

The Effect of Patient Characteristics, Presenting Symptoms and Media Campaigns on Prehospital Delay in MI Patients: A Prospective Cohort Study

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The Team

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Conflict of Interest

Professor Peter Thompson has received:

Research funding: Astra Zeneca, Pfizer, Amgen, Boehringer Ingelheim, Amarin, St Jude Conference travel

Conference travel: Amgen

Speaker fees: Astra Zeneca, Pfizer



Background – CV disease

- Cardiovascular disease is the leading cause of death in Australia¹ and worldwide²
 - In Australia (2012-13) over 46,000 patients were hospitalised with a myocardial infarction (MI)³
 - MI in 2015, claimed 8,433 lives, an average of 23 each day¹
 - Rapid reperfusion of an obstructed coronary artery is associated with improved survival
 - This intervention is time-critical and delays to treatment must be minimised

[1] Australian Bureau of Statistics. Causes of Death, Australia. Available at: <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3303.0Main+Features12015?OpenDocument>
Accessed Feb 9 2017.

[2] World Health Organisation. Cardiovascular diseases (CVDs). Available at: <http://www.who.int/mediacentre/factsheets/fs317/en/> Accessed Feb 9 2017.

[3] Australian Institute of Health and Welfare. Cardiovascular disease, diabetes and chronic kidney disease. Available at: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129549107> Accessed March 7 2015.



Background – Prehospital Delay

- Prehospital delay
 - Or patient decision delay, the time from symptom onset to arrival in ED
- Median prehospital delays among patients with MI are between 2 – 4.25 hours
- Studies have shown improved survival for STEMI and survival for very high risk NSTEMI is greatest if reperfusion is early (90 to 120 minutes) after symptom onset.

Background – Symptoms of MI

- Symptom profile and correct identification of symptoms are early important early indicators of the need to seek care
- MI warning signs
 - Chest pain / discomfort, light headedness, N & V, jaw / neck / back / arm / shoulder pain, SOB & collapse
- If these warning signs are experienced, the ambulance should be called immediately
 - Usually the quickest mode to hospital
 - Paramedics can treat life-threatening arrhythmias if they occur
 - Arriving by ambulance → faster treatment in the ED



Background – National Mass Media Campaigns

- A recent review⁴ showed 2/7 studies that used a national mass media campaign reduced pre-hospital delay.
- The National Heart Foundation of Australia has a long history of conducting mass media campaigns
 - The most recent campaign was the ‘warning signs of heart attack’
 - It focused on reducing delay in responding to the warning signs of MI and the importance of calling an ambulance

[4] Moc
why? E



i, Fealy G, O'Brien F, O'Donnell S, Moser D. A review of interventions aimed at reducing pre-hospital delay time in acute coronary syndrome: what has worked and Nurs. 2012;11:445-53.

Aims

The primary aims were:

1. Describe the prehospital delay time of patients diagnosed with MI who arrived by private transport or ambulance;
2. Identify patient characteristics and presenting symptoms of MI that contribute to this delay;
3. Assess the impact of the Australian NHF media campaign with prehospital delay.



Methodology

- Study design, participants & setting
- Prospective cohort study
- Participants
 - MI patients (diagnosis confirmed by medical chart review and abnormal elevation in troponin)
 - ≥ 18 years
 - Fluent in English
 - Cognitive capacity to provide consent
- Setting
 - SCGH hospital



Data sources

- EDIS
- iSoft
- Medical chart (Comorbid conditions, previous PCI, CABG, type of MI)
- Symptoms of Acute Coronary Syndromes Inventory (SACSI)
 - Based on extensive literature review, reliable and valid instrument
 - Symptom of MI
 - Health history
 - Risk factors
 - Annual income was adjusted to the Australian context based on ABS 2011 census data
 - An additional question: Are you familiar with any advertising campaigns related to MI and, if so, how did the campaign influence your decision to go to hospital?



Statistical analyses

- Continuous data were described with means, SD, medians & IQR
- Discrete data as frequencies & percentages
- Patient responses to familiarity with mass media campaigns and if the campaign influenced their decision to go to hospital
 - Analysed using content analysis
 - To enhance credibility and auditability data was categorized independently by two members of the research team. Disagreement were resolved with discussion until consensus was reached.
- Prehospital delay time
 - Subtracted ED arrival time from self-reported symptom onset time
 - Times were log-transformed
 - Multivariable linear regression



Results

Confirmed diagnosis of MI (n=367)

July 2013 to January 2014

- Excluded (n=9)
- Not first admission



Eligible participants approached (n=358)

Excluded (n=101)

- Unable to consent (n=43)
- Refused (n=38)
- Unable to contact (n=17)
- Died (n=3)



Participants recruited (n=257)

Excluded (n=2)

- Loss of telephone recorded consent
- Male (n=180)
- Female (n=75)



Results

- Arrived to hospital by ambulance (n=111, 44%)

