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C-reactive protein as a predictor of posttraumatic stress induced by acute myocardial infarction

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Abstract: **BACKGROUND:** Acute coronary syndrome (ACS) may cause clinically relevant posttraumatic stress disorder symptoms (PTSS). An inflammatory state might be one mechanism linking PTSS with poor prognosis after ACS. We tested the hypothesis that a change in C-reactive protein (CRP) between hospital admission and 3-month follow-up is an independent predictor of ACS-triggered PTSS. **METHODS:** We assessed 183 patients (median age 59 years; 84% men) with verified myocardial infarction (MI) within 48 h of an acute coronary intervention and three months post-MI for self-rated PTSS. 14 (7.7%) patients fulfilled definition criteria for PTSS caseness. CRP values were categorized according to the predicted risk of cardiovascular disease (CVD) at hospital admission (acute inflammatory response): 0 to <5 mg/L, 5 to <10 mg/L, 10 to <20 mg/L, and ≥ 20 mg/L; and at 3-month follow-up (low-grade inflammation): 0 to <1 mg/L, 1 to <3 mg/L, and ≥ 3 mg/L. Additionally, in a subsample of 84 patients with CRP levels below 20 mg/L at admission, CRP values were log-transformed. **RESULTS:** After adjustment for covariates, less of a reduction or an increase of log CRP values between admission and 3-month follow-up predicted PTSS caseness (OR 6.25, 95% CI 1.25, 31.38), and continuous PTSS (unstandardized B = 0.21, 95% CI 0.07, 4.19; p = 0.043). Less reduction in CRP risk categories predicted both PTSS caseness (OR 4.14, 95% CI 1.89, 9.06) and continuous PTSS (B = 1.80, 95% CI 1.09, 2.51; p < 0.001). **CONCLUSIONS:** Persistently heightened inflammation seems to be predictive for the development of PTSS three months after ACS, so interventions to lower inflammation might be warranted.

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Table 3: Predicting the presence of CRP risk levels by ASDS in acute response to myocardial infarction

CRP ≥20mg/L

Variables	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
ASDS sum score	1.05 (1.01-1.09)*		--	--	
Dissociation score		1.11 (1.00-1.24)*		--	
Re-experiencing score		--	0.93 (0.80-1.09)	--	
Avoidance score		--	--	1.25 (1.08-1.46)**	
Arousal score		--	--		1.14 (1.02-1.29)*
Demographics					
Male Gender	4.00 (1.36-11.81)*	3.61 (1.18-11.04)*	4.10 (1.35-12.47)*	4.93 (1.63-14.93)**	4.25 (1.44-12.50)**
Age	1.02 (0.96-1.08)	1.02 (0.96-1.08)	1.02 (0.82-1.27)	1.03 (0.97-1.10)	1.02 (0.96-1.08)
Education	0.47 (0.22-0.98)*	0.48 (0.23-0.1.01) [†]	0.49 (0.23-1.04)	0.46 (0.22-0.99)*	0.46 (0.22-0.96)**
Social support	1.04 (0.96-1.13)	1.02 (0.94-1.11)	1.04 (0.96-1.13)	1.06 (0.97-1.16)	1.04(0.96-1.14)
Smoking	1.07 (0.66-1.72)	0.99 (0.6-1.60)	1.13 (0.70-1.81)	1.19 (0.73-1.94)	1.10 (0.68-1.77)
Alcohol risk	1.03 (0.61-1.76)	1.00 (0.59-1.70)	1.04 (0.61-1.75)	1.05 (0.62-1.78)	1.03 (0.61-1.75)
Body mass index	1.14 (1.04-1.24)**	1.13 (1.03-1.24)**	1.13 (1.03-1.23)*	1.14 (1.04-1.25)**	1.15 (1.04-1.26)**
Physical activity	0.76 (0.47-1.23)	0.84 (0.52-1.35)	0.73 (0.45-1.18)	0.72 (0.44-1.18)	0.70 (0.43-1.14)
STEMI	1.40 (0.50-3.91)	1.38 (0.50-3.81)	1.58 (0.57-4.35)	1.81 (0.63-5.24)	1.47 (0.53-4.11)
GRACE score	1.01 (0.99-1.04)	1.01 (0.98-1.04)	1.02 (0.99-1.05)	1.01 (0.98-1.04)	1.02 (0.99-1.04)

LVEF	0.96 (0.92-1.00)*	0.96 (0.92-1.00) ^t	0.97 (0.93-1.00)	0.96 (0.92-1.00)*	0.96 (0.92-1.00)*
Troponin T	1.05 (0.94-1.16)	1.04 (0.94-1.15)	1.04 (0.94-1.15)	1.05 (0.94-1.17)	1.04 (0.94-1.16)
WBC count	1.30 (1.06-1.58)*	1.34 (1.10-1.64)**	1.33 (1.09-1.62)**	1.26 (1.02-1.54)*	1.29 (1.06-1.57)*
Intervention	0.85 (0.41-1.78)	0.78 (0.37-1.62)	1.01 (0.49-2.08)	0.96 (0.46-2.01)	0.89 (0.43-1.85)
Acute pain	1.05 (0.84-1.32)	1.03 (0.83-1.29)	1.02 (0.82-1.27)	1.06 (0.84-1.33)	1.06 (0.85-1.33)

Notes: CRP, C-reactive protein; GRACE, Global Registry of Acute Coronary Events; LVEF, Left ventricular ejection fraction; STEMI, ST-elevation myocardial infarction; WBC, white blood cell; CI= Confidence interval, OR=Odds Ratios adjusted for demographics, CI that do not include 1.00 indicate a significant OR at $p < 0.05$, significant OR are in **bold**, *=significance (two sided), $p < .05$, **=significance (two sided), $p < .01$, ***=significance (two sided), $p < .001$; ^t=significance (two sided), $p < .06$.