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Rapid Evidence Synthesis: SomaScan

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Rapid Evidence Synthesis:

Rapid Evidence Syntheses (RES) are produced by the National Institute for Health and Care Research (NIHR) Applied Research Collaboration Greater Manchester (ARC-GM). The methods used are based on a framework set out in Norman et al. 2022 and previously registered on the Open Science Framework (OSF).[a,b]

RES use evidence synthesis approaches and draw on the GRADE Evidence to Decision framework[3] to provide rapid assessments of the existing evidence and its relevance to specific decision problems. In the first instance they focus on evidence from guidance and existing evidence syntheses. They are undertaken in a real-time context of decision-making around adoption of innovative health technologies and are designed to provide a "good-enough" answer to inform decision problems in a short timescale. RES methods are flexible and adaptive. They have evolved in response to user feedback and differ depending on the nature of the assessment undertaken.

RES are not intended to serve as a substitute for a systematic review or rapid review of evidence.

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We welcome feedback and are particularly interested to hear how you have used this Rapid Evidence Synthesis.

Please send any queries or comments to:

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Additional information:

This work was undertaken by the National Institute for Health Research (NIHR) Applied Research Collaboration Greater Manchester (ARC-GM). The views expressed are those of the author and not necessarily those of the NIHR or the Department of Health and Social Care.

[a] Norman, G. Rapid evidence synthesis to support health system decision making. *OSF registration*. 2020 [cited 2023]; Available from: osf.io/hsxk5

[b] Norman, G., et al., Rapid Evidence Synthesis To Enable Innovation And Adoption in Health and Social Care. *Systematic Reviews,* 2022. 11: p. 250. https://doi.org/10.1186/s13643-022-02106-z

[3] Alonso-Coello, P., et al., GRADE Evidence to Decision (EtD) frameworks: a systematic and transparent approach to making well informed healthcare choices. 1: Introduction. *BMJ,* 2016. 353: p. i2016.

1. Summary

1.1 Prognostic value of SomaScan

There is preliminary evidence that SomaScan assays findings may correlate with prognosis in some groups of people with heart failure (HF). There is validated evidence from large prospective cohorts that SomaScan has predictive value for secondary events in people with coronary heart disease (CHD). This is indirectly relevant evidence for people with HF.

1.2 Interventions for people with heart failure

There is evidence in addition to the detailed recommendations of the NICE guideline that interventions for people with HF can be effective. These include case management and multidisciplinary interventions for disease management, advance care planning and exercise-based cardiac rehabilitation (and interventions to increase participation in this). This is low to moderate certainty evidence from Cochrane systematic reviews.

1.3 Impact of using SomaScan on outcomes

There is no evidence for the impact on outcomes in people with HF of applying SomaScan.

2. Methods

2.1 Search

Searches were carried out in early March 2020 (03/03 and 04/03 2020). Key terms included “heart failure”; “SomaScan”; and “proteomic”. Sources searched included the Cochrane Library, PubMed, the NICE website and the manufacturer’s website. [1]

2.2 Key Questions

Question 1. How accurate are SomaScan proteomic assay results for predicting outcomes in people with an existing diagnosis of heart failure (HF)? This should be considered in terms of the additional value of information from using SomaScan in addition to available data.

Question 2. How effective are interventions for people with HF in improving key outcomes? Testing should always be considered in the context of the consequences of particular test results.

Question 3. What impacts does SomaScan use have on key outcomes for patients? (What is the test-and-treat evidence as well as the prognostic evidence?)

Question 4. Is there any evidence for the use of SomaScan in other indications – either prognostic predictive value or test and treat impacts?

3. Results

3.1 Predictive (prognostic) value of SomaScan in heart failure (question 1)

The manufacturer's documentation describes validation against the NTproBNP test as being in development and having been presented at the AHA (American Heart Association Conference). NICE guidance [2] recommends the use of N-Terminal pro-B-type natriuretic peptide (NT-proBNP) in the diagnosis of HF, and in the decision making for referral to specialist assessment and ECG (thresholds for referral within 2 weeks and 6 weeks are 2,000 ng/L and 400 ng/L). It notes that the test does not distinguish between HF with reduced ejection fraction and HF with preserved ejection fraction (HFrEF or HFpEF). The comparison/validation against NTproBNP in both populations is appropriate.

