

EP20.08

Diagnosing heart failure with NT-proBNP in general practice: Lower costs and higher precision

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Background & Aim: Afflicting 1-2% of the adult population, heart failure is a serious condition with considerable morbidity and mortality. While echocardiography may be considered the gold standard diagnostic test, GPs have relied on symptoms and clinical findings. Increasingly, quantification of serum natriuretic peptides (BNP/NT-proBNP) is recommended as a more precise test. The aim of this study was to estimate one year health outcome and costs of three diagnostic strategies: History and clinical findings (“clinical diagnosis”); clinical diagnosis supplemented with NT-proBNP point-of-care test in the GP’s surgery (“POC-test”) or in hospital laboratory (“hospital-test”).

Method: We developed a decision tree model to simulate one year patient courses with each of the strategies. Sensitivity and specificity of clinical diagnosis (56% and 68%) and of NT-proBNP test (90% and 65%) were based on published literature. The probabilities of referral to hospital given a test outcome were based on a survey of Norwegian GPs (n=103). The costs were based on various Norwegian fee schedules.

Results: The one-year societal costs were NOK4,897, NOK 4,544 and NOK5,467 for clinical diagnosis, PC-test and hospital test, respectively (€1.00≈NOK9.00). Even though POC-testing entails higher laboratory costs than the other test modalities, the total primary care costs are lower with such testing because of fewer re-consultations with the GP and less use of spirometry. POC-testing also entails lower hospital costs because of fewer false positive heart failure tests. Finally, patients’ travel costs are lower with POC-test because of fewer re-consultations and fewer unnecessary referrals to hospital. While 38% of patients had a delayed correct diagnosis with clinical diagnosis, the proportions were 22% with PC-test and hospital-test.

Conclusions: Clinical diagnosis in combination with NT-proBNP-tests has higher sensitivity and specificity than clinical diagnosis alone and is consequently more accurate. POC-testing results in earlier diagnosis and lower costs than the other diagnosis modalities.