Predictors of Poor Outcomes in Acute Forearm Compartment Syndrome

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Purpose: There is limited literature risk-stratifying patients with acute forearm compartment syndrome. The primary objective of this study is to identify predictors for poor outcomes in patients with acute forearm compartment syndrome.

Methods: In this IRB-approved retrospective study, we identified 130 patients with acute compartment syndrome of 130 forearms treated with fasciotomies from January 2000 to June 2015 at 2 Level-I trauma centers. Poor outcome was defined as a composite variable, including (1) death, (2) limb amputation, (3) persistent neurologic deficit, and (4) contracture. Electronic medical records were analyzed for patient-related factors and treatment-related factors. Bivariate analyses were used to screen for variables associated with poor outcome, and explanatory variables with a P value below 0.05 were included in our multivariable logistic regression analyses.

Results: 43 out of 130 patients (33%) with acute forearm compartment syndrome had poor outcomes, including 5 deaths, 5 limb amputations, 21 persistent neurologic deficits, and 31 contractures. Multivariable logistic regression analyses showed that elevated serum creatine kinase at presentation ($P < 0.05$) was associated with poor outcomes in patients with acute forearm compartment syndrome. ROC (receiver operating characteristic) curve analysis showed that a serum creatine kinase cutoff of 300 U/L yields 92% sensitivity and a serum creatine kinase cutoff of 10,000 U/L yields 95% specificity for poor outcomes in acute forearm compartment syndrome.

Conclusion: Serum creatine kinase level above 300 U/L is a sensitive predictor and above 10,000 U/L is a specific predictor of poor outcomes in acute forearm compartment syndrome. Elevated creatine kinase levels above 300 U/L is a useful screening test for the highest risk patients with acute forearm compartment syndrome. Levels above 10,000 U/L may play a role in informed consent and counseling regarding expectations.

POSTER ABSTRACTS

Table: Sensitivity, specificity, and AUC of serum creatine kinase on presentation as a predictor of poor outcome in acute forearm compartment syndrome

Serum creatine kinase level (U/L) cutoff	Sensitivity (%)	Specificity (%)	AUC (%)
100	97	4	41
300	92	35	58
1,000	65	73	70
3,000	54	82	71
10,000	43	95	74
30,000	30	98	70
100,000	5	100	61