Is it safe to discharge patients 24 hours after uncomplicated successful primary percutaneous coronary intervention

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Disclosure

I do not have any potential conflict of interest
Primary percutaneous coronary intervention (PPCI) is the gold standard for the treatment of ST-segment elevation myocardial infarction (STEMI) when the procedure is performed expeditiously.

The length of hospital stay after successful PPCI (determined by a diameter stenosis <30% and a TIMI 3 flow) is a subject of debate.

Current European and American Guidelines both recommend early discharge (defined as within 4 days of admission) in selected patients with uncomplicated acute MI.
Background

• In the thrombolytic era it has been shown to safely discharge low-risk patients within 3 to 4 days

• PPCI-treated patients have reduced MACE compared to thrombolysis including in hospital events

• PAMI-II / Safe-Depart - post PPCI (3 days) safe and cost-effective to discharge low-risk patients after uncomplicated PPCI

• Data from our institution (Jones et al EuroPCR 2011, BCS 2011) show that 2 day stay of safe and feasible
Aim

• We sought to determine whether in very low risk PPCI patients ultra-short hospital stays (24 h) might be safe and feasible
Method

- Prospective observational study of unselected STEMI patients
- PPCI at a single high volume regional heart attack centre in London
  - January 2004-July 2011
- All patients were reviewed at 1, 8 and 52 weeks following angioplasty with a multidisciplinary team including rehabilitation, heart failure, and psychologist
- MACE assessed at median 2.8 years (range: 1.3-4.4) included clinics
  - Death
  - Myocardial Infarction (MI)
  - Target vessel revascularisation (TVR)
  - Stroke
- All cause mortality data was obtained from the Office of National Statistics (UK) via the Central Cardiac Audit Database (CCAD)
Criteria for early discharge

• Discharge at \( \leq \) 48 hour could be considered for patients meeting all the following criteria:
  – TIMI III flow in the infarct related artery
  – LVEF \( \geq 40\% \)
  – Freedom from arrhythmia 24 hours post PCI
  – No clinical signs of heart failure
  – Absence of co-existent severe co-morbidity

• Patient discharge remained at discretion of operating physician
Method

• Standard PPCI protocol for our institution includes pre-loading with
  – 300mg aspirin
  – 300mg or 600mg clopidogrel
  – Bolus of GP IIb/IIIa inhibitor unless contraindicated
  – Aspiration thrombectomy was performed at the operator’s discretion

• Successful primary PCI result was defined as final TIMI (Thrombolysis In Myocardial Infarction) flow grade 3 and residual stenosis <20% in the infarct-related artery at the end of the procedure
2,980 patients
- 1,806 patients not suitable for 48 hour discharged
- 964 patients discharged at 48 hours
- 150 delayed for non-clinical reasons
- 210 patients discharged after longer than 48 hours
- 60 due to a clinical complication
  - 53 complications within 24 hours
  - 7 complications between 24 and 48 hours
## Demographics

<table>
<thead>
<tr>
<th></th>
<th>48 hour stay (n=965)</th>
<th>72 hour stay (n = 534 )</th>
<th>&gt;72 hour stay (n = 852)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (female)</td>
<td>192 (19.9%)</td>
<td>125 (23.4%)</td>
<td>247 (29.0%)</td>
<td>P&lt;0.0001 *</td>
</tr>
<tr>
<td>Age (yrs)</td>
<td>61.02 ± 0.13</td>
<td>63.21 ± 0.27</td>
<td>67.33 ± 0.27</td>
<td>P&lt;0.0001 *</td>
</tr>
<tr>
<td>Hypertension</td>
<td>434 (45.0%)</td>
<td>240 (45.0%)</td>
<td>415 (48.7%)</td>
<td>0.351</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>147 (15.2%)</td>
<td>93 (17.5%)</td>
<td>177 (20.8%)</td>
<td>0.008 *</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>415 (43.0%)</td>
<td>247 (46.3%)</td>
<td>394 (46.3%)</td>
<td>0.371</td>
</tr>
<tr>
<td>Active smoker</td>
<td>102 (10.6%)</td>
<td>67 (12.5%)</td>
<td>107 (12.5%)</td>
<td>0.412</td>
</tr>
<tr>
<td>Previous MI</td>
<td>104 (10.8%)</td>
<td>64 (12.0%)</td>
<td>139 (16.3%)</td>
<td>0.002 *</td>
</tr>
<tr>
<td>Previous CABG</td>
<td>15 (1.6%)</td>
<td>11 (2.1%)</td>
<td>74 (8.7%)</td>
<td>P&lt;0.0001 *</td>
</tr>
<tr>
<td>Previous PCI</td>
<td>87 (9.0%)</td>
<td>60 (11.3%)</td>
<td>101 (11.9%)</td>
<td>0.133</td>
</tr>
<tr>
<td>Cardiogenic Shock</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>80 (9.4%)</td>
<td></td>
</tr>
<tr>
<td>LVEF</td>
<td>48.43 ± 6.3</td>
<td>45.24 ± 6.2</td>
<td>37.13 ± 14.2</td>
<td>P&lt;0.0001 *</td>
</tr>
<tr>
<td>CRF (eGFR&lt;60)</td>
<td>78.58 ± 24.4</td>
<td>75.05 ± 18.9</td>
<td>66.21 ± 20.8</td>
<td>P&lt;0.0001 *</td>
</tr>
<tr>
<td>Peak Troponin (Mean)</td>
<td>2.823 ± 6.5</td>
<td>4.287 ± 9.0</td>
<td>4.575 ± 8.9</td>
<td>0.0004 *</td>
</tr>
</tbody>
</table>

