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The Relationship Between Diagnosis Of Acute Appendicitis And Leukocytosis Laboratory Results In The General Hospital Of Muhammadiyah Malang Period 2016-2017

Mochamad Aleq Sander

Medical Faculty, University of Muhammadiyah Malang
Bendungan Sutami St. 188A Malang Telp 0341-552442, Fax 0341-582060

Email: aleq.sander@yahoo.com

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ABSTRACT

In making the diagnosis in patients with symptoms that are not typical, the doctor needs to do a supporting examination, one of which is an examination of leukocytes count. This examination is very supportive for the diagnosis of acute appendicitis, can be done at the public health center, the price is affordable, and simple. The number of leukocytes in acute appendicitis generally increases to around 10,000-18,000 µL. The experience at UMM General Hospital also varies greatly in the number of leukocytes in patients with acute appendicitis. We often encounter patients with acute appendicitis who have increased leukocytes (leukocytosis), but it is not uncommon to see patients with normal leukocytes. This type of research was analytic observational with cross-sectional. Samples are all patients with a diagnosis of acute appendicitis that fulfills the criteria of inclusion in inpatient installation of UMM General Hospital. Free variables: leukocytosis and dependent variable: acute appendicitis. Data was analyzed using categorical comparative table 2x2 chi square, with confidence interval of 95% using SPSS release 20. The results showed a significant correlation between appendicitis and leukocytosis with sig = 0.000. The conclusion shows that there is a relationship between the diagnosis of acute appendicitis and the results of leukocytosis laboratory at UMM General Hospital Malang.

Keywords: acute appendicitis, leukocytosis.

INTRODUCTION

Examination of leukocyte count is very helpful in establishing the diagnosis of acute appendicitis and predicting the prognosis. Many researchers have conducted research on the benefits of examining the number of leukocytes. Mohammad Zikrullah Tamanna's research at the Emergency Department of King Fahad Medical City in Saudi Arabia in June 2011-January 2012 showed an increase in leukocyte counts at 89.68% in appendicitis patients (Tamanna MZ, 2012). Anggi Pranita Nasution study at the Pontianak Soedarso General Hospital in 2011 showed an increase in leukocytes in 63.33% of appendicitis patients, and Khrishnan's study at the Haji Adam Malik General Hospital in Medan in 2009 showed an increase in leukocytes in 73.7% in appendicitis patients, so from some of these studies, it can be concluded that examining the count of leukocytes

can help establish the diagnosis of acute appendicitis (Krishnan S, 2009). However, research from Ortega in Madrid states that the number of leukocytes is not significant in diagnosing appendicitis, in which the study found more appendicitis patients with normal leukocyte counts (Ortega P et al, 2008). Seeing the differences in some of the results of this study, researchers interested in conducting research on the relationship between the diagnosis of acute appendicitis and laboratory results of leukocytosis at UMM General Hospital in 2016-2017. The benefit of this research is to know the description of the results of laboratory tests in the number of leukocytes associated with cases of acute appendicitis is expected to reduce the diagnosis error which could increase the morbidity and mortality rate of patients.

METHODS

This study used an analytic observational study using a cross-sectional approach. The population was all acute appendicitis patients who were recorded in the medical record at inpatient installation UMM General Hospital Malang in the period January 2016-December 2017. The sample was all acute appendicitis patients who met the inclusion criteria. The sampling technique used total sampling. The study was conducted by taking secondary data from medical records at Irna UMM General Hospital Malang, where the data of patients with a diagnosis of acute appendicitis both who have not experienced perforation or who have perforated are grouped into 2 (two) patients with leukocytosis and normal leukocytes, then processed into forms table to take the frequency and in the form of diagrams to find the relationship between the independent variable and the dependent variable, then the data were analyzed with a comparative test of categorical unpaired 1 (one) measurement with a 2x2 chi square table with a confidence interval of 95% and interpretation of the chi square if $p < 0.05$ then there is a significant relationship. Hypothesis testing was done by computerization using SPSS release 20 program.

