Angioplasty, bypass surgery or medical treatment: how should we decide?

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ABSTRACT
Coronary revascularisation continues to be underused despite evidence that this results in poorer outcomes

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Keywords: angioplasty; coronary artery bypass graft surgery; coronary artery disease

Abbreviations: ACRE, appropriateness of coronary revascularisation; CABG, coronary artery bypass graft; CAD, coronary artery disease; PCI, percutaneous coronary intervention

There are wide variations in revascularisation rates throughout the UK which cannot be explained by geographical variations in the incidence of coronary artery disease (CAD).[1–3] In the USA, intervention rates are double those in the UK.[4] Nonetheless, it has been suggested that coronary revascularisation rates may be insufficient in some areas of the USA.[5,6] Under provision of revascularisation in some areas may be responsible for preventable morbidity and mortality,[7] and inequalities in health. Low rates are a result of poorer access to angiography and specialist services within some areas.[8] In the UK, attempts are being made to address this through the appointment of more cardiologists.

The ACRE (appropriateness of coronary revascularisation) study used the Delphi method to define, in detail, the criteria by which patients should be selected for coronary angiography and subsequent revascularisation.[9] This is a validated and widely used method for achieving multidisciplinary consensus.[10] The principal advantage of the Delphi method, over other consensus methods, is that the panel of experts are polled individually and anonymously, thereby assuring that equal weight is given to all participants. It has been used previously in a number of other countries,[11–13] as well as the UK,[14] to agree selection criteria for coronary interventions. Delphi panel results should only be applied in the countries in which they are developed since cultural differences may influence interpretation of published literature.[11] The ACRE study went further than previous studies in determining the extent to which Delphi scores were predictive of clinical prognosis.

The ACRE expert panel consisted of cardiologists, surgeons, general physicians, and general practitioners.[9] The panel members were presented with more than 900 case scenarios, based on possible permutations of clinical and diagnostic information,

which they scored according to their appropriateness for coronary revascularisation. The results of the consensus process were then applied to a prospective cohort of patients who underwent coronary angiography.[7] The appropriate management of these patients, as defined by the Delphi method, was compared with their actual management and their clinical outcome. The Delphi score was predictive of adverse clinical outcome, with evidence of a dose effect between the coronary artery bypass appropriateness score and subsequent all cause death or myocardial infarction. The investigators demonstrated that coronary revascularisation was often not used in patients in whom it was judged appropriate. Follow up of these patients suggested that failure to use revascularisation where warranted resulted in poorer outcome.

WHO DOES DECIDE?

Following detection of CAD at coronary angiography, a decision must be taken on whether to attempt revascularisation, and whether this should be done by coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI). The cardiologist who performs the angiogram may, or may not, perform PCIs. Also, the angiogram may be performed in a large teaching hospital which has both PCI and CABG on site or in a district general hospital where only PCI or neither service is available. These factors should influence neither the likelihood of revascularisation being offered nor the type of revascularisation chosen, but they do. There is a large body of published evidence demonstrating that patients investigated within a hospital where procedures are performed are significantly more likely to undergo the procedure than those who require referral from another hospital.[3,8,15,16]

A survey which we recently conducted during the Scottish Cardiac Society's annual meeting demonstrated that clinicians' views of the suitability of a procedure were influenced by whether or not they personally performed the procedure, with interventional cardiologists preferring PCI to surgery and surgeons preferring surgery to PCI.[17] This survey demonstrated that discussion between interventional cardiologists, non-interventional cardiologists, and surgeons increased consensus on the management of patients. But to what extent is multidisciplinary discussion a routine part of clinical practice? Traditionally, the cardiologist who performs the angiogram has acted as the gatekeeper to revascularisation. In many centres, discussion with cardiac surgeons about possible surgery or interventional cardiologists about possible PCI takes place only in those patients whom the gatekeeper has already decided is suitable for that intervention. Patients screened out by the gatekeeper do not benefit from such discussions.

WHO SHOULD DECIDE?

Within cancer services, it is now accepted good practice that elective patient management be decided by a multidisciplinary team including surgeons, oncologists, and radiotherapists in district general hospitals as well as in tertiary centres.[18] Could a similar model be adopted for elective coronary revascularisation? At present, cardiologists who undertake angiography in tertiary centres have ready access to cardiac surgeons and other cardiologists. In some tertiary centres there are formal

opportunities for discussion through weekly meetings at which cases are discussed and management agreed, as well as informal opportunities for discussion in the corridor. At present, these opportunities are not available to many cardiologists working in district general hospitals. Given the numbers of patients requiring coronary angiography and the need to ensure patient access, restricting coronary angiography to tertiary centres is not an option.[12] Therefore, a mechanism needs to be found to ensure that those who work in district general hospitals have regular access to cardiac surgeons and, where appropriate, interventional cardiologists. In the future, facilities such as tele-medicine and video conferencing may be sufficiently widespread within the National Health Service to support virtual meetings. Until then, regular face to face meetings are the only solution.

HOW SHOULD THEY DECIDE ?

Multidisciplinary meetings provide a mechanism for ensuring high quality, consistent care for those patients managed electively. They are less useful as a vehicle for deciding the management of those patients treated as emergencies or those undergoing follow on PCIs. However, they may nonetheless improve the care of these patients because of their general educational value. Whether clinical decisions are taken at multidisciplinary meetings or by individual clinicians, they need to be informed by national evidence based guidelines. The Delphi method provides one mechanism of collating the results obtained from numerous published studies together with clinical experience so that evidence based clinical guidelines and audit standards can be produced. However, as with all guidelines, those produced via the Delphi method need to be regularly updated as new evidence becomes available. The recommendations of the ACRE study already need to be reviewed in light of recently published trial results of PCI in patients with multivessel disease.[19] It is incumbent on those who produce guidelines to ensure that mechanisms are in place for reviewing and updating their content.

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