Multicultural Presentation of Chest Pain to the Emergency Department (ED) at Liverpool Hospital

Riccardo Lee

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Co-Supervisor: Dr Tammy Wu
Aims

- To describe and analyse the cultural and ethnic differences in epidemiological characteristics and clinical outcomes of patients presenting to Liverpool ED with chest pain.
• That there would be differences in clinical outcomes between chest pain patients with and without a culturally and linguistically diverse background presenting to Liverpool ED.
Background

Australia Bureau of Statistics 2016 Census

• Population: 204,000 people
• 45% of residents born overseas
• 62.1% of residents have both parents born overseas

"Percentage of Liverpool (LGA) residents"

- Australia
- Iraq
- Vietnam
- Lebanon
- India
- Fiji
- Other

Australia Bureau of Statistics 2016 Census
Background

Culturally and Linguistically Diverse (CALD)

- Born in an English-speaking country
- Did not request an interpreter
- Not an Indigenous Australian
- Speaks English at home

Non-CALD Individual

Australian Bureau of Statistics, 1999
CALD Health Risk

CALD patients are at a higher risk of developing acute and chronic disease...

- Cardiovascular disease
- Respiratory disease
- Renal disease
- Traumatic Injury
Project Importance in the ED

- Annual 7.6 million ED presentations
- Minimal epidemiology ED presentation data
- One of the first study in Australia
- Provides initial chest pain epidemiology data
- Improve ED resource allocation
Chest Pain

• Symptom representing many conditions
• Differentiated into cardiac, non-cardiac and unspecified causes
• Major cause of concern due to time-sensitiveness of diagnosis and treatment of several diseases associated with chest pain
Methods

Chest pain patient presents to ED

Demographic questions, time of arrival, triage, vital sign physiology, triage category, time to triage

Medication prescribed, diagnostic and imaging investigation utilisation and time from arrival, doctor seen time, discharge time, length of stay (if discharged)

Hospitalisation rate and disposition, interventions used (Angioplasty, Coronary Artery Bypass Grafting, etc)

Discharge time, length of stay, in-hospital & ED representation
Methods

Paper Data Sources
- ED and Hospital Medication Chart
- ED and Hospital Fluid Chart

Electronic Data Sources
- FirstNet®
  Demographic data, ED triage data, disposition, observations and physiology measurements, ED length of stay.
- Powerchart®
  Patient history, In-hospital diagnostic and imaging times and results, observations and physiology measurements, progress notes, procedures
ED & in-hospital clinical data (electronic & paper sources)

- Probabilistically linking – Deidentified data

Univariate analysis using descriptive & inferential statistics
**Demographics**

- **n=263 chest pain presentation (including 5 representations)**
- **155 CALD patients (60.7%) & 103 non-CALD patients (39.93%)**
- **80 (50.96%) CALD females & 54 (50.94%) non-CALD females.**
- **CALD patients (median 59 years old) were older than non-CALD patients (median 50 years old) (p<0.0001)**
- **CALD had high proportion of cardiac risk factors**
Results

Santos et al., 2013

• CALD – median time to see ED doctor = 72 (0–437) mins
• Non-CALD – median time to see ED doctor = 68 (0–392) mins
Results

- CALD patients had higher utilisation in diagnostic and imaging investigations than non-CALD patients
- CALD patients had investigations ordered significantly earlier than non-CALD patients
- Low request for ED interpreters (n=44)
- Communication barriers exists
Results

- CALD who had antiplatelet medication = 17 (4.34%) of 438 medication administrations
- Non-CALD who had antiplatelet medication = 11 (2.28%) of 438 medication administrations

Figure 4: Distribution and spread of administration time of anti-platelet medication from ED arrival (mins) of CALD and non-CALD ED chest pain patients (p<0.0001)
Results

- CALD - median time to antiplatelet medication = 40 (7–459) mins
- Non-CALD - median time to antiplatelet medication = 159 (26-341) mins

