

How to Cite:

Denissafitri, A., Umborowati, M. A., Ervianti, E., Murtiastutik, D., Hidayati, A. N., Rahmadewi, R., & Prakoeswa, C. R. S. (2022). Risk factors of acute and chronic urticaria in dermatology and venereology outpatient clinic Dr. Soetomo General Academic Teaching Hospital, Surabaya, Indonesia. *International Journal of Health Sciences*, 6(S9), 314–319.
<https://doi.org/10.53730/ijhs.v6nS9.12251>

Risk factors of acute and chronic urticaria in dermatology and venereology outpatient clinic Dr. Soetomo General Academic Teaching Hospital, Surabaya, Indonesia

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Abstract--Urticaria is a skin disorder characterized by localized redness or edema of the mucosa followed by an itching sensation that subsides within a day. Proper treatment not only requires pharmacological treatment but also preventive measures to reduce the impact of risk factors that can worsen the patient's urticaria complaints. This study is an observational study with a retrospective approach that aims to evaluate the risk factors of acute and chronic urticaria patients at Allergy Immunology Division Dermatovenereology Outpatient Clinic Dr. Soetomo General Academic Teaching Hospital, Surabaya, Indonesia from 2018 to 2020. This study found 179 new urticaria patients with the number of acute urticaria patients 114 patients (63.7%) and chronic urticaria 65 patients (36.3%). The analysis was conducted based on the characteristics of the samples gender, age, atopic history with a p -value >0.05 . There was a statistically significant correlation between Body Mass Index (BMI) ($p=0.003$). The multivariable logistic regression analysis showed BMI (OR=1.16; 95%CI=1.05-1.27; $p=0.002$) and history of allergic rhinitis (OR=4.32; 95%CI=1.25-14.86; $p=0.020$) were factors that played a significant role in the incidence of chronic urticaria.

Keywords---acute urticaria, chronic urticaria, risk factors, health risks.

Introduction

Urticaria is a skin disorder characterized by local redness or mucosal edema is followed by itching that subsides within a day (Hide et al., 2019). The classification of urticaria based on the duration of the complaint is divided into acute urticaria lasting less than six weeks and chronic urticaria lasting more than six weeks (Radonjic-Hoesli et al., 2018). The diagnosis of urticaria must include a good anamnesis and physical examination, seeking information about possible precipitating factors and important data about the manifestation of urticaria. Laboratory tests and provocation tests should be performed on the basis of a careful history and clinical examination (Criado et al., 2015; Hide et al., 2019).

The main management of all types of urticaria is identification of the cause and avoidance of trigger factors and administration of antihistamines (AH) with H1 antihistamines as the first drug of choice (Hide et al., 2019; Wirantari et al., 2014; Zuberbier et al., 2018). Urticaria has a huge impact on the quality of life of patients, but the complaints and symptoms are often ignored by both patients and health workers. Proper treatment requires not only pharmacological treatment but also the application of preventive measures to reduce the effects of risk factors that can exacerbate patient complaints (Sánchez-Borges et al., 2012). This study was conducted to determine and avoid the risk factors in order to provide better education and management in patients with acute and chronic urticaria.

Materials and Method

This research is an observational analytic study with a cross-sectional retrospective approach which was conducted at Allergy Immunology Division Dermatovenereology Outpatient Clinic Dr. Soetomo General Academic Teaching Hospital, Surabaya, Indonesia from 2018 to 2020. A total sampling technique was performed, obtained from medical records of new patients with a diagnosis of acute and chronic urticaria. This study was approved by the Ethics Committee of Dr. Soetomo General Academic Hospital Surabaya.

Discussion

This study found a total 179 urticaria patients in the Allergy Immunology Division Dermatovenereology Outpatient Clinic Dr. Soetomo General Academic Teaching Hospital Surabaya from 2018 to 2020, consisting of 114 patients (63.7%) with acute urticaria and 65 patients (36.3%) with chronic urticaria. Table 1 present data that there was a statistically significant correlation between Body Mass Index (BMI) ($p=0.003$) with the incidence of acute urticaria and chronic urticaria. Gender, age, and atopic history were not significantly related with the duration of urticaria.

Table 1. Association the subjects variables of acute and chronic urticaria

Variables	Total n (%)	Acute urticaria n (%)	Chronic Urticaria n (%)	<i>p</i> - Value
Gender				0.980 ^a
Male	59 (33.0)	37 (32.5)	22 (33.8)	
Female	120 (67.0)	77 (67.5)	43 (66.2)	
Age (year old)		36.71±14.96	37.23±12.68	0.587 ^b
15-40	110 (61,5)	68 (59.6)	42 (64.6)	
41-59	54 (30,2)	34 (29.8)	20 (30.8)	
>60	15 (8,4)	12 (10.5)	3 (4.6)	
Body Mass Index (BMI)		23,19±4,06	24,81±3,70	0.003 ^{*b}
Underweight	9 (5,0)	9 (7.9)	0 (0.0)	
Normal	113 (63,1)	75 (65.8)	38 (58.5)	
Overweight	44 (24,6)	24 (21.1)	20 (30.8)	
Obese	13 (7,3)	6 (5.3)	7 (10.8)	
Atopic History				
Asthma	13 (7.3)	5 (4.4)	8 (12.3)	0.071 ^a
Atopic Dermatitis	16 (8.9)	11 (9.6)	5 (7.7)	0.866 ^a
Allergic Rhinitis	16 (8.9)	7 (6.1)	9 (13.8)	0.143 ^a

^aChi-square test, ^bMann-Whitney test, * p -value<0.05 is considered significant.

