمى من الأطفال المصابين بالشرى الحطاطي لا يعانون من الربو أو الحساسية الأنفية (٨٥٪)، مما يشير إلى أن هذا العامل لا يشكل خطورة كبيرة على الأطفال.

الاستنتاجات:

الشرى الحطاطي مرض شائع في الأدمة بين الأطفال. توصي الدراسة بإجراء مسح مقطعي أكبر، وزيادة الوعي بالمرض، والمحافظة على النظافة بانتظام، وإجراء مزيد من البحث لاستكشاف العلاقة بين المتغيرات الديموغرافية والعوامل المسببة للأرتكاريا الحطاطية عند الأطفال، وتوفير وصول أفضل إلى الرعاية الصحية.

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الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
جامعة ٢١ سبتمبر للعلوم الطبية والتطبيقية
كلية الطب البشري
FACULTY OF MEDICINE

معدل انتشار الشرى الحطاطي والعوامل المرتبطة به عند الأطفال المترددين على عيادة الأمراض الجلدية في المستشفيات العامة الرئيسية بمدينة صنعاء-اليمن، ٢٠٢٢م

(بحث مقدم إلى كلية الطب والعلوم الصحية كمتطلب للحصول على درجة بكالوريوس طب عام وجراحة)

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