

# THE EVALUATION OF THE PROGNOSTIC SCORES IN NON-VARICEAL UPPER GASTROINTESTINAL HEMORRHAGE

I. PRODAN<sup>1</sup>, I. SPOREA<sup>2</sup>

<sup>1</sup> Clinical Emergency Hospital of Sibiu, <sup>2</sup> University of Medicine and Pharmacy „Victor Babes” Timisoara

**Keywords:** non-variceal gastrointestinal haemorrhage, the prognostic scores, the Forrest classification

**Cuvinte cheie:** HDS non-variceală, scoruri prognostice, clasificare Forrest

**Abstract:** The use of the prognostic scores admits a complete evaluation of a patient with upper gastrointestinal haemorrhage and optimise the medical care. Prediction of the risk in patients with upper gastrointestinal bleeding has been the subject of different studies of several decades.

**Rezumat:** Utilizarea scorurilor prognostice permite evaluarea pacientului cu HDS non-variceală și optimizarea îngrijirilor medicale. Predicția riscului de resângere și mortalitate la pacienți cu hemoragie digestivă superioară a fost subiectul multor studii de-a lungul timpului.

## INTRODUCTION

Rokall score is the most used one, it was published by Rockall et al in his article in 1996 and was validated by Vreeburg et al. in 1999 (1), was found efficient in the prediction of the mortality rate, but not in the prediction of repeated bleeding. (2) The Baylor score was developed in 1993 by Saeed et al. as a system of prediction of the re-bleeding rate in the first 72 hours from the hospitalization in the patients with superior digestive hemorrhage that was applied emergency endoscopic therapy with the stop of the hemorrhage and was also validated by Saeed in 1995, on a lot of 47 patients divided in two risk groups: low and high risk. Saeed et al's conclusion was that the score system accurately predicts the risk of re-bleeding of the patients in both groups after the therapeutic success of the first endoscopy. Cedars-Sinai score (Cedars-Sinai Medical Center Predictive Index) was elaborated by Hay et al. in 1996 (4) and uses four variables: the endoscopic aspect, the time that passed since the appearance of the first symptoms of superior digestive hemorrhage, the hemodynamic status, the number of comorbidities. This score system was validated by Hay in 1997 (5) on a lot of 209 patients concluding that the use of this score reduces the hospitalization period of the patients with superior digestive hemorrhage in the lower risk group. The Forrest classification evaluates endoscopically the bleeding lesion, in terms of this the predictability of the lesion of the re-bleeding and mortality may be established (6, 7).

## THE AIM OF STUDY

The comparative analyses of the prognostic scores Rockall, Cedars-Sinai, Baylor considering the identification of the score with the best predictability for re-bleeding, emergency surgical intervention and decease. The analyses of the patient framing from Forrest classes with high risk of re-bleeding and mortality (IA, IB, IIA, IIB) in the risk categories of the prognostic scores (Rockall, Cedars-Sinai, Baylor).

## MATERIAL AND METHODS

We have evaluated prospectively a number of 613

patients with the diagnosis of superior digestive hemorrhage hospitalized in the Gastroenterology and Hepatology Clinic of the Emergency Clinical Hospital in Timisoara during 2007-2010 and we have pursued comparatively the prediction of the risk of re-bleeding, of surgical intervention and mortality for each prognostic score (Rockall, Cedars-Sinai, Baylor).

For each patient at the admission in the hospital an evaluation chart was made with the evaluation parameters of the Rockall, Baylor, Cedars-Sinai scores, the etiological diagnosis and Forrest classification, the endoscopic therapy effectuated, the re-bleeding, the emergency surgical intervention, the evolution and decease. The obtained data were statistically processed with the programme Microsoft Office EXCEL.

## RESULTS

Among the 613 patients that were evaluated 404 patients (66%) were male and 209 female (34%). The rapport between women and men was of 2:1. The main etiology of the superior digestive hemorrhage were ulcerous lesions in 478 patients (77%), gastric neoplasm in 46 patients (8%), with other etiologies 89 patients (15%). The re-bleeding was produced in a number of 12 patients (2,5%). Emergency surgical intervention was a necessity for 6 patients (1,3%). 31 patients (6,4%) died. In the Rockall score the 613 evaluated patients had the following assessment: 22 patients (3,6%) were framed in the low risk category, in the medium risk category 268 patients (43,7%) and in the higher risk category 323 patients (52,7%) (Table no.1). In the Cedars-Sinai score, in the low risk category were 63 patients (10,3%), in the category of medium risk were 194 patients (31,6%), in the high risk category were 356 patients (58,1%) (Table no.1). In the Baylor score the distribution of the patients was the following: at low risk were 148 patients (24,1%), at medium risk were 200 patients (32,6%), at high risk were 265 patients (43,2%) (Table no.1). At the analyses of the patients with upper gastrointestinal bleeding of ulcerous cause in the Forrest classification we have found the next distribution of the patients: in the IA class 37 patients (8%), IB – 63 patients (13%), class IIA – 87 patients (18%), class IIB – 58 patients

