

CORRELATION OF ADJUSTED BLOOD REQUIREMENT INDEX WITH TREATMENT INTERVENTION AND OUTCOME IN PATIENTS PRESENTING WITH ACUTE VARICEAL BLEEDING

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ABSTRACT

Objective: To determine the correlation of ABRI with treatment intervention and outcome as discharged or expired in patients of acute variceal bleed.

Design: Cross-sectional study

Patients and Methods: Records of all the patients admitted in Medical Unit-IV, Civil Hospital Karachi with acute variceal bleeding during January 2004 to October 2006 were retrieved. Use of vasoactive agents (Terlipressin/Octreotide), endoscopic band ligation (EBL) and outcome (Discharged/Expired) were noted. ABRI was calculated by the following formula:

$$\text{ABRI} = \frac{\text{Blood Units Transfused}}{[(\text{Final Hematocrit} - \text{Initial Hematocrit}) + 0.01]}$$

Mean ABRI were compared by Student's 't' test according to vasoactive therapy, EBL and outcome. Correlation of ABRI with the same variables was also studied by plotting Receiver Operative Curves (ROC). **Results:** Seventy six patients fulfilling inclusion criteria were selected. No statistically significant difference was observed in the mean ABRI scores when compared according to vasoactive drug administration, EBL and outcome. Significant correlation with mortality was seen on ROC plot with significantly larger area under the curve.

Conclusion: ABRI correlated significantly with mortality in this study. Larger prospective studies with appropriate power are required to evaluate its association with other variables.

Key Words:

Varices, Hematemesis, Portal Hypertention, Cirrhosis

INTRODUCTION

Cirrhosis is common in this part of the world and so are its complications¹⁻³. About 40% of the patients of compensated cirrhosis and 60% of decompensated cirrhosis have varices⁴. Bleeding from varices carries a high mortality⁵. Despite advancements in management the mortality rate is still about 20% from the first variceal bleed⁵⁻⁷. Highest risk of mortality is present during the first 5 days of an episode of bleed with gradual decline in risk over the period of 4-6 weeks⁸.

Many criteria and definitions to evaluate failure to control and prevent variceal bleed were developed in Baveno Consensus Workshops I-III⁹⁻¹². Those were later found out to be of limited clinical value in subsequent clinical trials and failed to gain popularity in clinical practice¹³. This led to the development of new criteria in Baveno-IV workshop in which an independent factor of Adjusted Blood Requirement Index (ABRI) was added. ABRI value of ≥ 0.75 at any point time was defined as failure of variceal bleed control. ABRI has been suggested as an independent criterion to determine failure to control variceal bleeding¹⁴.

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ABRI has not been tested in our settings. We conducted this study to evaluate the ABRI and to correlate it with the treatment interventions and outcomes in acute variceal bleeding.

PATIENTS AND METHODS

This cross sectional study was conducted in Medical Unit-IV, Civil Hospital Karachi associated with Dow University of Health Sciences, from January 2004 to October 2006. Records of all the patients admitted with acute variceal bleeding were retrieved. Patients with hepatocellular carcinoma, associated peptic ulcer and upper gastrointestinal (GI) malignancies were excluded.

Data were extracted on a specially designed proforma which included fields for hemoglobin and hematocrit on admission and on discharge/expiry, number of blood units transfused during admission, use of vasoactive agents (terlipressin/octreotide), endoscopic band ligation (EBL) and outcome (discharged/expired) were recorded. Child's Class of the patients were determined. ABRI was calculated by the following formula¹³:

$$ABRI = \frac{\text{Blood Units Transfused}}{[(\text{Final Hematocrit} - \text{Initial Hematocrit}) + 0.01]}$$

Continuous variables were compared for the difference of means by Student's 't' test. Means \pm standard deviation (SD) were calculated for hemoglobin and hematocrit on admission and discharge/expiry. Mean ABRI were compared by 't' test according vasoactive therapy, EBL and outcome. Correlation of ABRI with the same variables was also studied by plotting Receiver Operative Curves (ROC). SPSS version 15.0 was used for statistical analysis.

RESULTS

Seventy six patients fulfilling the inclusion criteria were selected. The rest were excluded due to incomplete data (18), hepatocellular carcinoma (2) and associated peptic ulcer (1).

The mean \pm SD of hemoglobin, hematocrit, blood pack transfused and ABRI are given in Table I. Details of Child's Class with outcome is given in Table II. Octreotide was given in 63 (82.9%) patients while 13 (17.1%) patients received terlipressin. The mean ABRI value in patients who received octreotide was 0.25 ± 6.08 while that in patients who received terlipressin was 1.09 ± 1.03 't' test did not reveal any significant difference of ABRI values between the two group (95% CI -4.22 to 2.56; P = 0.63).

