Comparison of Mean Platelet Volume in Urticaria and Non Urticaria Patient in Dr. Saiful Anwar Regional Hospital Malang

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Abstract: Increased of Mean Platelet Volume (MPV) is one of potential marker for disease activity especially for urticaria based on extrinsic coagulation pathway activity, alternative complement pathway and autoimmune. Another study showed decreased on MPV in chronic urticaria. This study is aimed to compared MPV value in urticaria and non-urticaria patient. This analytic observational cross-sectional study was conducted with consecutive sampling and has been held in June – August 2017. The term of inclusion and exclusion criteria was applied. Data was analyzed using independent T test. Anamnesis, physical examination dan blood sampling were done in 23 urticaria and non-urticaria patients each. Data showed increased MPV serum in urticaria compared with non-urticaria patients but this difference was non-significant (sig 0,393; p>0,05). The conclusion is non-significant difference statistically found in serum MPV value between urticaria and non-urticaria patient, the average MPV value in urticaria patient was higher that non urticaria patient. Urticaria type were thought to have a role in MPV value.

1 INTRODUCTION

Mean Platelet Volume (MPV) is simple and accurate marker to evaluate platelet function and activity. It's regularly used in complete blood count examination that point to platelet volume (Dugyu, 2015). Platelet size and volume were depended on bone marrow production. MPV wasn't correlated with platelet ages in circulation (Giuseppe, 2009). Investigation showed that MPV can be used as inflammation marker. Acute urticaria often accompanied with inflammation like fever and leukocytosis (Dugyu, 2015), (Vagdatli, 2010).While in chronic urticaria found strong evidence of increased MPV value compared to healthy subject (Kolkhir, 2016). Cohen et al (2012) found that high MPV value was the most commonly marker found in chronic urticaria (3552 from 12778 patients) (Cohen, 2012).But some investigator found decreased in MPV value in chronic urticaria, so it is still controversial (Isiksacan, 2014). Based on that difference, the author what to investigate the comparation of MPV value in urticaria and non urticaria patient in di Dr Saiful Anwar Regional Hospital Malang.

2 METHODS AND RESULTS

This study used cross-sectional observational analytic design in Dermatology and Venereology Outpatient Clinic and Clinical Pathology Laboratorium In Dr Saiful Anwar Regional Hospital Malang, East Java, Indonesia. The study was approved by the Hospital Ethics Committee then carried out from June to August 2017.

2.1 Patients and Clinical Evaluation

The study sample was 23 urticaria patient and 23 non urticaria patient in Dermatology and Venereology Outpatient Clinic Dr Saiful Anwar Regional Hospital Malang. Inclusion criteria were urticaria and non urticaria patients, aged 18-65 years old, agreed to sign the informed consent. Exclusion criteria were no physical urticaria and vasculitis history, obesity, pregnancy, hypertension, diabetes, active smoker, skin inflammation, vitiligo, dental infection, sinusitis, upper respiratory and urinary tract infection, and aspirin medication in the last 3 month.

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2.2 Mean Platelet Volume (Mpv) Value Measurement

Blood sample was taken as much as 5 ml in EDTA vacutainer tube and processed immediately using Hematology Analyzer Sysmex XN 1000 automatically to get MPV value in Clinical Pathology Laboratorium In Dr Saiful Anwar Regional Hospital Malang

2.3 Data Analysis

Data entry was done on the data sheet. The data then processed with computer program Statistical Package for Social Sciences (SPSS). Normality test using Shapiro-Wilk test and homogenity using Levene test. The comparison of MPV value in urticaria and non urticaria was analysed using independent T test.

