

Highly elevated C-reactive protein levels have significant prognostic value in patients with complicated intra-abdominal infections

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Introduction

Complicated intra-abdominal infections (cIAs) are still associated with unacceptably high mortality rates. Early prognostic evaluation of cIAs could help to define the aggressiveness of conservative treatment and surgical management. Despite the routine clinical use of C-reactive protein (CRP), few studies have investigated its high elevation as prognostic factor in cIAs. We aimed to evaluate highly elevated CRP levels as predictor of survival in patients with cIAs.

Results

Of the 78 enrolled patients twenty (25.6%) died during hospitalization. ROC Curve analysis revealed CRP as the best mortality predictor (Figure 1). The pairwise comparison of ROC curves showed prognostic superiority of CRP compared to WBC and SIRS, and comparability to qSOFA and Neu in outcome prediction (Table 1). The identified sensitivity and specificity for CRP cut-off value = 208.5 mg/L were 75.0% and 81.03%, respectively (Table 2).

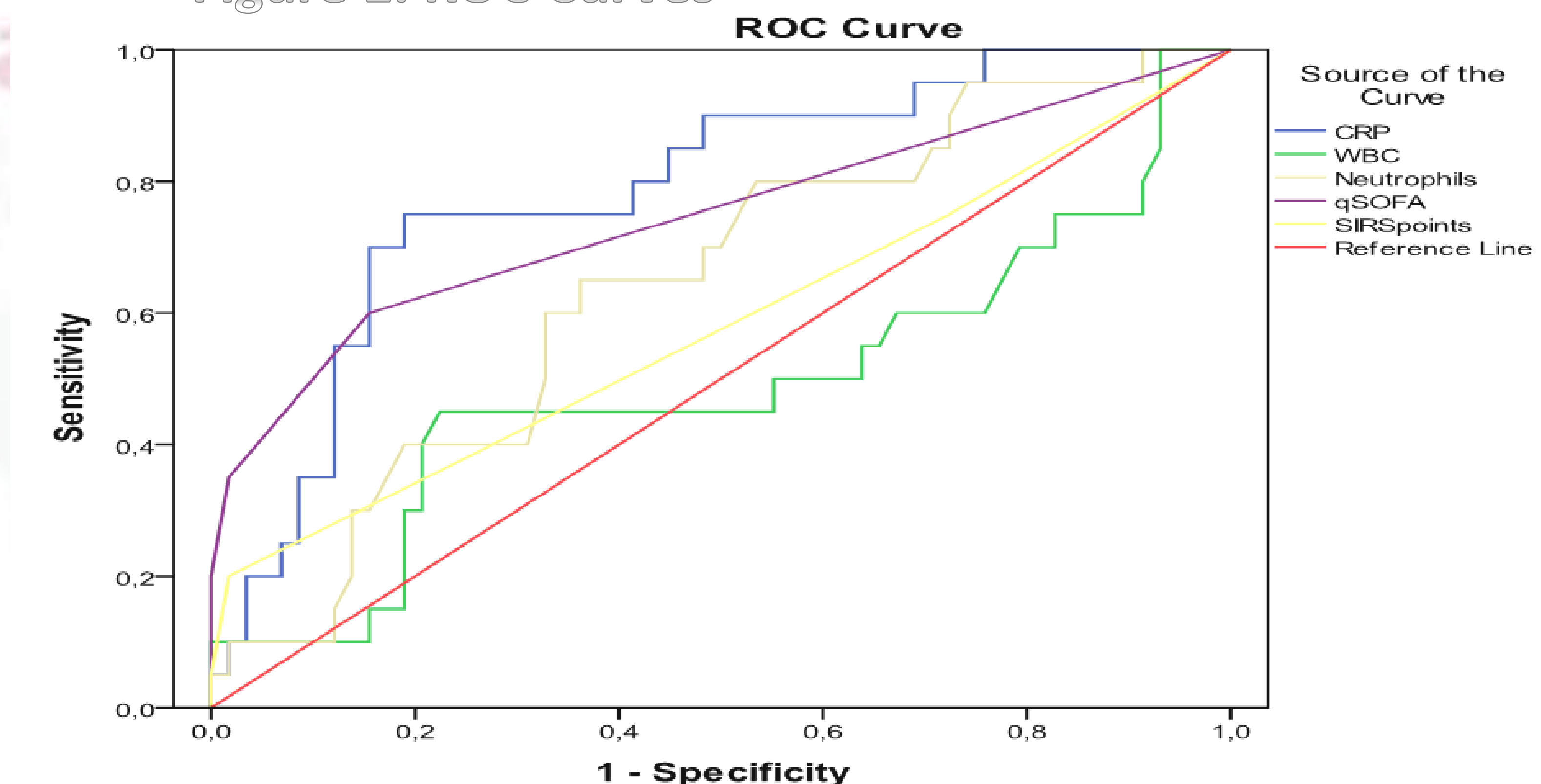
Table 1. Pairwise comparison of ROC Curves

	CRP ~ WBC	CRP ~ Neu	CRP ~ qSOFA	CRP ~ SIRS
Difference between areas	0.276	0.144	0.0409	0.208
Standart Error ^c	0.118	0.0962	0.0825	0.0968
95% CI	0.0446-0.508	-0.0451-0.332	-0.121-0.203	0.0184-0.398
Significance	p = 0.0194	p = 0.1358	p = 0.6195	p = 0.0315

Table 2. Sensitivity, Specificity and AUROCs

Variable	Cut-off value	Sensitivity,%	Specificity,%	AUROC
CRP	208.5 mg/L	75.0	81.03	0.787(0.680-0.872)
WBC	12.01x10 ⁹ /L	55.0	50.0	0.511(0.395-0.626)
Neu	81.4%	65.0	63.7	0.644 (0.527-0.749)
qSOFA	≥ 2 points	35.0	98.28	0.746 (0.635-0.838)
SIRS	≥ 2 points	40.0	72.41	0.579 (0.462-0.690)

Figure 1. ROC Curves



Material and methods

The retrospective study involved 78 patients with cIAs admitted to Department of Surgical Diseases at a University Hospital Stara Zagora. All patients >18 years from January 2017 to October 2018 presented to Emergency Department(ED) that required emergency surgery were included in the study. CRP concentrations, white blood cells (WBC) count, percentage of neutrophils (Neu), qSOFA score and SIRS criteria were determined at admission. We compared the prognostic performance of CRP, WBC, Neu, qSOFA score and SIRS criteria using area under receiver operating characteristics (AUROC) curves and analyzed the coordinates of the curves.

Conclusion

We found highly elevated CRP levels alone as a good prognostic biomarker in patients with complicated intra-abdominal infections.

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