Differences in CEA Levels According to Histopathology Degree of Adenocarcinoma Rectum at Haji Adam Malik Medan Central General Hospital

Unni Bayani Buchari*, Adi Muradi Muhar**, Asrul**

*Resident of Department of Surgery, Faculty of Medicine, Universitas Sumatera Utara, H. Adam Malik Central General Hospital, Medan.

**Consultant of Digestive Surgery Division, Department of Surgery, Faculty of Medicine, Universitas Sumatera Utara, H. Adam Malik Central General Hospital, Medan.

Email: buchari.unni@gmail.com Phone: +6281285004980

ABSTRACT

Introduction

Colorectal cancer is the third most common malignancy of all cancer patients and the fourth leading cause of death in all cancer patients in the world. In a previous study at H. Adam Malik Central General Hospital, it was found that the rectum was the highest site of colorectal cancer.

To diagnosed the rectal cancer, it is necessary to provide non-invasive markers to detect early rectal cancer, such as Carcinoembryonic antigen (CEA). This study aimed to examine the difference in CEA levels according to the degree of histopathology of rectal adenocarcinoma, so that the CEA level can be used as a predictor of histopathologic degree in patients with rectal adenocarcinoma.

Methods

This study is an observational analytic study with cross sectional design. The data were taken from the patient's medical records. Samples of this study were taken in a total sampling of patients who had been treated at Digestive Surgery Clinic in H. Adam Malik Central General Hospital Medan from January 2011 to December 2015 with rectal adenocarcinoma that met the inclusion and exclusion criterias. The data obtained then analyzed by SPSS statistical software ver .20.

Results

During the period January 2011 to December 2015 we found 36 rectal cancer patients who met the inclusion criteria and became the study samples. A total of 19 (52.8%) patients had well differentiated histopathologic result, 15 (41.7%) others was moderately differentiated and 2 (5.6%) remaining was poorly differentiated. Kruskal Wallis test obtained *p* value = 0.048, so it can be concluded that there is a relationship between CEA levels before treatment with tumor histopathology in patients with rectal cancer.

Conclusion

This study obtained differences in CEA levels according to histopathology degree of rectal adenocarcinoma.

Keywords: Rectal cancer, carcinoembryonic antigen (CEA), histopathology degree

Introduction

Colorectal cancer is the third most common malignancy of all cancer patients and the fourth leading cause of death in all cancer patients in the world. From the data Globocan (2012) obtained incidence of colorectal cancer in Indonesia is the third malignancy after breast cancer and lung cancer. Rectal cancer is also the third leading cause of death from all malignant deaths. In a previous study at H. Adam Malik Central General Hospital it was found that the rectum was the highest site of colorectal cancer. Histopathologically rectal cancer can be divided into well differentiated, moderately differentiated, poorly differentiated, and undifferentiated. Generally, undifferentiated tumor is leading to increasingly invasive at the time of its diagnosis, and the more invasive the tumor, the worse the prognosis.

To diagnose the rectal cancer, it is necessary to provide non-invasive markers to detect early rectal cancer, such as Carcinoembryonic antigen (CEA). CEA is a complex glycoprotein (200KD) formed by various neoplasms normally produced by intestinal tissue, pancreas, and embryonic liver. CEA is reported to be positive in 60% to 90% in colorectal cancer, 50% to 80% in pancreatic cancers, and 25% to 50% in gastric cancer, depending on serum levels considered significant.

The 2006 American Society of Clinical Oncology (ASCO) recommendation stated that CEA is examined prior to surgery to assist in staging or action plans as well as to monitor therapeutic response during active treatment. Several factors that affect the level of CEA in patients with rectal cancer are: tumor size, tumor stage, tumor degree, liver function, tumor location, intestinal obstruction, smoking history and tumor status. Several studies have shown that rectal cancer with well differentiated histopathology results in a higher CEA compared with that of poorly differentiated.

This study aimed to examine the difference in CEA levels according to the degree of histopathology of rectal adenocarcinoma, so that the CEA level can be

used as a predictor of histopathologic degree in patients with rectal adenocarcinoma.

Methods

This study is an observational analytic study with cross sectional design. The data were taken from the patient's medical records. Samples of this study were taken in a total sampling of patients who had been treated at Digestive Surgery Clinic in H. Adam Malik Central General Hospital Medan from January 2011 to December 2015 with rectal adenocarcinoma that met the inclusion and exclusion criterias.

