Platelet count/spleen diameter ratio predicted the presence of esophageal varices in liver cirrhosis

Giannini E, Botta F, Borro P, et al. **Platelet count/spleen diameter ratio: proposal and validation of a non-invasive parameter to predict the presence of oesophageal varices in patients with liver cirrhosis.** Gut. 2003;52:1200-5.

QUESTIONS

In patients with cirrhosis, what clinical, biochemical, and ultrasonographic variables predict the presence of esophageal varices (EV)? Are the identified rules accurate for detecting EV in compensated cirrhosis?

DESIGN

Associations between clinical, biochemical, and ultrasonographic variables, and presence of EV in patients with cirrhosis were evaluated in 2 groups, 1 for derivation and 1 for validation. The accuracy of the identified rules was also tested in a subgroup of patients with compensated cirrhosis.

SETTING

A university hospital in Genoa, Italy.

PATIENTS

266 patients (mean age 62 y, 68% men) with cirrhosis referred for staging of liver disease. 145 patients were included in the derivation set and 121 in the validation set. The identified rules were further evaluated in 145 patients with compensated cirrhosis. Exclusion criteria included active gastrointestinal bleeding, previous treatment for portal hypertension, previous treatment of EV, and alcohol abuse.

DESCRIPTION OF PREDICTION GUIDE

Univariate analysis showed that total serum bilirubin levels, prothrombin activity, spleen diameter, Child–Pugh score, platelet count, and platelet count/spleen diameter (PC/SD) ratio predicted the presence of EV. However, multivariate logistic regression showed that PC/SD ratio was the only variable that independently predicted presence of EV. A PC/SD ratio cutpoint of ≤ 909 (for presence of EV) was estimated from the corresponding receiver-operating characteristics curve. Classification using the decision rule was compared with a definitive diagnosis of EV from endoscopy.

MAIN OUTCOME MEASURES

Sensitivity, specificity, and positive and negative likelihood ratios.

MAIN RESULTS

61% and 58% of patients in the derivation and validation groups, respectively, had EV. Sensitivity, specificity, and positive and negative likelihood ratios for the decision rule applied to each group of patients are in the Table. Endoscopy on only patients with a PC/SD ratio ≤ 909 was more cost-effective than endoscopy on all patients (181 vs 249 Euros per patient identified with EV).

CONCLUSION

In patients with cirrhosis, platelet count/spleen diameter ratio had 100% sensitivity but specificity varied for predicting the presence of esophageal varices.

Operating characteristics of platelet count/spleen diameter ratio (cutpoint ≤ 909 for a positive diagnosis) for predicting the presence of esophageal varices in cirrhosis*

Patient groups	Sensitivity (95% CI)	Specificity (CI)	+LR	–LR
Derivation set	100% (100 to 100)	93% (82 to 98)	14.3	0.0
Validation set	100% (100 to 100)	42% (28 to 57)	1.7	0.0
Compensated cirrhosis	100% (100 to 100)	71% (60 to 81)	3.5	0.0

*Diagnostic terms defined in Glossary.

COMMENTARY

The diagnosis of esophageal or gastric varices in patients with cirrhosis confirms the irreversible progression of liver disease and portal hypertension. It also provides opportunities for intervention, including primary prophylaxis for variceal hemorrhage by drugs or endoscopic therapy, future treatment of ascites and hepatic encephalopathy, and consideration for liver transplantation. Thus, investigations to identify EV by noninvasive and inexpensive methods are inherently attractive.

The attempt by Giannini and colleagues to use the PC/SD ratio in patients with cirrhosis exploits the pathophysiologic relation of portal hypertension and hypersplenism. The study design was sound, having first evaluated the hypothesis in a retrospective study (derivation set), followed by a prospective study (validation set) and an analysis of patients with compensated cirrhosis (compensated set). In these patients, the prevalence of EV was similar, albeit slightly lower in the compensated set (45% vs 61% and 59% in the derivation and valida-

tion sets, respectively). In patients with PC/SD ratios ≤ 909, the high sensitivity and positive predictive values show the ratio's potential as a screening test for EV. The lower specificity in the validation and compensated sets suggests that it is not yet a diagnostic test for EV. The difference in cost based on the number of endoscopic tests avoided is modest, but the benefit may be apparent if large numbers of patients are screened, resulting in fewer initial endoscopic procedures.

The method by Giannini and colleagues is simple and easily performed and should be studied by other groups who evaluate large numbers of patients with cirrhosis. If these results are reproduced by further studies, the PC/SD ratio can be recommended as the initial investigation of choice for the detection of EV.

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