RESULTS AND DISCUSSION

From the 232 cases studied, the highest diagnoses were acute appendicitis in 153 patients (65.9%), while perforated appendicitis was 79 patients (34.1%).

Table of Distribution of patients based on clinical diagnosis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Perforated Appendicitis	79	34.1	34.1	34.1

	Acute Appendicitis	153	65.9	65.9	100.0
Total		232	100.0	100.0	

Based on the number of leukocytes patients with appendicitis are categorized as normal and leukocytosis where of 232 patients it is known that the most patients have normal leukocyte levels that is 125 patients (53.9%), while patients who have leukocytosis are 107 patients (46.1%).

Table of Distribution of patients based on the number of leukocytes.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Normal	125	53.9	53.9	53.9
	Leukocytosis	107	46.1	46.1	100.0
	Total	232	100.0	100.0	

To find out the relationship between appendicitis and leukocytosis, chi square test was used. It is known that from 79 patients who was diagnosed perforated appendicitis, the most experienced leukocytosis were 49 patients (62%) and those who had normal leukocytes were 30 patients (38%), while from 153 patients those with acute appendicitis had the most normal leukocytes, 95 patients (62.1%) and the remaining 58 patients (37.9%) had leukocytosis.

Table of Relationships between Appendicitis and Leukocytosis

			Conclusion		Total
			Normal	Leukocytosis	
Diagnosis	Perforated appendicitis	Count	30	49	79
		% within Diagnosis	38.0%	62.0%	100.0%
	Acute appendicitis	Count	95	58	153
		% within Diagnosis	62.1%	37.9%	100.0%
Total		Count	125	107	232

	% within Diagnosis	53.9%	46.1%	100.0%

Table of Chi Square test

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	12.194[a]	1	.000		
Continuity Correction[b]	11.243	1	.001		
Likelihood Ratio	12.254	1	.000		
Fisher's Exact Test				.001	.000
Linear-by-Linear Association	12.142	1	.000		
N of Valid Cases	232				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 36.44.
b. Computed only for a 2x2 table

Chi square test results obtained sig = 0.000 which means that there is a relationship between the diagnosis of appendicitis and leukocytosis. This shows that statistically in patients with appendicitis both acute and perforation found an increase in the number of blood leukocytes.

Based on the number of leukocytes patients with appendicitis are categorized as normal and leukocytosis in which of 232 patients it is known that most patients have normal leukocyte levels that is 125 patients (53.9%), while patients who have leukocytosis are 107 patients (46.1%). This indicates that not all patients with appendicitis have high leukocytes. There are several things that cause leukocytes are not high in appendicitis patients, which are: 1. The patient has a good immune system, 2. The patient has been treated before coming to the UMM General Hospital and given antibiotics and analgesics so that it can suppress the inflammatory process that was happened, and 3. Patients came to UMM General Hospital in the early stages of inflammation so that the accumulation of leukocytes that occurred had not increased beyond normal limits. These conditions are important to know for general practitioners who provide primary care both in public health centers, clinics, or private practices so as not to be fooled by normal leukocyte results whereas clinically both from history taking and physical examination lead to a diagnosis of appendicitis. In essence, if there is a difference between clinical and laboratory cases that are suspected as appendicitis, general practitioners should trust the clinical examination more and if in doubt they could consult to a surgeon.

Patients who experience perforated appendicitis found that they did not immediately come for a checkup at the nearest health facility for various reasons such as fear of surgery, trust in medicaster, no fees for not joining BPJS, and others. Patients with perforated appendicitis will increase morbidity, mortality, length of hospital stay, and funding because of the incision used by the surgeon to explore the intestine and clear the abdominal cavity. Postoperative complaints will also increase due to prolonged pain and ugly scars until the keloid arises which extends so that it will increase the length of the patient's pain.

CONCLUSION

There is a relationship between the diagnosis of acute appendicitis and leukocytosis laboratory results at the General Hospital of the University of Muhammadiyah Malang.

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