Values expressed as mean +/- SD or number (%).
MACE data

• 60 (5.1%) patients fitting criteria had their planned 48-hour discharge delayed due to a clinical complication
• 53 occurred within the first 24 hours (including 6 MACE events and 7 arrhythmias, there were no deaths)
• Only 7 patients (0.60%) developed complications after 24 hours; of which only 1 (0.09%) suffered a MACE event (target vessel revascularisation)
• The remaining complications being abnormal blood tests (renal/liver function) or drug reactions (e.g. rash).
• There were no in-hospital deaths in the 48 hour group.
# Demographic Data

<table>
<thead>
<tr>
<th>Reason</th>
<th>1st 24 hours</th>
<th>After 24 hours</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACE</td>
<td>5 (0.42%)</td>
<td>1 (0.09%)</td>
<td>6 (0.51%)</td>
</tr>
<tr>
<td>Thrombocytopenia/bleeding</td>
<td>15 (1.28%)</td>
<td>0 (0%)</td>
<td>15 (1.28%)</td>
</tr>
<tr>
<td>Haematoma</td>
<td>2 (0.17%)</td>
<td>0 (0%)</td>
<td>2 (0.17%)</td>
</tr>
<tr>
<td>Renal/liver dysfunction</td>
<td>2 (0.17%)</td>
<td>4 (0.36%)</td>
<td>6 (0.51%)</td>
</tr>
<tr>
<td>Infectious and lung diseases</td>
<td>7 (0.60%)</td>
<td>0 (0%)</td>
<td>7 (0.60%)</td>
</tr>
<tr>
<td>Further chest pain/STE (non-MACE)</td>
<td>5 (0.42%)</td>
<td>0 (0%)</td>
<td>5 (0.43%)</td>
</tr>
<tr>
<td>Arrhythmia</td>
<td>6 (0.51%)</td>
<td>1 (0.09%)</td>
<td>7 (0.60%)</td>
</tr>
<tr>
<td>CCF/Pulmonary oedema</td>
<td>2 (0.17%)</td>
<td>0 (0%)</td>
<td>2 (0.17%)</td>
</tr>
<tr>
<td>Other</td>
<td>9 (0.76%)</td>
<td>1 (0.09%)</td>
<td>10 (0.85%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>53 (4.50%)</td>
<td>7 (0.60%)</td>
<td>60 (5.10%)</td>
</tr>
</tbody>
</table>

**Table1.** Clinical complications in the cohort planned for 48 hour discharge
Could Patients be d/c at 24 hours

• Safe at 48 hours
• Few events occur after first 24 hours

• ? Education
• ? Re-presentation
Re-presentation/Education

• Re-admission rates for non-MACE events (including heart failure, troponin negative chest pain syndromes and chest infections) in the first 30 days were 4.8%, 4.9% and 4.6% for patients discharged 2 days, 3 days and >3 days after admission

• No difference in % secondary prevention prescriptions but lower mean ACEi dose
Conclusions

• Simple clinical criteria can be used to identify low-risk patients suitable for very early discharge 48 hours following uncomplicated successful primary PPCI.
• With only a small percentage of complications occurring after the first 24 hours, discharge after 24 hours may be safe and warrants further study.
Thank You

Any Questions?