The evidence referred to in the manufacturer's documentation appears to be published in two 2019 abstracts,[3,4] which present data from the Penn Heart Failure Study, a prospective cohort of over 1800 people with HF. These look at biomarker profiles and differential prognosis between people with HFrEF, HFpEF and HF-recovered (people in whom EF rose from >50% to < 50% between pre-and post-enrolment). The results presented appear to show that HF-recovered people have an abnormal biomarker profile at baseline. These are abstracts and it is not possible to assess the evidence presented further. A full paper presents results on a prospective cohort of 168 people (INCA study) with HFrEF and identifies six proteins as predicting poor prognosis (death within 3 years).[5] The population assessed was relatively young (mean age 59). These results appear to represent appropriate analyses but have not been validated. An abstract reports validation of a multiple protein model for improved prediction of death in prospective cohorts of people with HFrEF but there is insufficient detail to analyse further.[6]

The documentation also describes validation for major cardiovascular event prediction. This appears to be based on a 2016 study in two prospective cohorts of people with CHD.[7] A 9-protein risk score was validated in populations of people with CHD, being compared over four years to the Framingham risk score (Framingham secondary event risk model), which is an established risk assessment tool, and showed some increased performance compared to this. This is a different population to people with HF and is therefore indirectly relevant evidence.

3.2 Evidence for the effectiveness of interventions in people with heart failure (question 2)

Multiple Cochrane reviews assess the effectiveness of interventions for people with HF. They include each type of intervention identified as being helpful in the manufacturer's documentation (medication, medical devices, surgery and intensive lifestyle management). Many were incorporated into the 2018 NICE guideline.[2] Reviews published more recently are highlighted.

A 2019 Cochrane review assessed case management, clinic-based interventions and multidisciplinary interventions. It included 47 trials of disease management interventions in over 10,000 people with at least one hospital admission with a diagnosis of HF. There is low to moderate certainty evidence for case-management and multidisciplinary interventions improving outcomes including all-cause mortality and readmission to hospital with HF. The review included cost-effectiveness analyses for case management which provided low-certainty evidence for cost-effectiveness; a multidisciplinary intervention may be cost-effective from a societal perspective.[8]

A 2020 Cochrane review of advanced care planning in people with HF looked at concordance between people's preferences and end of life care, documentation of discussions about advance care

planning, quality of life and depression, as well as mortality.[9] Most evidence was very low certainty but advance care planning may improve documentation of discussion about processes for advance care planning and may improve depression in people with HF.

2019 Cochrane reviews on cardiac rehabilitation in HF found that cardiac rehabilitation, and interventions to increase participation in it, may be effective across a range of key outcomes. [10,11]

3.3 Evidence for the impact on heart failure outcomes of using SomaScan (question 3)

We were unable to identify any evidence on the impact of using Soma Scan on clinical outcomes. The importance of discussing prognosis with people and of using it to guide monitoring and further treatment referrals is contained in the NICE guidance.[2] There are multiple risk prediction models for death or hospitalisation in HF, a systematic review identified more than 60. [12]

3.4 Use of SomaScan to characterise other variables (question 4)

some text has been removed because it contains confidential information we do not have permission to publish

NICE guidance notes that: obesity, renal (kidney) dysfunction, diabetes and liver cirrhosis can all produce effects on serum natriuretic peptides, and hence can affect the results of the NTproBNP test.[2] Fitness and metabolism and behavioural drivers of risk are broad concepts for which a proteomic assay is likely to represent a surrogate outcome. Tests recommended by NICE include renal, thyroid, liver and lipid profiles, blood tests including HbA1c and full blood count, as well as urinalysis and lung function measurements.[2] It is not clear what additional information SomaScan would provide on these parameters.

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The information in this report is correct at the time of printing.