There were 23 urticaria and non urticaria patients each aged 18-62 years old included in this study as showed in table 1 baseline characteristic. Average MPV value in urticaria group was 9,72 fL ± 0,71. The lowest MPV value was 8,00 fL and the highest MPV value was 11,2 fL. Average MPV value in non urticaria group was 9,56 fL ± 0,58. The lowest MPV value was 8,20 fL and the highest MPV value was 10,5 fL. Normality test using Shapiro-Wilk test showed that both group have normal distribution. Homogenity test using Levene test showed that data was homogen. Independent T Test was used to compare MPV value in urticaria and non urticaria group. From the table 2 showed that t_{count} was 0,863 with significancy 0,393. Non-significant difference in MPV value between urticaria group compare with non urticaria group can be concluded from $t_{count} < t_{table}$ or significant value is bigger than α 5%, where the average MPV value urticaria group is higher than non urticaria group.

Table 1: Baseline Characteristic.

Category		Urticaria		Non Urticaria	
		n=23	%	n=23	%
Urticaria Type	Acute	17	73,9		
	Chronic	6	26,1		
Age	18-20	5	21.74		
	21-30	9	39.13	21	91.3
	31-40	3	13.04	2	8.7
	41-50	3	13.04		
	51-60	1	4.35		
	61-62	2	8.70		
Sex	Male	7	30.43	8	34.78
	Female	16	69.57	15	65.22
Occupation	Doctor	3	13.04	7	30.43
	College Student	9	39.13	16	69.57
	States Worker	2	8.70		
	Teacher	2	8.70		
	Housewife	1	4.35		
	House maid	1	4.35		
	Student	1	4.35		
	Employee	1	4.35		
	Retired	2	8.70		
	Merchant	1	4.35		
Domicile	Malang	21	91.30	23	100
	Jakarta	1	4.35		
	Solo	1	4.35		
BMI	Under Weight	4	17.39	1	4.34
	Normal	19	82.6	22	95.66
Recurrence	Recur	23	100.00		
Comorbidity	Odema	9	39.13		
	Dyspnea	3	13.04		
Food Trigger	Fish	7	30.43		
	Chicken	2	8.70		
	Egg	2	8.70		
	Meat	1	4.35		
Weather	Hot	4	17.39		
	Cold	12	52.17		
	Dry	1	4.35		
Environment	Dust	8	34.78		
	Fur	2	8.70		
Substance	Metal	3	13.04		
	Plastic	1	4.35		
Others	Systemic Drug	2	8.70		
	Stress	1	4.35		
Patient history of atopy	Dyspnea	2	8.70		
	Rhinitis	2	8.70		
	Urticaria	16	69.57		
Family history of atopy	Dyspnea	3	13.04		
	Rhinitis	1	4.35		
	Urticaria	8	34.78		
	Dermatitis	2	8.70		
Alergic Test	Prick Test	5	21.74		
	Intradermal	1	4.35		

Table 2: Independent Sample t.

Variable	Category	Mean	T_{count}	db	Sig.	Note
MPV	Urticaria	9,72	0,863	44	0,393	Non Significant Difference
	Non Urticaria	9,56				

Note: $t_{table\ (5\%;\ 43)} = 2,017$

3 DISCUSSION

Average MPV value was higher in urticaria compared with non urticaria showed there is platelet mediator roles in urticaria pathogenesis or stimulation on bone marrow secondarily with increased bigger platelet production as result that caused by increased platelet consumption on urticaria wheal or systemic inflammation (Milovanovic, 2004), (Canpolat, 2010), (Purnak, 2011). Platelet role in extrinsic coagulation pathway lead to histamine release and affect disease activity (Aleem, 2015). Bigger platelets were more reactive than normal platelets, with higher tromboxane B2 production (Giuseppe, 2009), (Martin, 1983). *MPV was suitable for long time*

obsevation of inflammation reaction because it was not correlate with other measurement (Milovanovic, 2004). Non-significant difference caused by urticaria type was not considered. According to Vena GA et al (Vena, 2016), platelet activation is more common in chronic urticaria (Vena, 2016). While in acute urticaria, direct interaction between alergen and IgE spesific antigen on mast cell and basophil and trigger mast cell degranulation (Allen, 2012).

4 CONCLUSIONS

The average MPV value in urticaria patient is higher than non urticaria patient, but it has non-significant difference statistically. This may caused by all urticaria type were included without selected in to acute or chronic urticaria as platelet activation process more often in chronic urticaria.

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