<sup>1</sup>Corresponding Author: I. Prodan, Clinical Emergency Hospital of Sibiu, 2-4, Bulevardul Corneliu Coposu street, Sibiu, România; e-mail: liana.prodan@ro.b2i.net; tel +40-0745060243

Article received on 08.05.2011 and accepted for publication on 24.10.2011  
ACTA MEDICA TRANSILVANICA December 2011; 2(4)230-232

## CLINICAL ASPECTS

(12%), class IIC – 72 patients (15%), class III – 169 patients (34%).

**Table no. 1 The distribution of the patients in the Forrest classes and the risk categories of the prognostic scores**

Type of the score	Forrest Classification IA, IB, IIA, IIB (no)	Forrest Classification IA, IB, IIA, IIB (%)
Low Rockall score	0	0,0%
Medium Rockall score	55	22,4%
High Rockall score	190	77,6%
<b>TOTAL Rockall score</b>	<b>245</b>	<b>100,0%</b>
Low CEDARS-SINAI score	0	0,0%
Medium CEDARS-SINAI score	46	18,8%
High CEDARS-SINAI score	199	81,2%
<b>TOTAL CEDARS-SINAI score</b>	<b>245</b>	<b>100,0%</b>
Low Baylor score	31	12,7%
Medium Baylor score	59	24,1%
High Baylor score	155	63,3%
<b>TOTAL Baylor score</b>	<b>245</b>	<b>100,0%</b>

In the category of medium risk of the Rockall score were framed 22,4% of the patients with high risk of re-bleeding and mortality from the Forrest classes IA, IB, IIA, IIB. In the category of medium risk of the Cedars-Sinai score were framed 18,8% from the patients with high risk of re-bleeding and mortality from the Forrest IIA, IIB classes. In the category of medium and low risk of the Baylor score were framed 24,1%, respectively 12,7%, totalize 36,8% of the patients with high risk of re-bleeding and mortality the Forrest IA, IB, IIA, IIB classes.

From the analyze of the re-bleeding in the category of high risk of the Rockall score were situated 83,3% from the patients that had a re-bleeding, in the category of high risk of the Cedars-Sinai score 91,6% and in the category of high risk of the Baylor score were situated 75% of the patients that had a re-bleeding. In the Forrest classes IA, IB, IIA, IIB were situated 91,6% of the patients that presented re-bleeding (Table no.2).

From the analyses of the emergency surgical intervention in the category of high risk of the Rockall score were situated 83,3% of the patients, in the category of high risk of the Cedars-Sinai score were situated 100% of the patients. In

the category of high risk of the Baylor score were situated 83,3% of the patients that needed emergency surgical intervention. In the Forrest classes IA, IB, IIA, IIB were situated 100% of the patients that needed emergency surgical intervention (Table no.2).

In the high risk category of the Rockall score were situated 94,4% of the patients that deceased through upper gastrointestinal bleeding. In the category of high risk of the Cedars-Sinai score were situated 100% of the patients, in the category of high risk of the Baylor score were situated 88,8% of the patients that deceased through upper gastrointestinal bleeding. In the Forrest classes IA, IB, IIA, IIB were situated 61,1% of the patients that deceased through upper gastrointestinal bleeding. In the Forrest classes IIC and III were situated 38,3% of the patients deceased through upper gastrointestinal bleeding and 50% of the patients deceased through comorbidities (Table no.3). From the analyses of deceases through comorbidities, in the category of high risk of the Rockall score were situated 100% of the patients, in the category of high risk of the Cedars-Sinai score were situated 90% of the patients, in the category of high risk of the Baylor score were situated 90% of the patients that deceased through comorbidities. In the Forrest classes IA, IB, IIA, IIB were situated 50% of the patients that deceased through comorbidities (Table no.3).

### DISCUSSIONS

In the effectuated study the re-bleeding produced in a number of 12 patients (2,5%). The emergency surgical intervention was necessary in 6 patients (1,3%). 31 patients have died (6,4%).

Kim et al. in a prospective study following the prediction of the re-bleeding and of the death through the five score system in 239 patients with upper non-variceal gastrointestinal bleeding finds a rate of re-bleeding of 14,6% and a rate of the mortality of 8,4% (8).

