

Association of MELD Score with Colonic Mucosal Changes on Colonoscopy among the Patients of Portal Hypertension

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ABSTRACT

Introduction: Portal hypertension causes hemodynamic and mucosal changes in the entire gastrointestinal (GI) tract upper as well lower GI tract. The portal hypertension related changes in the colon described as portal hypertensive colopathy (PHC), colonic varices, rectal varices, vascular ectasia in colon & rectum and hemorrhoids. So we planned this study to assess whether the presence of portal hypertension related colonic lesions correlates with severity of liver disease as indicated by MELD scores.

Materials and Methods: This study was done over a period of one year. In this study, 100 patients of portal hypertension due to different etiologies were taken if they met the inclusion criteria. A hospital based study was conducted by using predesigned and pretested Performa for obtaining information regarding socio-demographic variables, history of life style risk factors and lab investigations including upper GI endoscopy and colonoscopy at endoscopy lab. Data was expressed as rates, ratios and percentages and compared using Chi-square test and P value < 0.05 was considered significant.

Results: In the present study most of the patients (67%) were male and 33% were female. Mean age of study patient was 45.91±15.28 years. In present study 62% of the patients were

had MLED score 11-18, 16% had MLED score 19-26, 12% had MLED score ≤10 and only 10% had MLED score >27.

Conclusion: Patients with portal hypertension have significantly higher frequency of colonic lesions as severity of liver disease increases indicated by colonoscopy and MELD scores. So it can be concluded that lower GI manifestation of portal hypertension are clinically significant with MELD score.

Keywords: Colonic Lesions, MELD Score, Portal Hypertension, Colonoscopy.

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INTRODUCTION

Cirrhosis of liver is histological development of regenerative nodules surrounded by fibrous bands in response to chronic liver injury that leads to portal hypertension and end-stage liver disease.¹ The most common cause of portal hypertension is liver cirrhosis. The commonest causes of cirrhosis worldwide are alcohol abuse and viral hepatitis (B and C).²

Portal hypertension is a significant complicating feature of decompensated cirrhosis and is responsible for the development of ascites and bleeding from esophagogastric varices, two complications that signify decompensated cirrhosis.¹ Portal hypertension causes hemodynamic and mucosal changes in the entire gastrointestinal (GI) tract upper as well lower GI tract. The portal hypertension related changes in the colon described as portal hypertensive colopathy (PHC), colonic varices, rectal varices, vascular ectasia in colon & rectum and hemorrhoids.³ The prevalence of PHC in patients with cirrhosis varies from 25% to 70%. The presence of rectal or colonic varices also varies widely,

being reported in from 4% to 40% of patients. It is evident that colonoscopy is very important investigation for defining lower GI features of portal hypertension.⁴

A model has been developed for the assessment of prognosis which is the Model of End-stage Liver Disease (MELD). In this model there are only objective parameters, bilirubin, prothrombin time and creatinine.⁵ So this study is planned to see the spectrum and frequency of colonic lesions in patients with portal hypertension and to assess whether colonic lesions on colonoscopy associated with severity of liver disease as measure in MELD scores.

OBJECTIVES

To assess the spectrum and frequency of colonic lesions among the patients with portal hypertension and to assess presence of colonic lesions on colonoscopy associated with severity of liver disease as measure in MELD scores.

MATERIALS AND METHODS

The present study was conducted at R.N.T. Medical College and attached group of hospitals, Udaipur (Rajasthan). This study was done over a period of one year. Ethical approval from the institutional ethical committee was obtained. Written & informed consent from patient were taken. In this study, 100 clinically stable patients of portal hypertension due to different etiologies were taken if they met the inclusion criteria.

Inclusion criteria: (i) Age > 12 years and ≤ 85 years. (ii) clinically stable Portal hypertension patient due to any cause.

Exclusion criteria: (i) Age <12 years and >85 years. (ii) Clinically unstable patients such as on vaso pressure support, on ventilator support or in hepatic encephalopathy etc. (iii) Inflammatory Bowel Disease patients. (iv) Upper GI and colonic malignancy patients. A predesigned and pretested Performa were used for obtaining information regarding socio-demographic variables, history of life style risk factors and lab investigations including upper GI endoscopy and colonoscopy at endoscopy lab.

Definitions: **Portal hypertension** is defined as the elevation of the hepatic venous pressure gradient (HVPG) to >5 mmHg.¹

Portal hypertensive colopathy (PHC) is defined as colitis like abnormalities and/or vascular lesions such as erythema of the colonic mucosa, vascular lesions including cherry-red spots, arterial spider like lesions or angiodysplasia-like lesions.⁴

Model of end stage liver disease (MELD) scores objective parameters are bilirubin, prothrombin time and creatinine. It is calculated according to the following formula

$$\text{MELD} = 3.78 \times \ln [\text{serum bilirubin (mg/dL)}] + 11.2 \times \ln [\text{INR}] + 9.57 \times \ln [\text{serum creatinine (mg/dL)}] + 6.43.$$

MELD scores are reported as whole numbers, so the result of the equation above is rounded.⁵

Tools: Flexible fiber optic video endoscope and colonoscope, USG machine, sample collection set, computer for data analysis, reagents and tubes for blood investigations, ECG machine, sphygmomanometer, pulse oximeter.

Statistical Analysis

The data obtained was coded and entered in Microsoft Excel spreadsheet. The categorical data was expressed as rates, ratios and percentages and compared using Chi-square test and P value < 0.05 was considered significant.

