A Prospective Evaluation of the Utility of the Prehospital 12-Lead Electrocardiogram to Change the Management of Patients in the Emergency Department

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CAEP
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Background

Provincial Directive for pECG Acquisition

• An alert patient experiencing chest pain or other symptoms consistent with that caused by cardiac ischemia

• Experiencing typical angina/MI pain

• 3 or 5 lead ECG shows a rhythm which is difficult to interpret
Background

• Valuable information can be captured with an ECG prior to any prehospital treatments

• By the time patients are assessed by an ED physician, symptoms may have resolved

• Initial ED ECG may be normal
The Utility of the Prehospital ECG in the Emergency Department


• Of the 63 prehospital ECGs reviewed, 16 (25.4%) showed changes not present on the initial ED ECG
The Utility of the Prehospital ECG in the Emergency Department


- 12 (19%) had differences sufficient enough to potentially influence ED management
- Need for prospective study
Retrospective Review

• 1/110 had the pECG included in the ED record

• 62/110 had the pECG included in the ACR

• 0/110 MDs documented that the pECG was available and or reviewed
The NEED for a pECG Handover Process
Steps to Get There

- Working group established
  - Physicians
  - RN/ED Managers
  - Paramedic Manager

- Development of pECG handover process
pECG completed

Paramedic gives pECG to RN accepting care

RN/clerk stamps pECG with patient's address

RN/clerk staples pECG to 2nd page of RN record
Education Campaign

- Posters in ED
- Emails
  - Paramedics
  - Nurses
  - Physicians
- Word of Mouth
- Adaptation of Physician and RN charts
A prospective evaluation of the utility of the prehospital 12-lead electrocardiogram to change the management of patients in the emergency department
Objectives

To prospectively determine:

• How many pECGs had clinically significant abnormalities not present on the initial ED ECG

• How many pECGs changed physician management
Methods

• Prospective cohort study of patients
• ≥ 18 years
• pECG completed by EMS prior to arriving at one of two tertiary care EDs
• Assessed by a physician in the ED
Exclusion Criteria

- STEMI bypass
- VSA upon EMS arrival
- Questionnaire not completed
Paramedic picks up data collection form

Data collection form handed over with pECG and attached to chart by RN

Physician completes 9 question data collection form

R.A. retrospectively collected secondary data points
Methods

• Physicians reviewed the pECG to determine if any clinically significant abnormalities were present that were not captured by the initial ED ECG
Methods

• Physicians also recorded IF and HOW the pECG changed their ED management
Results

• 168 patients included between February 21, 2011 and April 11, 2011

• 76% of all eligible patients identified

• 64% of all eligible patients had questionnaire completed
Demographics

• 57% male

• Mean (SD) age = 66.1 (18.1) years
Results

• 21 (12.5%) of pECGs showed changes that were not captured on the initial ED ECG
Abnormalities not present on ED ECG

Clinically Significant Abnormality

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of events</th>
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<tbody>
<tr>
<td>STD</td>
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<tr>
<td>TWI</td>
<td>3</td>
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<td>STD and TWI</td>
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<tr>
<td>Arrhythmia</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
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</tbody>
</table>
Results

- 25 (14.9%) changed physician management

13 had abnormalities not captured on ED ECG

12 had abnormalities that were also captured on ED ECG
How the pECG Changed Management

- 13 (7.7%) with abnormalities not captured on ED ECG
  - 7 consulted inpatient service
  - 2 laboratory investigations
  - 1 immediate treatment
  - 1 outpatient testing
  - 2 outpatient referral
How the pECG Changed Management

- 12 (7.1%) pECGs that were not different from the initial ED ECG
  - 2 Code STEMI initiated
  - 3 no need for formal ED ECG
  - 4 immediate treatment
  - 1 laboratory investigation
  - 2 unknown
Results

• In 14 (8.3%) instances, MDs were willing to refer the patient to an inpatient service based on information captured on the pECG, regardless if the initial ED ECG was normal
Limitations

- 64% of eligible patients included
- Something unique about those excluded?
Limitations

• Clarity of question, “With this patient’s pECG, would you be willing to refer the patient to an inpatient service regardless if the initial ED ECG is normal”

• Authors, research committee members reviewed all questions
Conclusions

- pECG have clinically significant abnormalities that are not always captured on the initial ED ECG
- pECG can change/influence patient management in the ED
Conclusions

• More effective pECG handover process
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