Barkun et al. identifies a rate of re-bleeding of 14,1%, of the surgical intervention of 6,5% and of the mortality of 5,4% (9). The Rockall score in the category of high risk identifies 77,6% of the patients with high risk in the Forrest classification (IA, IB, IIA, IIB), 83,3% of the patients with re-bleeding, 83,3% of the patients with emergency surgical intervention, 94,4% from the deceases through upper gastrointestinal bleeding and 100% from the deceases through comorbidities.

**Table no 2. Comparative analyses of the re-bleeding, of the emergency surgical intervention in the categories of high risk**

Forrest Classes Category of high risk	Patients		Re-bleeding		Emergency surgical intervention	
	no	%	no	%	no	%
<b>Forrest classes IA,IB,IIA,IIB</b>	245	50,4%	11	91,6%	6	100,0%
<b>Forrest IIC, III</b>	241	49,6%	1	8,3%	0	0,0%
<b>Total Forrest classes</b>	486	100,0%	12	100,0%	6	100,0%
<b>High Rockall score</b>	265	54,5%	10	83,3%	5	83,3%
<b>High Cedars-Sinai score</b>	276	56,8%	11	91,6%	6	100,0%
<b>High Baylor score</b>	219	45,0%	9	75,0%	5	83,3%

**Table no. 3 Comparative analyses of the deceases in the risk categories and the Forrest classes**

Forrest Class	Deceases through UGIB		Deceases through comorbidities		Total Deceases	
Category of high risk	No	%	no	%	no	%
<b>Forrest Classes IA,IB,IIA,IIB</b>	11	61,1%	5	50%	16	60,0%
<b>Forrest Classes IIC, III</b>	7	38,3%	5	50%	12	40,0%
<b>Total classes Forrest</b>	18	100,0%	10	100,0%	28	100,0%
<b>High Rockall score</b>	17	94,4%	10	100,0%	27	96,4%
<b>High Cedars-Sinai score</b>	18	100,0%	9	90%	27	96,4%
<b>Baylor score</b>	16	88,8%	9	90%	25	89,3%

## CLINICAL ASPECTS

Cedars-Sinai score in the category of high risk identifies 81,2% of the patients with high risk from the Forrest classification (IA, IB, IIA, IIB), 91,6% of the patients with re-bleeding, 100% of the patients with emergency surgical intervention, 100% of the deceases through upper gastrointestinal bleeding and 90% of the deceases through comorbidities. Baylor score in the category of high risk identifies 63,3% of the patients at high risk from the Forrest classification (IA, IB, IIA, IIB), 75% of the patients with re-bleeding, 83,3% of the patients with emergency surgical intervention, 88,8% of the deceases through upper gastrointestinal bleeding and 90% of the deceases through comorbidities. The Forrest classes IA, IB, IIA, IIB were situated 91,6% of the patients that presented re-bleeding, 100% of the patients that needed emergency surgical intervention 61,1% of the patients that deceased through upper gastrointestinal bleeding, 50% of the patients that deceased through comorbidities. In the Forrest classes IIC and III were framed 38,3% of the deceases through upper gastrointestinal bleeding and 50% from the deceases through comorbidities. The Cedars-Sinai score has the best prediction of the rebleeding, the Baylor score has the reduced prediction of the re-bleeding, and the Rockall score has an intermediary prediction. From the point of view of the prediction of the emergency surgical intervention the Cedars-Sinai score has the best predictability, the Rockall and Baylor score have a prediction that is inferior to this one. The Forrest classification identifies accurately the cases of re-bleeding, having a good predictability, 91,6% of the patients with re-bleeding in the Forrest classes IA, IB, IIA, IIB. In the analysed lote the Rockal and Cedars-Sinai score have the same prediction of the mortality, and the Baylor score has an inferior prediction compared to the one of the Rockal and Cedars-Sinai score. Nicholas I. Church and the collaborators in a randomized study with 247 patients with upper gastrointestinal bleeding of ulcerous cause, effectuated in Great Britain and published in the *Gastrointestinal Endoscopy* finds re-bleeding post-endoscopic therapy in a number of 36 patients, representing (15%) of the total patients, at the value of 4 of the Rockall score the re-bleeding is present in 3 patients (6%) among 20 with this score and at the value 5 of the score at 8 patients (15%) among 54 patients (10). Remarkable in this study is the Rockall score range 3-5 had re-bleeding 11 among 36 patients representing 30,5%. In our study in the medium Rockall score range 3-5 presented re-bleeding 16,6% patients among the total number of the patients with re-bleeding.