Figure 4: Distribution and spread of administration time of anti-platelet medication from ED arrival (mins) of CALD and non-CALD ED chest pain patients (p<0.0001)
Results

- CALD – median ED length of stay = 280 (56 - 5231) mins
- Non-CALD - median ED length of stay = 259.5 (50-1494) mins

Figure 1: Distribution and spread of ED LOS of CALD and non-CALD ED chest pain patients (p<0.0001)
• CALD who had opioid analgesia
  = 31 (7.08%) of 438 administrations

• Non-CALD who had opioid analgesia = 23 (5.25%) of 438 administrations

Figure 3: Distribution and spread of administration time of opioid analgesia from ED arrival (mins) of CALD and non-CALD ED chest pain patients (p<0.0001).
• CALD - median time to opioid analgesia = 140 (13-592) mins
• Non-CALD – median time to opioid analgesia = 126.5 (23-510) mins

Figure 3: Distribution and spread of administration time of opioid analgesia from ED arrival (mins) of CALD and non-CALD ED chest pain patients (p<0.0001).
• Incomplete & incorrect data sources
• Resource and time constraints
• Confounder & bias effects
• Temporality
• Causality
Conclusion

• Many differences between CALD and non-CALD patients’ ED presentation

• CALD patients more likely to be recipients of diagnostic and imaging investigations and medications

• CALD patients’ investigations were processed faster than Non-CALD patients.
Future

- Expanding to entire South West Sydney Local Health District (6 hospitals)
- Including chest pain, sepsis, stroke and major trauma with more in-depth data variables
- Continuing to refine our CALD definition
- Electronic data collection and linkage
- Mapping data variables
Multicultural Presentation of Chest Pain to the Emergency Department (ED) at Liverpool Hospital

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Figure 4: Distribution and spread of the age of CALD and Non-CALD ED Chest Pain patients. Median age of non-CALD patients=48 (2-93), median age of CALD patients=57 (13-94).
Figure 5: Interpreter languages requested by CALD patients (n=44) when presenting to Liverpool ED with chest pain.
Figure 6: Distribution and spread of systolic blood pressure (SBP) of CALD and non-CALD patients at ED triage. Normal range for systolic blood pressure = 90-120mmHg. Median CALD systolic blood pressure = 135 (80-217) mmHg, median non-CALD systolic blood pressure = 140 (99-190) mmHg, p<0.0001.
Figure 7: Distribution and spread of diastolic blood pressure (DBP) of CALD and non-CALD patients at ED triage. Normal range for diastolic blood pressure = 60-80mmHg. Median CALD diastolic blood pressure = 80 (38-122) mmHg, median non-CALD systolic blood pressure = 78.5 (32-110) mmHg, p<0.0001.
Figure 8: Distribution and spread of body temperature of CALD and non-CALD patients at ED triage. Normal range for body temperature= 36-37°C. Median CALD body temperature = 36.8 (34.4-37.9) °C, median non-CALD body temperature = 36.7 (35.6-38.2) °C mmHg, p<0.0001.
Figure 9: Distribution and spread of respiratory rate of CALD and non-CALD patients at ED triage. Normal range for respiratory rate = 12-20 breaths per minute. Median CALD respiratory rate = 18 (12-48) breaths/min, median non-CALD respiratory rate = 18 (16-30) breaths/min, p<0.0001.
Figure 10: Distribution and spread of heart rate of CALD and non-CALD patients at ED triage. Normal range for heart rate = 60-100 beats per minute. Median CALD heart rate = 85 (44-176) beats/min, median non-CALD heart rate = 81.5 (31-144) breaths/min, p<0.0001.
Appendix

