Natriuretic Peptide Testing for Cardiac Amyloidosis: Clinical Effectiveness, Cost-Effectiveness and Guidelines
Authors: Deba Hafizi, Suzanne McCormack


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Research Questions

1. What is the clinical utility of natriuretic peptide testing for diagnosis and prognosis of light chain cardiac amyloidosis?
2. What is the cost-effectiveness of natriuretic peptide testing for diagnosis and prognosis of light chain cardiac amyloidosis?
3. What are the evidence-based guidelines for natriuretic peptide testing for monitoring of light chain cardiac amyloidosis?

Key Findings

Three non-randomized studies were identified regarding the clinical utility of natriuretic peptide testing for diagnosis and prognosis of light chain cardiac amyloidosis. In addition, two evidence-based guidelines were identified regarding natriuretic peptide testing for monitoring of light chain cardiac amyloidosis. No economic evaluations were identified regarding the cost-effectiveness of natriuretic peptide testing for diagnosis and prognosis of light chain cardiac amyloidosis.

Methods

A limited literature search was conducted by an information specialist on key resources including PubMed, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused Internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. The main search concepts were natriuretic peptides and amyloidosis. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between Jan 1, 2014 and Jul 31, 2019. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

<table>
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<th>Population</th>
<th>Patients of all ages with cardiac amyloidosis</th>
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<td>Intervention</td>
<td>Natriuretic peptide testing (B-type natriuretic peptide [BNP] or N-terminal pro b-type natriuretic peptide [NT-proBNP] blood tests) with/without additional diagnostic test(s)</td>
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| Comparator                  | Q1-2: No natriuretic peptide testing; other prognostic testing (cardiac troponin T test and echocardiography)  
Q3: Not applicable         |
| Outcomes                    | Q1: Clinical utility (e.g., changes to therapy)  
Q2: Cost-effectiveness  
Q3: Guidelines               |
| Study Designs               | Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines |
Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

Three non-randomized studies\textsuperscript{1-3} were identified regarding the clinical utility of natriuretic peptide testing for diagnosis and prognosis of light chain cardiac amyloidosis. In addition, two evidence-based guidelines\textsuperscript{4-5} were identified regarding natriuretic peptide testing for monitoring of light chain cardiac amyloidosis. No relevant health technology assessments, systematic reviews, randomized controlled trials or economic evaluations were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Three non-randomized studies\textsuperscript{1-3} were identified regarding the clinical utility of natriuretic peptide testing for diagnosis and prognosis of light chain cardiac amyloidosis. The authors of the first study\textsuperscript{1} found that assessing natriuretic peptides (B-type natriuretic peptide [BNP] or N-terminal pro b-type natriuretic peptide [NT-proBNP]) in patients with cardiac amyloidosis does not accurately estimate left ventricular filling pressure, which may be used in treatment planning for patients with cardiac amyloidosis.\textsuperscript{1} Authors of the second non-randomized study\textsuperscript{2} examined the accuracy of cardiac biomarkers such as NT-proBNP in the differential diagnosis of light chain cardiac amyloidosis. The authors found that both NT-proBNP and high sensitive troponin T were potential biomarkers for differentiating cardiac amyloidosis from Freidrich’s ataxia and Fabry disease.\textsuperscript{2} The authors of the third study\textsuperscript{3} found that a decrease in BNP to 200 pg/mL or less was associated with longer survival in patients with light chain cardiac amyloidosis.

Guidelines from the British Society of Haematology recommends that cardiac biomarkers, such as NT-proBNP, troponin T, and serum FLC assessments be used in prognostic scoring in patients with light chain cardiac amyloidosis, and states that these biomarkers can be used to identify patients in high risk groups.\textsuperscript{4} Another guideline from the British Society of Haematology recommends that NT-proBNP be tested every 3 to 6 months to monitor the effect of chemotherapy on organ function in patients with light chain cardiac amyloidosis.\textsuperscript{5}

References Summarized

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.

Randomized Controlled Trials

No literature identified.
Non-Randomized Studies


Economic Evaluations

No literature identified.

Guidelines and Recommendations


See: Prognostic factors and staging systems, Recommendations


See: Monitoring treatment, Organ function (recommended every 3-6 months)
Appendix — Further Information

Non-Randomized Studies

Alternative Outcome

   PubMed: PM26765991

Prediction models

   PubMed: PM31189919

   PubMed: PM29111123

Review Articles

    PubMed: PM31257205

    PubMed: PM27527836

    PubMed: PM27900617