DECREASING TIME TO DIAGNOSIS IN PATIENTS WITH ACUTE CHEST PAIN

The incremental cost-effectiveness of implementing a multiple biomarker assay for early exclusion of NSTEMI

Kip MMA1, Steuten LMG1, Kusters GCM1,2
University of Twente, HTSR1, Drienerlolaan 5, 7522 NB Enschede, The Netherlands
Jeroen Bosch Ziekenhuis2, Henri Dunantstraat 1, 5223 GZ ’s Hertogenbosch, The Netherlands
Email: m.m.a.kip@utwente.nl

Examine the incremental cost-effectiveness of a multimarker assay, compared to the current high-sensitive troponin assay, in excluding NSTEMI in patients with acute chest pain.

METHODS

- **Multimarker**: combined measurement of myeloperoxidase, copeptin, and high-sensitive troponin.
- **Questionnaire** among 10 cardiologists.
  - **Focus**: influence of multimarker on patient’s discharge and diagnostic activities performed.

Evaluation of:

- A range of sensitivities and negative predictive values (NPVs) of the multimarker.
  - Based on literature analysis.
- Three implementation strategies:
  1. Multimarker assay at the time of a patient’s entrance at the hospital (t0).
  2. Multimarker plus one troponin measurement after two hours (t2).
  3. Multimarker plus troponin measurements after two and six hours (t2 and t6).

- Increased analytical performance by multimarker4.
- Therefore, we recommend implementation of the multimarker with troponin assays at t2 and t6.

- Early economic evaluation, therefore:
  - Relatively much uncertainty in input variables.
  - Interpret results cautiously.

RESULTS

- **Expected patients discharge**
  - t0: 0%, t2: 20%, t6: 40%
  - **Troponin**: sens. 85%, NPV 95%
  - **Multimarker**:
    - sens. 90%, NPV 96%
    - sens. 95%, NPV 98%
    - sens. 99%, NPV 99%

- **Expected activities performed**
  - Exercise: 0%, ECG: 20%, Catheterization: 40%
  - **Cost-effectiveness plane**
    - Incremental costs: -€200 to €400
    - Incremental discharges: 0 to 250
    - **Strategy**
      - Sens. (%) NPV (%) I II III
      - 90 96
      - 95 98
      - 99 99

- **Consequences**:
  - Earlier patient discharge
  - Possible cost savings3.

DISCUSSION

- Further research is necessary.
  - Specify patients in categories (low, intermediate and high risk of myocardial infarction).
  - Development should focus on point-of-care tests.

CONCLUSION

- Increased analytical performance by multimarker4.
- Therefore, we recommend implementation of the multimarker with troponin assays at t2 and t6.

LITERATURE