Table 2. Multivariate analysis of risk factors for acute and chronic urticarial

Variables	<i>p</i> -Value	OR	95%CI
Body Mass Index (BMI)	0.002	1.156	1.055-1.266
Allergic Rhinitis	0.020	4.317	1.254-14.864

Table 2 presents the multivariable logistic regression analysis results to identify risk factors for acute and chronic urticaria. This study showed a significant value of BMI and allergic rhinitis that really affects the duration of urticaria.

Several risk factors seem to play a role in the incidence of urticaria such as gender, age, nutritional status and history of atopy (Antia et al., 2018; Hon et al., 2019; Wedi, 2020). History of atopy in urticaria patients such as atopic dermatitis, asthma and allergic rhinitis can play a role in the incidence of chronic urticaria (Kim et al., 2017).

In our study, there were 120 women (67%) more women than men, 49 patients (33%), we found that the rate ratio was nearly 1:2 for male to female with the highest age group being 15-40 years as many as 110 patients (61.4%). The results of this study showed that the most acute urticaria patients were in the age range of 15-40 years (68 patients), followed by 41-59 years (34 patients), then >60 years (12 patients). Patients with chronic urticaria were mostly found in 42 patients at the age of 15-40 years, 20 patients at the age of 41-59 years and 3 patients at the age of >60 years. There was no significant relationship between age and the incidence of acute and chronic urticaria (p 0.587).

The most acute urticaria patients with normal nutritional status were 75 patients (65.8%), followed by over nutritional status as many as 24 patients (21.1%), undernutrition status as many as 9 patients (7.9%) and obesity as many as 6 patients (5.3%). Most of the chronic urticaria patients had normal nutritional status as many as 38 patients (58.5%) and obesity as many as 7 patients (10.8%). The results of univariate analysis obtained p value <0.05 , which means that there is a relationship between nutritional status and the incidence of acute and chronic urticaria. Most patients with acute urticaria had a history of atopic dermatitis in 11 patients (9.7%) while many patients with chronic urticaria had a history of asthma in 8 patients (12.3%). The results of the multivariable logistic regression analysis showed that BMI (OR=1.16; 95%CI=1.05-1.27; p =0.002) and history of allergic rhinitis (OR=4.32; 95%CI=1.25-14.86; p =0.020) were factors that played a significant role in the incidence of chronic urticaria.

A study conducted by Shalom et al. in Israel with 11,261 chronic urticaria patients showed in a bivariate analysis chronic urticaria was significantly associated with higher BMI and obesity prevalence. In multivariate analysis, chronic urticaria was found to be significantly associated with metabolic syndrome, one of which was obesity (Shalom et al., 2018). Epidemiological studies by Lapi et al. in 2002-2013 in Italy with a sample size of 14,859 showed a significant association between chronic urticaria and obesity, and a possible pathogenetic involvement of adipokine-mediated factors and/or inflammation. There were findings of adipokine activity on the immune system and

inflammation. Obesity is characterized by a chronic systemic inflammatory state, and can decrease immunological tolerance to antigens, thereby increasing the risk of allergies and various immune-mediated diseases. Human mast cells can also be direct targets of adipokine activity. Serum mast cell-derived tryptase levels and adipose tissue mast cell counts were reported to be elevated in each obese patient fed a high-fat diet. Comparison of the individual components of the metabolic syndrome between patients with chronic urticaria revealed that obesity was more common in chronic disease, and was significantly correlated with levels of tumor necrosis factor- α , total serum IgE and cationic eosinophil protein (Lapi et al., 2016).

History of atopy in urticaria patients such as atopic dermatitis, asthma and allergic rhinitis can play a role in the incidence of chronic urticaria. This is because the pathophysiology of atopy and urticaria overlaps and is related (Zaky et al., 2010), a history of atopy can be a comorbidity of urticaria. Serum total IgE concentrations with high results can be found in one of the patients suffering from atopic diseases (atopic dermatitis, asthma, allergic rhinitis). IgE-mediated allergic mechanisms due to elevated serum IgE levels have also been found in patients with urticaria (Zaky et al., 2010). The causes and risk factors for urticaria are very varied, so that prevention is taken from one patient to another is different (Rafikasari et al., 2019). In this study we found that rhinitis allergy showed a significant value that really affects the duration of urticaria.

Conclusion

This study found that BMI and allergic rhinitis were statistically significant in influencing the incidence of chronic urticaria.

Acknowledgments

The authors would like to express their gratitude to Department of Dermatology and Venereology, Dr. Soetomo General Academic Teaching Hospital, Surabaya, Indonesia.

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