Two studies realised separately one by Vreeburg et al., the other one by Church and Palmer concluded that the Rockall score although has a good predictability of the mortality, its prediction linked to the re-bleeding is unsatisfactory. (2,11,12). The deficiency of the prediction of the re-bleeding of the Rockall score that we have observed in this study we consider it the result of the suboptimal framing in the category of high risk of the patients in the Forrest classes IA, IB, IIA, IIB, considered with high risk of hemorrhage. Benavides et al. in 2006 follows the validation of the Cedars-Sinai score for the prediction of the re-bleeding and of the mortality finds a rate of re-bleeding of 8,4% and a rate of mortality of 4,2%. In the category of low risk of the Cedars-Sinai score there weren't events, in the category of medium risk the events were present at 7,25% patients, in the category of high risk at 13,2% patients. The authors conclude that the Cedars-Sinai score is adequate in the prediction of the re-bleeding and of the mortality in patients with upper non-variceal gastrointestinal bleeding (13).

## CONCLUSIONS

1. In the effectuated study, the Cedars-Sinai score had the best

prediction of the re-bleeding, the Baylor score the lower prediction of the re-bleeding, the prediction of the Rockall score is intermediary.

2. In the effectuated study, from the point of view of the prediction of the emergency surgical intervention Cedars-Sinai score has the best predictability, the Rockall and Baylor score have an inferior prediction compared to the Cedars-Sinai score.
3. In the analysed lot the Rockal and Cedars-Sinai score have the same prediction of mortality, and the Baylor score has an inferior prediction.
4. The best predictability of the events consisting in re-bleeding, emergency surgical intervention and decease is done by the Cedars-Sinai score.
5. The Forrest classification is the best predictor of re-bleeding and emergency surgical intervention.

## BIBLIOGRAPHY

1. Rockall TA, Logan RF, Devlin HB, Northfield TC. Risk assessment after acute upper gastrointestinal haemorrhage. *Gut*. 1996;38:316-21. [PMID:8675081]
2. Vreeburg EM, Terwee CB, Snel P, Rauws EA, Bartelsman JF, Meulen JH, Tytgat GN. Validation of the Rockall risk scoring system in upper gastrointestinal bleeding. *Gut*. 1999; 44:331-5.
3. Villanueva C et al, Value of second look endoscopy after injection therapy for bleeding peptic ulcer: a prospective and randomized trial. *Gastrointest.Endosc.* 1994;40:34-39 [PMID 8163132]
4. Palmer K. Acute upper gastrointestinal haemorrhage. *British Medical Bulletin* 2007;83:307-324.
5. Huang C. S. et al. Nonvariceal upper gastrointestinal bleeding, *Gastroenterol Clin N Am* 2003; 23: 1053-54
6. Laine L at al. Bleeding peptic ulcer, *N Engl J Med* 1994, 311: 717-727.
7. Forrest JA, Finlayson ND, Shearman DJ. Endoscopy in gastrointestinal bleeding. *Lancet* 1974;2:394-7.
8. Kim BJ, Park MK, Kim SJ, Kim ER, Min BH, Son HJ et al. Comparison of scoring systems for the prediction of outcomes in patients with nonvariceal upper gastrointestinal bleeding: a prospective study. *Digestive Disease and Science*. 2009;54(11):2523-9.
9. Barkun A, Sabbah S, Enns R, Armstrong D, Gregor J, Fedorak R. N.N. et al. The Canadian Registry on Nonvariceal Upper Gastrointestinal Bleeding and Endoscopy (RUGBE): Endoscopic Hemostasis and Proton Pump Inhibition Are Associated With Improved Outcomes in a Real-Life Setting. *The American Journal Gastroenterology*. 2004;99(7)
10. Church NI, Dallal HJ, Masson J, Mowat NA, Johnston DA, Radin E, et al. Validity of the Rockall scoring system after endoscopic therapy for bleeding peptic ulcer: a prospective cohort study. *Gastrointest Endosc.* 2006;63:606-12. [PMID: 16564860]
11. Harris A. *Handbook of gastrointestinal emergencies*. Life science communications. London, 2002.
12. Church NI, Palmer KR. Relevance of the Rockall score in patients undergoing endoscopic therapy for peptic ulcer haemorrhage. *Eur J Gastroenterol Hepatol* 2001;13:1149-52.
13. Benavides CF, Cardenas VG, Marquez MR, Revilla LJ. Validation of cedars-sinai score in the prediction of rebleeding and mortality in non variceal upper gastrointestinal hemorrhage. *Rev. Gastroenterol Peru*. 2006;26(2):128-37.