Early angiography and revascularisation for acute coronary syndromes in New Zealand

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In the late 1990s, a series of randomised trials demonstrated that, in patients with troponin-positive acute coronary syndromes (ACS), a strategy of early coronary angiography and revascularisation was associated with better clinical outcomes than an initial conservative approach. By 2002, international guidelines advocated—with a Class A recommendation—an invasive approach for most patients presenting with a non-ST elevation myocardial infarction.1 That year, Ellis et al undertook a 2 week ‘snapshot’ audit of what was happening in New Zealand.2 Coronary angiography was undertaken in 21% of 930 patients presenting with a suspected ACS. Of those subsequently diagnosed with non-ST elevation or ST elevation myocardial infarction, revascularisation was performed in only 11% and 17%, respectively. Few were prescribed dual antiplatelet therapy; while 82% were given aspirin, a mere 8% were also discharged on clopidogrel. Only 55% were given a statin. This audit clearly showed that, in many New Zealand hospitals, patients with an acute coronary syndrome were managed with a highly conservative approach.

In this issue of the Journal, Devlin and colleagues assessed whether the use of evidence-based treatments had improved over the next decade, comparing the 2002 data with subsequent audits from 2007 and 2012.3 The findings are largely reassuring. Angiography rates had increased from 21 to 46%. By 2012, revascularisation rates had also increased to 29%, and approximately 75% of patients were given dual antiplatelet therapy. Although these audits usefully assess changes in practice over time, they have limitations. Investigations and treatment undertaken after the initial hospitalisation were not included, and data collection relied on local investigators, with no mechanism for checking its accuracy.

In another paper in this issue, Williams et al looked further at whether differences in practice persist around New Zealand.4 Coronary angiography rates and time to angiography were compared by district health board, using data from the All New Zealand Acute Coronary Syndrome Quality Improvement (ANZACS-QI) registry. As might be expected, patients presenting to an intervention-capable hospital had a shorter time-to-angiography than in those without such facilities. Angiography rates were also 30% higher in angiography-capable units. While it is difficult to be certain regarding an optimal angiography rate, the percentage of patients with severe coronary disease suggests that New Zealand rates in general, and at non-interventional centres in particular, may be too low. Approximately 24% of patients had left main or 3-vessel disease, which is a considerably higher proportion than that found in a recent North American study (7% of patients in New York, US and 13% in Ontario, Canada).5

There are likely multiple reasons for the up to two-fold difference in angiography rates between regions. In smaller provincial centres patients with ACS are cared for by general physicians rather than cardiologists. The need to transfer patients to another centre may act as a barrier to referral. Some lower-risk patients with suspected ACS may have CT rather than invasive angiography to initially evaluate their coronary anatomy.
Reducing time to angiography in non-STEMI patients is of greatest clinical benefit in those at highest risk, who may have an adverse clinical event and develop more extensive myocardial necrosis while awaiting angiography and revascularisation. All patients, including those at lower risk, benefit from avoiding hospital-acquired problems, such as intravenous line infections. However, the major advantage to the health service is financial. The implementation of a 3-day door-to-angiography target as a district health board key performance indicator (KPI) has reduced average time-to-angiography by approximately 1 day. Coronary care and monitored cardiology beds are expensive ($1000–2000 per day), so across 8,000 patients each year the savings to the health service are substantial.

ANZACS-QI is a rigorous, prospective and comprehensive database on all patients with ACS undergoing angiography. The initial momentum for its development came from Andrew Kerr at Middlemore Hospital, with support from clinical and university colleagues. However, it would not have succeeded without government enthusiasm and funding, which was forthcoming from the Minister and Ministry of Health. The 3-day target time for angiography in ACS patients was an excellent choice as a KPI: clinically relevant, achievable and with the potential to save money. This has proven to be the case.

ANZACS-QI is now providing a wealth of information about the management of coronary disease in New Zealand. Merging data from other sources, particularly the national mortality, hospital discharge diagnosis codes and pharmacy registries, creates a powerful tool for predicting longer-term outcomes. Examples of other recent studies from this database include an assessment of statin medication compliance 3 years after an acute coronary syndrome, the impact of patient ethnicity on rates of angiography and revascularisation, and a comparison of radial versus femoral access for angiography. Although New Zealand radial access rates are amongst the highest in the world, there are considerable differences between units. Outcomes were better with radial than femoral access, which is consistent with randomised trial data. While there are potential confounders—femoral access may have been used in higher-risk patients, and predominantly radial units and operators were mostly higher volume—real-world all-comers data are an important adjunct to that from a selected trial population.

The potential for ANZACS-QI extends well beyond short-term audit and quality control of local practice. Research can be undertaken by adding database fields for the duration of a study, and national registries used to collect relevant endpoints. This type of research was pioneered in Scandinavia, where a series of landmark trials have been undertaken at far lower cost than similar studies from the US or elsewhere in Europe. New Zealand is now well placed for such research; being small and somewhat isolated is, for once, to our advantage. Beyond the usual randomised trials with individual patient consent, there is also the potential to undertake systems research, comparing ‘routine’ practices applied to large groups of patients.

In summary, ANZACS-QI is an example of money well spent in a public health service looking to achieve both optimal clinical outcomes and efficient health service delivery. Without good data, it is easy to repeat the mistakes of the past. As Lord Kelvin said “to measure is to know”. It is vital that we evaluate our practice in an ongoing and rigorous manner, while keeping in mind another Lord Kelvin quote: “X-rays will prove to be a hoax”; it is also important to maintain a healthy scepticism regarding our currently-held beliefs.
Competing interests: Nil

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