Figure 11: Distribution and spread of oxygen saturation of CALD and non-CALD patients at ED triage. Normal range for oxygen saturation= 95-100%. Median CALD oxygen saturation = 98 (88-100) %, median non-CALD oxygen saturation = 98 (92-100) %, p<0.0001.
Figure 12: Distribution and spread of blood chemistry order time from ED arrival (mins) of CALD and non-CALD ED CP patients. CALD median=136 [11-561] mins, Non-CALD median= 217 [17-467] mins, p<0.0001.
Figure 13: Distribution and spread of haematology order time from ED arrival (mins) of CALD and non-CALD ED CP patients. CALD median=121.5 [11-686] mins, Non-CALD median=39 [17-343] mins, p<0.0001.
Figure 12: Distribution and spread of ECG order time from ED arrival (mins) of CALD and non-CALD ED CP patients. CALD median=33.5 [0-642] mins, non-CALD median=40.5 [9-303] mins, p<0.0001.
Figure 13: Distribution and spread of chest x-ray order time from ED arrival (mins) of CALD and non-CALD ED CP patients. CALD median=82.5 [5-1289] mins, Non-CALD median= 91.5 [18-1526] mins, p<0.0001.
<table>
<thead>
<tr>
<th>Language Spoken at Home</th>
<th>Proportion</th>
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<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>183 (70.3%)</td>
<td>Assyrian</td>
<td>2 (0.78%)</td>
</tr>
<tr>
<td>Arabic</td>
<td>19 (7.36%)</td>
<td>Greek</td>
<td>2 (0.78%)</td>
</tr>
<tr>
<td>Italian</td>
<td>7 (2.71%)</td>
<td>Hmong</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>7 (2.71%)</td>
<td>Laotian</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Cantonese</td>
<td>4 (1.55%)</td>
<td>Lebanese</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Hindi</td>
<td>4 (1.55%)</td>
<td>Macedonian</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Khmer-Cambodian</td>
<td>4 (1.55%)</td>
<td>Other Language</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Serbian</td>
<td>4 (1.55%)</td>
<td>Romanian</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Spanish</td>
<td>4 (1.55%)</td>
<td>Russian</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Croatian</td>
<td>3 (1.16%)</td>
<td>Tagalog</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Persian (excluding Dari)</td>
<td>3 (1.16%)</td>
<td>Thai</td>
<td>1 (0.39%)</td>
</tr>
<tr>
<td>Arabana</td>
<td>2 (0.78%)</td>
<td>Turkish</td>
<td>1 (0.39%)</td>
</tr>
</tbody>
</table>
Appendix

Indigenous Australians

- n=7 (2.71%)
- 4 males and 3 females
Table 2: Top 15 countries of birth of CALD and non-CALD patients in the study period.

<table>
<thead>
<tr>
<th>Country</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>98 (37.98%)</td>
</tr>
<tr>
<td>Fiji</td>
<td>17 (6.59%)</td>
</tr>
<tr>
<td>Lebanon</td>
<td>13 (5.04%)</td>
</tr>
<tr>
<td>Vietnam</td>
<td>12 (4.65%)</td>
</tr>
<tr>
<td>Iraq</td>
<td>11 (4.26%)</td>
</tr>
<tr>
<td>Italy</td>
<td>11 (4.26%)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>9 (3.49%)</td>
</tr>
<tr>
<td>Croatia</td>
<td>5 (1.94%)</td>
</tr>
<tr>
<td>India</td>
<td>5 (1.94%)</td>
</tr>
<tr>
<td>Philippines</td>
<td>5 (1.94%)</td>
</tr>
<tr>
<td>Cambodia</td>
<td>4 (1.55%)</td>
</tr>
<tr>
<td>China (exc)</td>
<td>4 (1.55%)</td>
</tr>
<tr>
<td>Greece</td>
<td>4 (1.55%)</td>
</tr>
<tr>
<td>Serbia</td>
<td>4 (1.55%)</td>
</tr>
<tr>
<td>Iran</td>
<td>3 (1.16%)</td>
</tr>
</tbody>
</table>
Figure 14: Proportion of CALD and non-CALD chest pain patients for each Australian Triage Scale category when presenting to Liverpool ED.