The inclusion criteria for this study were patients diagnosed with rectal cancer based on histopathologic examination with good to poor degree of differentiation, and had complete medical records including sex, age, and CEA levels prior to therapy. Samples are excluded when other malignancies are present, have other chronic diseases, have synchronous tumors or other gastroenteric inflammation, and patients who have undergone definitive therapy.

The data obtained then presented descriptively in the form of narrative, proportion distribution tables, then analyzed by SPSS statistical software ver. 20.

Results

During the period January 2011 to December 2015 we found 36 rectal cancer patients who met the inclusion criteria and became the study samples. Patients of male sex is 19 (52.8%) patients, more than the female sex 17 (47.2%) patients. Of the 36 patients, 10 (27.8%) patients were diagnosed with stage II rectal cancer, 23 (63.9%) patients were diagnosed with stage III and 3 (3.83%) patients were diagnosed with stage IV. A total of 19 (52.8%) patients had well differentiated histopathologic results, 15 (41.7%) others were moderately differentiated and 2

(5.6%) remaining were poorly differentiated (Table 1). No samples were obtained with undifferentiated histopathology.

Table 1. Sample Characteristic

Variables	
Sex	
Male	19 (52.8%)
Female	17 (47.2%)
Mean Age (±SD)	54.08 ± 10.65
CEA before treatment	19.00 (3.80-1146.00)
Tumor Histopathology	
Well differentiated	19 (52.8%)
Modearately differentiated	15 (41.7%)
Poorly differentiated	2 (5.6%)
Sample size	36

In this study the median range for well differentiated histopathology was 23.8 (7.9-146.0), moderately differentiated was 17.9 (3.8-93.2), while poorly differentiated was 26.6 (20.9-32.3).

Table 2. Differences in CEA levels before treatment according to histopathology of cancer

Tumor Histopathology	Frequency	Mean rank	*p* Value
Well differentiated	19	14.30	
Moderately differentiated	15	21.21	0.048
Poorly differentiated	2	24.25	
Total	36		

Through Table 2, it can be seen that the results of Kruskal Wallis test obtained *p* value = 0.048, so it can be concluded that there is a relationship between CEA levels before therapy with tumor histopathology in patients with rectal cancer.

Discussion

In this study, the histopathologic degree was divided into 3, well differentiated, moderately differentiated, and poorly differentiated. It was found that most histopathologic degree were well differentiated by 19 (52.8%) patients, followed by moderately differentiated 15 (41.7%) patients, then poorly differentiated by 2 (5.6%) patients. The association between CEA levels before treatment with histopathology was statistically significant ($p = 0.048$), so it can be concluded that there is a relationship between CEA levels before therapy with histopathology in patients with rectal cancer. The results obtained are slightly different from the studies conducted in China by Lee et al. They found that most histopathologic degree were moderately differentiated with 52% of patients, 26% were differentiated, poorly differentiated 17.9%, and at least 7% mucinous. However, different results in the correlation between CEA and histopathology were obtained in the American study by Jorge P, which said that CEA is independent of histopathologic degree, or there was no relationship between the them.

CEA is currently more widely used to assess post-operative recurrence and is still rarely used for prognosis and preoperative diagnosis. In another study conducted Fahrizal et al (2017) mentioned there is a significant relationship between CEA levels with the incidence of metastasis in colorectal cancer. In the study it is said that there is a strong and significant relationship between CEA levels with colorectal carcinoma metastasis.

The study can yield different conclusions if the sample with undifferentiated histopathology degree was found. The drawback of this study is the small number of samples, so further research using larger samples is needed to find the association of CEA levels before therapy with histopathology of rectal cancer. The small number of samples in this study is caused by two factors that most commonly found that is the lack of adherence of medical personnel to complete the medical record and the lack of awareness of the surrounding community to check their health status

to the doctor. Many among the surrounding community prefer to seek help to traditional treatment than to doctors, especially for cases of cancer. This is influenced by several factors as explained by Ismail (2017) in his research, namely the source of information, socio-cultural, and income society.

Conclusion

This study obtained differences in CEA levels according to histopathology degree of rectal adenocarcinoma.

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