Prehospital delay		
Median (IQR)	3.8 hrs (1.8 – 12.2)	
Mean (SD)	18.8 hrs (40.7)	
	n	(%)
< 1 hour	10	(3.9)
1-2 hours	37	(14.5)
>2-6 hours	58	(22.7)
>6-24 hours	39	(15.3)
>1-3 days	17	(6.7)
>3-7 days	9	(3.5)
>1 week	6	(2.4)
Missing	79	(31.0)



Results

Are you familiar with media campaigns and if so how did they influence your decision to go to hospital?	n (%)	Prehospital delay (hrs) Median (IQR)	Univariable linear regression		
			Exp (B)	95% CI	p-value
Aware, they influenced the decision to go to hospital	16 (6.3)	2.2 (2.0-9.8)	0.91	0.40-2.04	0.81
Aware, had no influence, however, had past experience influenced decision	16 (6.3)	2.9 (1.3-4.2)	0.58	0.26-1.31	0.19
Aware, they slightly influenced the decision	15 (5.9)	10 (1.1-27)	1.55	0.67-3.56	0.30
Aware, they had no influence on decision, as symptoms experienced were different	13 (5.1)	5.7 (3.0-10.5)	1.42	0.59-3.42	0.44
Aware, they had no influence on the decision	63 (24.8)	4.9 (1.7-18.5)	1.15	0.67-1.95	0.62
Unaware of media campaign about heart attack	52 (20.4)	3.9 (1.8-11.6)	1		

Results

Variable		n (%)	Prehospital delay (hrs) Median (IQR)	Multivariable linear regression		
				Exp (B)	95% CI	p-value
Marital status						0.007
	Never married	13 (5.1)	2.6(1.6-4.3)	0.82	0.38-1.73	0.68
	Widowed	19 (7.4)	10 (3.3-12.5)	3.53	1.82-6.88	<0.001
	Divorced	21 (8.2)	2.5 (1.9-7.2)	1.08	0.58-2.02	0.81
	Separated	10 (3.9)	5.3 (3.7-24)	1.61	0.71-3.66	0.26
	Defacto	8 (3.1)	6.2 (2.5-12)	0.92	0.37-2.32	0.87
	Married	104 (41)	3.5 (1.6-12)	1		
Symptom onset	Weekday	124 (71)	4.4 (1.9-15)	1.63	1.09-2.44	0.02
	Weekend	51 (29)	2.8 (1.3-5.9)			
Combined previous MI and CABG						0.001
	Neither previous MI or CABG	137 (78)	3.9 (1.9-12)	2.83	1.51-5.31	0.001
	Both previous MI and CABG	15 (9)	4.1 (2-27)	4.64	1.99-11	<0.001
	Previous MI only	22 (13)	2.8 (1.3-8)	1		

Results

Variable		n (%)	Prehospital delay (hrs) Median (IQR)	Multivariable linear regression		
				Exp (B)	95% CI	p-value
Mode of transport to hospital & ± transfer						<0.004
	RFDS → tertiary hospital	36 (21)	6.3 (1.4-16)	1.77	1.06-2.96	0.03
	Private → small metro hospital → transfer	22 (13)	5.1 (1.7-10)	1.45	0.77-2.73	0.25
	Ambulance → small metro hospital → transfer	18 (10)	2.3 (1.5-7.3)	1.01	0.52-1.96	0.98
	Private → tertiary hospital	37 (21)	8.4 (3.3-51)	4.14	2.44-7.03	<0.001
	Ambulance → tertiary hospital	61 (35)	2.9 (1.8-4.4)	1		
Sweating	Yes	88	2.8 (1.6-6.6)	0.46	0.31-0.68	<0.001
	No	87	6.4 (2.5-23)	1		
Weakness	Yes	79	3.6 (2.0-16)	1.58	1.06-2.34	0.02
	No	96	4.2 (1.8-12)	1		



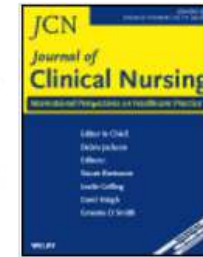
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Original Article

Myocardial infarction, patient decision delay and help-seeking behaviour: a thematic analysis

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Strengths and limitations

Strengths

- Interviewed all patients over a 7-month period
- Analyses adjusted for age, sex, comorbidity

Limitations

- Limited sample size
- Single hospital
- Familiarity with media campaigns
- Self-reported symptom onset time
- Health insurance status and reluctance to call an ambulance



Implications for future research

- Large sample sizes
- Target family members and friends and their awareness of media campaigns
- Investigate if reluctance to call ambulance is associated with the cost of ambulance



Conclusion

This study found in multivariable analysis that the variables associated with prehospital delay were:

- Marital status
- Symptom onset weekday or weekend
- Past medical history of MI and CABG
- Mode of transport to hospital
- Sweating
- Weakness

Patient awareness of media campaigns about heart attack was not associated with prehospital delay.



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Any Questions??



Thank you



Thank you

