

Reducing deaths among older patients with NSTEMI heart attacks through invasive management

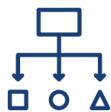
Invasive procedures to treat a type of heart attack called non-ST elevation myocardial infarction (NSTEMI) include angiography (injecting dye through a long tube into the heart's blood vessels for x-rays to reveal blockages) and revascularisation (widening of narrow or blocked arteries). Randomized trials showed that invasive procedures reduce deaths after NSTEMI, compared with non-invasive approaches. However, the trials included few elderly patients. Lack of evidence in elderly patients means they may receive unequal access to life-extending treatment.

What translational research was done?

The NIHR Health Informatics Collaborative (HIC) combines detailed linked electronic health record data across NHS Trusts. Analysing such data for translational research requires specialist expertise.

The NIHR HIC started as a collaboration between the five largest BRCs, though not all contributed to the cardiovascular dataset, managed by Imperial BRC. Working closely with Information Management at University Hospitals Bristol and Weston NHS Foundation Trust, we created a **detailed cardiovascular dataset** that was combined with those from other Trusts.

We developed methods to estimate the effect of invasive compared with non-invasive management of NSTEMI. We accounted for 'confounding' (presence of common causes of intervention and outcome) and 'immortal time bias' (where, during the period of observation, there's some interval when the outcome can't happen: a problem here because there's no fixed time when invasive intervention happens).



Translation into later phase research and practice

In partnership with Imperial BRC, we analysed **1,976 elderly patients with NSTEMI in the HIC cardiovascular dataset**. The adjusted 5-year mortality was 36% in the invasive management group and 55% in the non-invasive group. Invasive management was also associated with fewer hospital admissions for heart failure¹.

Combining the detailed HIC dataset with our novel analytic approach provided compelling evidence supporting invasive management for elderly people with NSTEMI, **three years ahead of the expected results of a randomized trial** (Senior-RITA) that's been recruiting patients since 2016.

This work was acknowledged in the European Heart Journal's special article 'The year in cardiovascular medicine 2020: Interventional Cardiology'.

Our study highlighted research questions for future studies, including the impact of frailty, appropriateness of additional medications, particularly anti-thrombosis (blood clot) therapy, and balancing ongoing bleeding with the risk of restricted blood supply. It will influence clinical practice and benefit elderly NSTEMI patients, ahead of randomized trial data.



Reference

1. Kaura et al., Lancet, 2020;DOI:10.1016/S0140-6736(20)30930-2