Table: 1. Association of MELD score with rectal varices on colonoscopy

MELD score	Rectal Varices				p value	
	Present (n=57)		Absent (n=43)			Total (N=100)
	No	%	No	%		
< 10	5	41.67	7	58.33	12	
11-18	29	46.77	33	53.23	62	
19-26	15	93.75	1	6.25	16	
>27	8	80.00	2	20.00	10	
Total	57	57.00	47	47.00	100	

* = statistically significant

Table: 2. Association of MELD score with Rectopathy on Colonoscopy

MELD score	Rectopathy				p value	
	Present (n=39)		Absent (n=61)			Total (N=100)
	No	%	No	%		
< 10	3	25.00	9	75.00	12	
11-18	17	27.42	45	72.58	62	
19-26	11	68.75	5	31.25	16	
>27	8	80	2	20.00	10	
Total	39	39.00	61	61.00	100	

* = statistically significant

Table: 3. Association of MELD score with Portal Hypertension Colopathy on Colonoscopy

MELD score	Portal Hypertension Colopathy				p value	
	Present (n=32)		Absent (n=68)			Total (N=100)
	No	%	No	%		
< 10	5	41.67	7	58.33	12	
11-18	10	16.13	52	83.87	62	
19-26	13	81.25	3	18.75	16	
>27	4	40.00	6	60.00	10	
Total	32	32.00	68	68.00	100	

* = statistically significant

RESULTS

In the present study most of the patients (67%) were male and 33% were female. Mean age of study patient was 45.91 ± 15.28 and most of patient 69% were in age group 31-60 years, 18% were less than 30 years and 13% were aged more than 60 years. In the present study most common presentation of patients was ascites in 87% and pedal oedema in 73% followed by jaundice in 61%, malena in 38%, hematemesis in 30%, bleeding per rectum in 20% and Hepatic encephalopathy in 15%. In present study 62% of the patients were had MLED score 11-18, 16% had MLED score 19-26, 12% had MLED score ≤ 10 and only 10% had MLED score > 27 .

As depicted in table -1, In the present study 41.67% of the MELD Score < 10 patients, 46.77% of the MELD Score 11-18 patients, 93.75% of the MELD Score 19-26 patients and 80% of the of the MELD Score > 27 patients had rectal varices on Colonoscopy in Portal Hypertension patients and this difference was statistically significant ($p < 0.05$).

Table -2 shows Association of MELD score with rectopathy on colonoscopy, 25% of the MELD Score < 10 patients, 27.42% of the MELD Score 11-18 patients, 68.75% of the MELD Score 19-26 patients and 80% of the of the MELD Score > 27 patients had rectopathy on Colonoscopy in Portal Hypertension patients and this difference was statistically significant ($p < 0.05$).

In the present study, as depicted in table -3 41.67% of the MELD Score < 10 patients, 16.13% of the MELD Score 11-18 patients, 81.25% of the MELD Score 19-26 patients and 40% of the of the MELD Score > 27 patients had portal hypertensive colopathy on colonoscopy in portal hypertension patients and this difference was statistically significant ($p < 0.05$).

DISCUSSION

In the present study most of the patients (67%) were male and 33% were female. Mean age of study patient was 45.91 ± 15.28 and most of patient 69% were in age group 31-60 years, 18% were less than 30 years and 13% were aged more than 60 years. A study by B Ramesh Kumar et al⁶ observed the mean age of patients was 44.2 years and most of patient 65% belongs to age group 30-50 years. MELD score also calculated for all these patients and patients were categorized based on MELD score into 4 groups. In this study 62% of the patients had MELD score 11-18, whereas 16% patients had MELD score 19-26 and 12% of the patients had MELD score ≤ 10 . While only 10% patients had MELD score ≥ 27 . In the study by B Ramesh Kumar et al⁶ found 62% of cases had a MELD score between 11 – 18 followed by, 18% cases had a MELD score of < 10 , 14% had score between 19 – 24 and 6% above 24.

In the present study rectal varices were found in 57% of cases. This is higher than reported prevalence by Ghoshal UC et al,⁷ Misra SP et al⁸ reported in 31.7% and 40% respectively. There was statistically significant relation between presence of rectal varices and increasing MELD score ($p < 0.05$). Similar results were observed by B Ramesh Kumar et al.⁶ The association between rectopathy and increasing MELD score was statistically significant ($p < 0.05$).

Portal hypertensive colopathy (PHC) was seen in 32% of the cases and rectopathy was present in 39% of the cases. In the study by B Ramesh Kumar et al⁶ PHC was seen in 33% of the cases. In studies by Diaz-sanchez A et al,⁹ Weismuller TJ et al,¹⁰

PHC was seen 23.9% and 24.3% of cases respectively which is lower than the present study. Whereas Salama ZA et al,¹¹ Jeong IB et al,¹² Bresci et al¹³ Ito K et al¹⁴ reported prevalences of 45.7%, 45.8%, 54%, 66% respectively which is higher than the present study. The prevalence of PHC has wide variation may be due to lack of a clear classification system, lack of criteria for endoscopic appearance of PHC and inter observer variability. The association between PHC and increasing MELD score was statistically significant ($p < 0.05$). In the study by B Ramesh Kumar et al⁶ and Jeong IB et al¹² demonstrated a statistically significant correlation between the prevalence of portal hypertensive colopathy and increasing MELD score. This relation between portal hypertension related colonic lesions and MELD score may be explained by worsening of fibrosis leading to increase in portal pressure and worsening haemodynamic dysfunction associated with high MELD score suggestive of advanced liver disease.

CONCLUSION

The frequency of portal hypertension related colonic lesions including rectal varices, rectopathy and portal hypertensive colopathy more frequent in cirrhotic patients with higher MELD score. MELD score is the most accepted prognostic scoring system for establishing changes in lower gastro intestinal system.

LIMITATIONS

Limitation of this study was that we have done only in hundred cases. So, further study is needed on more patients to find colonoscopic lesions along with upper gastro intestinal lesion with portal hypertensive population in this part of Rajasthan.

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