

Abstract: Prodromal symptoms associated with acute coronary syndrome – acute symptom presentation

Objective

Prodromal symptoms (PS), indicative of myocardial ischemia, are frequently unrecognized by individuals prior to an acute coronary syndrome (ACS). ACSs are the leading cause of death worldwide. This study describes (1) the prevalence and association of PS with patients' baseline ACS-related acute symptoms of pain intensity and state anxiety and (2) the relationship of PS to co-morbidity.

Methods

An exploratory sub-analysis was performed. Cross sectional data identified prodromal predictors of ACS pain intensity (numeric rating scale 0–10 (NRS)) and state anxiety (Speilberger state-trait anxiety personality inventory (STAI)). ACS patients ($n=121$) admitted to a community rural emergency department completed the prodromal symptom screening scale (PS-SS) and reported baseline cardiac pain intensity, state, and trait anxiety.

Results

Increased ACS pain intensity was associated with PS. Median pain scores were higher by two points for those with prodromal headache, $p=0.006$, and anxiety, $p=0.017$, and one point higher for those with sleep disturbances, $p=0.012$. PS were not associated with state or trait anxiety. Hypertensive individuals were 7.5 times more likely to experience prodromal fatigue prior to their ACS event.

Conclusion

Results extend current knowledge of the predictive value that prodromal headache, sleep disturbance and anxiety may have on individuals' acute symptom presentation. A prospective, prognostic study is required in order to determine whether PS are predictive of adverse cardiac events and if PS are a stronger predictor of ACS acute symptom presentation, compared with typical ACS-related co-morbidities.



Table 1 Association of PS with cardiac pain intensity, state and trait anxiety [unadjusted]

Symptom	Baseline pain intensity		State anxiety		Trait anxiety	
	Mean (SD)	P-value*	Mean (SD)	P-value	Mean (SD)	P-value
Unusual aches		0.520		0.500		0.397
Yes	1.9 (2.5)		44.5 (6.4)		48.5 (4.6)	
No	2.0 (2.3)		45.3 (6.0)		47.6 (5.6)	
Unusual fatigue		0.673		0.642		0.650
Yes	2.0 (2.4)		44.7 (6.1)		47.8 (5.3)	
No	1.9 (2.3)		45.2 (6.3)		48.2 (5.1)	
Sleep disturbances		0.012		0.613		0.653
Yes	2.5 (2.5)		44.7 (6.3)		48.3 (5.0)	
No	1.6 (2.2)		45.3 (5.9)		47.9 (5.3)	
Headaches		0.006		0.660		0.373
Yes	3.2 (3.0)		45.4 (5.8)		48.7 (5.6)	
No	1.6 (2.0)		44.8 (6.3)		47.7 (5.1)	
Dizziness		0.607		0.153		0.268
Yes	2.0 (2.3)		46.0 (5.3)		48.6 (5.0)	
No	1.9 (2.4)		44.3 (6.6)		47.5 (5.3)	
Shortness of breath		0.341		0.203		0.224
Yes	2.1 (2.5)		45.5 (6.0)		48.4 (5.5)	
No	1.7 (2.3)		44.0 (6.3)		47.2 (4.6)	
Chest pain		0.397		0.405		0.517
Yes	2.1 (2.4)		45.2 (5.8)		48.2 (4.8)	
No	1.7 (2.2)		44.2 (7.0)		47.5 (6.2)	
Anxiety		0.017		0.889		0.686
Yes	2.4 (2.4)		45.0 (6.0)		48.1 (5.8)	
No	1.4 (2.2)		44.8 (6.4)		47.7 (4.2)	
Other		0.780		0.143		0.400
Yes	1.8 (2.1)		45.7 (6.2)		47.6 (4.6)	
No	2.2 (2.6)		44.0 (6.0)		48.4 (5.8)	

*Non-parametric Wilcoxon rank-sum test.

Table 2 Prevalence of PS between Women and Men

Symptom	Overall	Female	Male	p-value for differences across sex*
Presence vs Absence	N (%)	N (%)	N (%)	
Unusual aches	49 (40.8)	26 (41.9)	23 (39.7)	0.800
Unusual fatigue	64 (53.3)	34 (54.8)	30 (51.7)	0.733
Sleep disturbances	44 (37.0)	23 (37.1)	21 (36.8)	0.977
Headaches	31 (25.8)	14 (22.6)	17 (29.3)	0.400
Dizziness	46 (38.3)	22 (35.5)	24 (41.4)	0.507
Shortness of breath	74 (61.7)	38 (61.3)	36 (62.1)	0.930
Chest pain	85 (70.8)	42 (67.7)	43 (74.1)	0.441
Anxiety	70 (58.3)	38 (61.3)	32 (55.2)	0.497
Other	65 (54.2)	34 (54.8)	31 (53.5)	0.879

*Chi-square test for association.
Other: gastric complaints of (nausea, indigestion, heartburn) and reports of-diaphoresis, palpitations, arm numbness, blurred vision, and confusion).

Table 3 Association of cardiac prodromal symptoms and comorbidity

Symptom	Diabetes		Hypercholesterolemia		Hypertension	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Unusual aches/pain (Y vs N)	2.32 (0.95, 5.66)	0.066	0.58 (0.26, 1.32)	0.196	0.61 (0.25, 1.50)	0.285
Unusual fatigue (Y vs N)	1.05 (0.42, 2.63)	0.920	1.74 (0.75, 4.06)	0.198	7.57 (2.77, 20.67)	<0.001
Sleep disturbances (Y vs N)	0.50 (0.19, 1.36)	0.175	1.19 (0.49, 2.86)	0.703	0.39 (0.15, 1.05)	0.063
Headaches (Y vs N)	0.96 (0.34, 2.66)	0.932	1.60 (0.62, 4.14)	0.331	0.71 (0.25, 2.01)	0.518
Dizziness (Y vs N)	1.01 (0.40, 2.55)	0.984	0.95 (0.41, 2.23)	0.908	0.53 (0.21, 1.36)	0.186
Shortness of breath (Y vs N)	1.30 (0.50, 3.38)	0.585	1.09 (0.47, 2.56)	0.836	2.11 (0.84, 5.27)	0.112
Chest pain (Y vs N)	0.99 (0.35, 2.79)	0.988	0.58 (0.23, 1.49)	0.258	0.65 (0.24, 1.77)	0.402
Anxiety (Y vs N)	1.10 (0.45, 2.70)	0.934	0.65 (0.29, 1.46)	0.296	0.65 (0.27, 1.57)	0.334
Other (Y vs N)	0.95 (0.36, 2.49)	0.909	0.64 (0.27, 1.54)	0.322	0.64 (0.25, 1.67)	0.360

CI: confidence interval; N: No; OR: odds ratio; Other: gastric complaints (nausea, indigestion, heartburn) and reports of diaphoresis, palpitations, arm numbness, blurred vision, and confusion); Y: yes. Confounders controlled for: ACS (UA or NSTEMI), age, sex, marital status, baseline troponin-I level, baseline trait anxiety, hypertension, diabetes, persistent pain, peptic ulcer/esophageal reflux, hypercholesterol, and medication.

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