

Radiological Diagnosis of Hepatic Steatosis in Patients with Colorectal Cancer

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A B S T R A C T

Introduction: Colorectal cancer is the most common type of cancer worldwide. Insulin resistance, metabolic syndrome, obesity, type 2 diabetes, and dyslipidemia are the risk factors associated with cancer as well as non-alcoholic liver steatosis. There is evidence on the relationship between non-alcoholic liver steatosis with colorectal cancer. This study aims to find out the correlation between colorectal cancer and non-alcoholic liver steatosis by using computed tomography images taken for staging.

Material and Methods: A retrospective study was carried out in MNR Medical College and Hospital from June 2015 to July 2017. A total of 68 patients with colorectal cancer included in this study. 35 patients with no history of cancer presented as a control group.

Results: A total of 68 patients, 46 were male, and 22 were female. Liver density on CT was lower in the colorectal cancer patient group than in the control group.

Conclusion: The liver density on contrast-enhanced computed tomography of colorectal cancer patients was low, which correlated with non-alcoholic fatty liver disease.

Key words: Non-alcoholic liver disease (NAFLD), colorectal cancer (CRC), contrasts enhanced computed tomography.

INTRODUCTION

The nonalcoholic fatty liver disease is the more common clinical entity in recent years. Several risk factors associated with NAFLD, such as obesity, type 2 diabetes, Insulin resistance, metabolic syndrome and colorectal cancer.¹ Recent evidence revealed a correlation between colorectal cancer and NAFLD. Colorectal cancer (CRC) is one of the most common cancers worldwide.² It is also the second most common cause of mortality worldwide.^{3,4} Overweight is the commonest cause of increasing metabolic syndrome worldwide. A metabolic disorder characterized by low high-density lipoprotein (HDL), hyperglycemia, and hypertension.⁵ The nonalcoholic fatty liver disease (NAFLD) is one of the common risk factors for developing colorectal cancer.^{6,7} Adams et al. reported that NAFLD associated with an increased risk of dying from malignancy.⁸ Hwang et al. revealed an association between NAFLD and an increased rate of colorectal cancer.⁷ Liver biopsy is the gold standard to diagnose NAFLD, but due to its invasive nature, imaging methods are preferable for the diagnosis of NAFLD. USG is the commonly used imaging technique for the determination

of fatty liver disease and it can also be diagnosed by computed tomography (CT) and magnetic resonance imaging (MRI). The sensitivity and specificity of USG for the diagnosis of hepatic steatosis showed 60-94% and 84-95% respectively. Chemical shift MRI reported sensitivity and specificity was 90% and 91%.⁹ According to Park et al. study, unenhanced CT sensitivity and specificity was 82%, and 100% for the diagnosis of hepatosteatosis.¹⁰ Contrast CT imaging is proved to be more accurate for determination of staging. Kim et al. study also reported the similar pattern.¹¹ Using non-contrast CT examination, Idilman et al. determined increased NASH incidence in patients with Type 2 DM and coronary stenosis.¹² In this study, liver density evaluated by contrast-enhanced computed tomography images of cases diagnosed with CRC.

MATERIALS AND METHODS

The study was carried out in MNR Medical College and Hospital during the period from June 2015 to July 2017. A total of 68 colorectal cancer patients included in the study. The abdominopelvic CT images performed for cancer staging. The liver and other organs re-evaluated in

respect of metastasis. The healthy control group included 35 individuals with no history of cancer and fatty liver disease. Serum biochemical tests are done for patients and control group. The guidelines of the Declaration of Helsinki followed during the study period. The institutional ethical committee approved this study. SPSS 20.0 statistical software was used to analyze the data.

RESULTS

Out of 68 cases with colorectal cancer were 37 males (54.4%) and 31 females (45.6%). Among 35 control group, 19 were males (54.28%), and 16 were females (45.7%). The mean age was 61.13±10 years in CRC group and 57.16±16 in control group. The CT scores determined as 94.68±10.8 in the control group and 65.50±15.6 in the patient group, which was statistically significant (Table 1). Similar findings recorded in both study groups; regarding age, gender, and AST values. The difference in ALT values in both the groups was not statistically significant.

DISCUSSION

NAFLD is one of the liver metabolic syndromes, associated with an increase in the risk of colorectal cancer. Non-contrast CT usually used for the examination of hepatosteatosis. Contrast images recommended in routine abdomen CT evaluations. In the current study, liver steatosis evaluated on contrast CT images performed for the staging of CRC patients. But there was not much difference in accuracy of contrast and non-contrast images in the evaluation of hepatic steatosis.¹³ Lawrence et al. reported a sensitivity of 60% and specificity of 100% in contrast CT in the determination of hepatosteatosis.¹⁴ Another study done by Johnston et al. showed that contrast CT had a sensitivity of 54-71% in the evaluation of hepatosteatosis.¹⁵ Lin et al. study reported NAFLD patients associated with higher rate of CRC.¹⁶ Hwang et al. demonstrated an association between NAFLD and an increased rate of colorectal adenomatous polyps.¹ Stadlmayr et al. recorded in their study, 53.3% had colon adenomatous polyps, and 1% had CRC along with NAFLD.¹⁷ Miyake et al. reported that 5-Fluorouracil and UFT in CRC patients increased hepatic steatosis.¹⁸ Lipolysis associated with advanced stage CRC. Therefore it is not expected that storage of fat tissues in the liver

during the advanced stage of cancer. According to Murono et al. study revealed the low prevalence of liver metastasis identified in CRC patients without hepatosteatosis.¹⁹

CONCLUSION

In this present study contrast, CT of CRC patient reveals a higher rate of hepatosteatosis in CRC patients. Our findings correlate with those in literature. The contrast CT alone can use to examine the NAFLD in CRC patients.

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Characteristics	Control group	CRC group	P value
Male	54.28%	54.4%	0.042
Female	45.7%	45.6%	
Age	57.16±16	61.13±10	0.863
AST	27.15±11.7	26.26±15.0	0.689
ALT	21.07±20.9	22.27±14.0	0.079
CT score	94.68±10.8	65.50±15.6	< 0.001

Table-1: Comparison between CRC and Control groups in respect of biochemical parameters and CT score.

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