

## **Platelet count to spleen volume ratio excludes more oesophageal varices needing treatment than Baveno VI criteria with 100% sensitivity**

Christina Levick, Michael Pavlides, Matthew Robson, Stefan Neubauer, Eleanor Barnes

### **Background and Aims:**

Baveno VI consensus recommendations can reduce unnecessary screening endoscopies for varices needing treatment (VNT; grade 2 or 3, or grade 1 with red sign) in patients with compensated advanced chronic liver disease (cACLD) by only 11 – 33%. This study aims to develop non-invasive strategies to reduce unnecessary endoscopies further through combinations of blood tests, liver stiffness measurement (LSM) and splenic magnetic resonance imaging (MRI). This builds on our previous liver MRI work.

### **Method:**

Forty-nine patients (71% male, mean age  $61 \pm 10$  years) with cACLD of mixed etiologies (35% ALD; 22% NAFLD; 16% viral; 27% other) were assessed with LSM, blood tests and MRI. All had endoscopy screening for VNTs within 1 year of recruitment. MRI scans were analysed for spleen diameter, volume and iron-corrected  $T_1$  ( $cT_1$ ). Baveno VI (platelets  $>150 \times 10^9$  cells/l; LSM  $<20$  kPa), expanded-Baveno VI criteria (platelets  $>110 \times 10^9$  cells/l; LSM  $<25$  kPa), MELD = 6 and platelets  $>150 \times 10^9$  cells/l, and platelet count to spleen size ratios were evaluated. Cut off values for unestablished criteria were selected for 100% sensitivity to detect VNTs.

### **Results:**

The median time between endoscopy and study assessment was 5 days (IQR -12 – 43). Ten (20%) participants had VNTs. LSM was technically impossible in 8% of cases and the XL probe was used in 33%. Only the expanded-Baveno VI criteria missed VNTs (5%). The Baveno VI consensus would have saved 14% of endoscopies, saving fewer than most other criteria tested (table 1). The criteria platelets  $>112 \times 10^9$  cells/l and spleen volume  $<790$  ml would have saved the most endoscopies (53%), with an 18.1 likelihood ratio ( $p < 0.001$ ).

### **Conclusion:**

The Baveno VI consensus saves few screening endoscopies for VNTs, whilst the expanded-Baveno VI criteria misses an unacceptably high proportion of VNTs. More screening endoscopies could be avoided without missing VNTs if platelet count and spleen volume criteria were used. These results require validation in future studies.

### **Figure:**

**Table 1.** Performance of non-invasive criteria to rule out varices needing treatment (n = 49)

Criteria	Endoscopies saved (%)	Likelihood ratio	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
Baveno VI: Plts >150 x10 <sup>9</sup> cells/l, LSM <20 kPa	7 (14)	3.48	24	24	100
Expanded-Baveno VI : Plts>110 x10 <sup>9</sup> cells/l, LSM<25 kPa	16 (33)	1.63	41	26	89
MELD = 6, plts >150 x10 <sup>9</sup> cells/l	4 (8)	1.92	10	22	100
Spleen cT <sub>1</sub> <1244 ms	11 (23)	5.95*	32	27	100
Baveno or spleen cT1 criteria	15 (31)	9.10*	39	30	100
Spleen diameter <138 mm	19 (39)	11.40*	49	33	100
Platelet to spleen diameter ratio <1.267	13 (27)	7.05*	33	28	100
Spleen volume <468 ml	23 (47)	16.92*	59	36	100
Platelet to spleen volume ratio <0.267	25 (51)	18.80*	64	39	100
Plts >112 x10 <sup>9</sup> cells/l, spleen volume <790 ml	26 (53)	18.10*	67	43	100

Abbreviations: Plts, platelets; LSM, liver stiffness measurement; MELD, modified end stage liver disease score

\*p <0.05