Role of Natriuretic Peptides in Diagnosing Heart Failure

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Summary and Conclusions

TECHNOLOGY AND TARGET GROUP Approximately 200 000 people in Sweden have symptomatic heart failure. In addition, about equally as many have asymptomatic, impaired cardiac function. Around 30 000 new cases appear annually. Common symptoms of heart failure are shortness of breath, fatigue, and swollen legs. These symptoms alone, however, are not sufficient to confirm the diagnosis of heart failure. Establishing a diagnosis of heart failure also requires confirmation of impaired cardiac function, usually through echocardiography (ultrasound examination of the heart). This is a labor-intensive and relatively expensive diagnostic procedure. Measuring the concentration of B-type natriuretic peptides (BNP and N-terminal proBNP) in the blood is intended to help better determine if the symptoms are caused by heart failure, or other conditions. These peptides are produced at a higher rate as the load increases on the ventricular muscles of the heart. BNP and N-terminal proBNP can be analyzed by so-called point-of-care methods that yield results within about 15 minutes. A rapid test result benefits the physician and patient alike, assuming that diagnostic quality is satisfactory.

PRIMARY QUESTION Does determining the concentration of B-type natriuretic peptides (BNP and N-terminal proBNP) in the blood facilitate and improve diagnostics in heart failure?

PATIENT BENEFIT Several studies have shown that natriuretic peptide testing has a high negative predictive value, which means that one can rule out with considerable certainty that a patient has heart failure. This knowledge can help accelerate the diagnosis of other possible disorders. However, the positive predictive value of the test is not equally as high. Hence, it is necessary to complement the test with an assessment of cardiac function to determine, usually through echocardiography, whether or not the patient has heart failure. Further research is required to determine the optimum decision cut-points for use in clinical practice.

ECONOMIC ASPECTS The cost of taking a sample and analyzing BNP or N-terminal proBNP is approximately 200 to 350 Swedish kronor (SEK). By comparison, the cost for echocardiography is 1500 to 2500 SEK. Since analysis of natriuretic peptides can identify patients with a low probability for heart failure, further examination by echocardiography in this patient group could be avoided.

SBU's appraisal of the evidence

Moderately strong scientific evidence (Evidence grade 2)* shows that BNP or N-terminal proBNP can be used, with good reliability, to rule out heart failure. However, evidence remains insufficient* concerning the cost effectiveness of the method relative to other methods of diagnosing heart failure.

** Criteria for Evidence Grading SBU's Conclusions*

Evidence Grade 1 – Strong Scientific Evidence. The conclusion is corroborated by at least two independent studies with high quality and internal validity, or a good systematic overview.

Evidence Grade 2 – Moderately Strong Scientific Evidence. The conclusion is corroborated by one study with high quality and internal validity, and at least two studies with medium quality and internal validity.

Evidence Grade 3 – Limited Scientific Evidence. The conclusion is corroborated by at least two studies with medium quality and internal validity.

Insufficient Scientific Evidence. No conclusions can be drawn when there are not any studies that meet the criteria for quality and internal validity.

Contradictory Scientific Evidence. No conclusions can be drawn when there are studies with the same quality and internal validity whose findings contradict each other.

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