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Blastocystis hominis and its Relationship with Gender of Colorectal Cancer Patients

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ABSTRACT

Blastocystis hominis is a protozoan commonly found in human feces. *Blastocystis hominis* has a wide distribution throughout the world. This study aims to analyze the relationship between the presence of *Blastocystis hominis* and gender in colorectal cancer patients. This research uses an analytical observation method with a cross sectional design. The sample used was 32 colorectal cancer patients, 13 female and 19 male at RSUP Dr. M. Djamil, Padang city. Based on the findings in the *Blastocystis hominis* positive group, there were 5 female patients (38.5%) and 11 male patients (57.9%). In the *Blastocystis hominis* negative group, there were 8 female patients (61.5%) and 8 male patients (42.1%). There was no association between *Blastocystis hominis* and gender in colorectal cancer patients (p=0.280) p>0.05

Keywords: *Blastocystis hominis, Colorectal Cancer*

INTRODUCTION

Colorectal cancer is one of the most common cancers in the world, with an estimated more than 1.9 million new cases and 935,000 deaths in 2020 globally (World Cancer Research Fund International, 2020). Differences between the sexes may play a significant role in (Bray et al., 2018) the epidemiology, pathogenesis, and prevention and management of this cancer. Epidemiological studies suggest that men tend to have higher incidence rates than women, although this gap may vary based on geographic and demographic factors (Bray et al., 2018). Factors such as health behaviors, hormonal responses, and biological differences may play a role in changing the risk of colorectal cancer between male and female (Chan et al., 2012).

Various studies have been carried out to find the causes of cancer, one of which is the protozoan parasite which is thought to cause pathological reactions in the human body, namely *Blastocystis hominis*. *Blastocystis hominis* has been identified as a microorganism that can be found in the human digestive tract, causing an infection known as blastocystosis. A number of studies show that the prevalence of *Blastocystis hominis* infection can vary depending on factors such as gender, geography, level of sanitation, and daily living behavior (Scanlan et al., 2015).

The mechanism of *Blastocystis hominis* infection is still under debate, because some do not cause symptoms, and some can cause symptoms and have the potential to become pathogens (Pramestuti & Saroh, 2017). Various studies related to *Blastocystis hominis* and colorectal cancer were carried out and it was reported that *Blastocystis hominis* is thought to have the ability to degrade IgA which is a surface antibody in mucosal defense (Puthia et al., 2008). According to (Kumarasamy et al., 2022)

Blastocystis hominis is thought to be a pathogen and cause changes to the normal function of the digestive tract by damaging the mucosal lining of the digestive tract and activating oxidative stress which contributes to increasing the risk of DNA damage and mutations in genes in the digestive tract.

Based on this phenomenon, research was conducted to determine the presence of *Blastocystis hominis* and its relationship to gender colorectal cancer patient

MATERIALS & METHODS

This research was conducted at RSUP Dr. M. Djamil Padang and the integrated laboratory of the Faculty of Medicine, Andalas University and the Parasite Laboratory of Andalas University. This method uses 32 stool samples from colorectal cancer patients who were diagnosed by digestive surgery and confirmed by the results of laboratory examinations at the Faculty of Medicine, Andalas University.

The feces will be subjected to DNA isolation using a DNA stool mini kit [QIAGEN] and carried out according to the factory protocol. After the DNA has been isolated, analysis will be continued for the presence of *Blastocystis hominis* using the PCR method using primers BL18SPPF1 (AGTAGTCATACG CTCGTCTAAA) and BL185R2 (TCTTCGTTACCCGTTACTGC) targeting SSU. rRNA gene. The reaction starts from denaturation at 96'C in 3 minutes for 35 cycles, and additional denaturation at 95'C for 30 seconds, annealing at 60'C for 30 seconds and elongation at 72'C for 30 seconds and final elongation at 72'C for 5 minutes, the results of the PCR will be read out using the electrophoresis technique. Data from the two groups will be analyzed using Chi-Square

RESULT

Characteristic	**Category**	***Blastocystis hominis***				**Total**		**P-value ***
		Positive		**Negative**				
Gender		**n**	**%**	**n**	**%**	**N**	**%**	
	Female	5	38,5	8	61,5	13	100	0,280
	Male	11	57,9	8	42,1	19	100	
* Chi-square								

From the table above, it was found that the number of colorectal cancer sufferers was more experienced by male with a total of 19 patients compared to female patients with a total of 13 patients.

From the table above it can be seen that the prevalence of the group of colorectal cancer patients with the presence of positive blastocystis was 5 women (38.5%) and 11 men (57.9%), in the group of colorectal cancer patients with the presence of negative blastocystis there were 8 women and 8 men, a Chi-square test was carried out and the p-value was 0.280, which indicated that there was no association between the presence of *Blastocystis hominis* and the gender of colorectal cancer patients.

DISCUSSION

Analysis of the results of the characteristics of colorectal cancer patients in this study, calculating the prevalence of colorectal cancer patients based on gender in the entire sample of colorectal cancer patients. It was found that the prevalence of colorectal cancer sufferers based on male gender was higher than female.

These results are supported by research conducted in England which states that the prevalence of colorectal cancer based on gender is more in men than in women. Men have a consumption pattern of eating red meat and processed meat, and are the ones who consume alcohol the most and have a smoking habit. Apart from that, men also have a greater tendency to store visceral fat, all of these habits are associated with

increasing the risk of colorectal cancer (White et al., 2018).

The incidence of colorectal cancer in men is 30% higher than in women. The reason why men have a higher risk of developing colorectal cancer than women is still under debate (American Cancer Society, 2017). The hormone estrogen plays an important role in reducing the risk of colorectal cancer. Research has been carried out in the form of giving hormone therapy to menopausal women who experience a decrease in estrogen, and there is an increase in the estrogen hormone in post-menopausal women which is associated with a reduced risk of colorectal cancer (Jang et al., 2019)

The results of the relationship between gender of colorectal cancer patients based on the presence of *Blastocystis hominis* in this study did not have a significant relationship with a value of p=0.280 (p>0.05). The *Blastocystis hominis* parasite is a protozoan parasite that is commonly found in humans and is not influenced by gender and age (Sulżyc-Bielicka et al., 2021).

These results are supported by research conducted in Saudi Arabia conducting an analysis in the form of a comparison of the gender of colorectal cancer patients with the presence of *Blastocystis hominis* where there was no significant relationship between the presence of the *Blastocystis hominis* parasite and gender with a value of p=0.401 (p>0.05)(Ali et al., 2022).

Research conducted in Poland analyzing the presence of *Blastocystis hominis* in colorectal cancer patients also showed that there was no relationship between the gender of colorectal cancer patients and the presence of *Blastocystis hominis* with a value of p= 0.63 (p>0.05) (Sulżyc-Bielicka et al., 2021).

Research conducted in the United Arab Emirates analyzed the relationship between gender and the presence of *Blastocystis hominis* and found no association between gender and the presence of *Blastocystis hominis*, p=0, (Labania et al., 2023)147 (p>0.05) (Labania et al., 2023)

CONCLUSION

There is no association between the presence of blastocystis and gender in colorectal cancer patients, but it is suspected that there are other factors that can influence the presence of *Blastocystis hominis* in colorectal cancer patients, including age, cancer progression, and the patient's own immune response.

Declaration by Authors

Ethical Approval: This research has passed the ethical test of the ethics committee of the Faculty of Medicine, Andalas University, No. 434/UN.16.2/KEP-FK/2023

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