Table 1: Mean \pm Standard deviation of continuous variables

	Mean	\pm SD
Hemoglobin on Admission	5.8	2.2
Hematocrit on Admission	19.1	7.1
Hemoglobin on Discharge/Expiry	6.7	2.1
Hematocrit on Discharge/Expiry	21.9	6.9
No. of Transfusions	2.6	1.1
ABRI	0.4	5.6

Table 2: Cross tabulation of Child's Class with Outcome

Child Class	Outcome		Total
	Discharge	Expired	
Child Class A	4 (100)	0 (0)	4(5.3)
Child Class B	32 (97)	1 (3.0)	33 (43.4)
Child Class C	3 (7.7)	36 (92.3)	39 (51.3)
Total	39 (51.3)	37 (48.7)	76

EBL was done in 22 (28.9%) of patients. ABRI in patients in whom EBL was done was 0.37 ± 2.12 while in patients in whom EBL was not done it was 0.41 ± 6.47 . No statistically significant difference was found between the two (95% CI -2.78 to 2.86; P = 0.98). Thirty nine patients (51.3%) were discharged from the hospital and 37(48.7%) expired. ABRI values for those who were discharged from the hospital were 0.60 ± 7.42 while its value in those who expired was 1.45 ± 1.99 . The difference did not reached the statistical significance (95% CI -4.56 to 0.47; P = 0.11).

The ROC graphs were plotted to study the correlation of ABRI with vasoactive drugs, EBL and outcome.

Significant correlation ABRI was determined only with mortality. Area under the curve was 0.64, 95% CI 0.52 to 0.77 and P = 0.031. ROC plot of ABRI with mortality is shown in Figure 1.

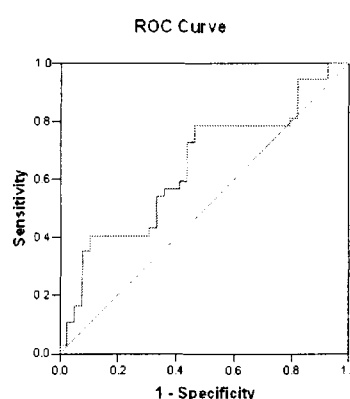


Figure 1: ROC Curve of ABRI with Mortality.

DISCUSSION

Many criteria were developed for assessment of bleeding control in various Baveno Consensus Workshops^{11, 15}. The goals of the Baveno workshops were to develop consensus definitions of key events related to portal hypertension and variceal bleeding, and to produce guidelines to facilitate the conduct and reporting of clinical trials. The consensus definitions concern the diagnosis of active bleeding, failure to control bleeding, the criteria to distinguish continuing bleeding from re-bleeding, and the means of assessing failure to prevent rebleeding¹⁶. Earlier Baveno I to III workshops failed to achieve those objectives and were modified in Baveno IV Consensus Workshop¹³. The criteria of failure to arrest variceal bleeding included fresh hematemesis =2 hours after start of treatment, 30 g drop in hemoglobin (~9% drop in hematocrit) if no transfusion is administered, death and ABRI =0.75 at any time point¹³. Baveno IV criteria were recently modified for application to pediatric population with portal hypertension¹⁷.

In this study we tried to independently assess the values of ABRI with various variables. The results showed higher values of ABRI in patients who received terlipressin as compared to octreotide but it was not statistically significant. Similarly significance was not found when ABRI values were compared for EBL and outcome. The only significance was found in its correlation with mortality on ROC curve with significantly larger area under the curve for mortality.

The only other evaluation of ABRI done has shown low congruence between ABRI and other Baveno criteria and the incidence of treatment failure was reportedly higher than the previously reported frequencies of early re-bleeding. The authors were of the opinion that the criterion related to the quantity of blood transfusions was not a reliable indicator of treatment failure¹⁴.

This study showed correlation with number of blood transfusion. It correlated well by giving higher scores to patients who expired. Being a public sector hospital patients were received in usually more serious condition as 39 were in Child's Class C who were unfit to under go EBL. This is also the reason that the mortality rate in this study was on the higher side.

The limitations of this study include a retrospective analysis with comparatively limited sample size. Although

it provided baseline data about ABRI correlation with different variables, prospective studies with appropriate power and sample size should be conducted to validate this new easy to use tool.

CONCLUSIONS

ABRI correlated significantly with mortality in this study. No significant difference of ABRI values was found between the different treatment modes.

DISCLAIMER

The study did not receive any financial support nor do any of the authors have any conflict of interest financial or otherwise for disclosure.

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