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Percutaneous coronary intervention – what is the risk of inadequate risk assessment?

Following the Bristol Inquiry, the Kennedy report in 2001 listed 198 recommendations. Among these was the recommendation that 'patients and the public must be able to obtain information as to the relative performance of the Trust and the services and consultant units within the Trust'.[1] This justifiably stimulated great public and media interest and contributed to formalised scrutiny, with the formation of organisations such as Dr Foster – an independent organisation 'that aims to improve the quality and efficiency of health and social care through better use of information'.[2] Such scrutiny has so far turned out to be formalised but scientifically undisciplined.

The Society of Cardiothoracic Surgeons of Great Britain and Ireland had already established a national cardiac surgical database in 1994, which allowed monitoring of in-hospital mortality rates and comparison between and within different units. In November 2001, Dr Foster published a league table of hospitals and individual cardiothoracic consultants in *The Times*, based on standardised mortality ratios.[3] Whilst they were able to take account of the effects of age, gender, socio-economic status and urgency of surgery, they were not able to adjust for well documented parameters of high risk such as impaired left ventricular function, diabetes and renal impairment.

It is clear that such publication has a downside. Produced in a manner that is not adjusted for pre-procedure risk, the figures will not be fully accessible to a lay readership. For example, the average member of the public will not understand that Surgeon A may be considered so good that he or she is referred the most difficult and high-risk cases by colleagues. The mortality ratios of Surgeon A may appear high compared with those of Surgeon B or C but this may reflect the fact that amongst his or her peers, only Surgeon A is considered skillful or experienced enough to take on such high-risk cases at all! Thus, without adequate explanation of the data, published league tables taken at face value could be unjustifiably damaging to the reputation of institutions and individual consultants. The natural response to this sort of data publication is that 'less well-performing' individuals will simply avoid taking on high-risk cases in order to protect or promote their position in the league table.[4] The paradox is that these highest-risk patients are often also those who have the most to gain prognostically from surgery.

Surgical risk scoring systems

Our cardiothoracic colleagues have led the way, not only in terms of robust data collection systems, but also in the development of surgical risk scoring systems such as Parsonnet and Euroscore,[5,6] which allow assessment of risk-adjusted mortality rates. Similar league tables for interventional cardiologists are surely inevitable and with them will arise similar concerns about how the data are presented and their impact on clinical practice. It is therefore up to us as a profession to ensure that the data upon which they are based are complete and accurate, and that we have an adequate risk scoring system to allow estimates of risk-adjusted mortality and major adverse cardiac events (MACE) rates. Without this, the temptation to avoid intervention for high-risk cases (such as cardiogenic shock, in which we may save a couple of lives for every 10 patients treated, but still have an overall mortality of 50%) will mount.

Risk scoring systems for PCI

The excellent review in this edition of the Journal (see pages 39–45) summarises the currently published risk assessment models for percutaneous coronary intervention (PCI).[8] The eight models (two European and six from the US) were developed on patients undergoing PCI between 1992 and 2001. Three of the models looked at in-hospital mortality alone, while the other five included myocardial infarction (MI) or MACE. The authors tested five of the 'bed-side' models against hypothetical cases to assess the differences between them. They noted that the Boston and Mayo Clinic models provided better discrimination than the other models, and fared best in this exercise.

It is clear that contemporary PCI practice has evolved significantly over the past decade, with expanded indications for drug-eluting stents (DES) and advances in pharmacotherapy, including low molecular weight heparins, thienopyridines, glycoprotein IIb/IIIa inhibitors and direct thrombin inhibitors. Furthermore, the complexity of cases being taken on for PCI has increased, and with it, so has the risk profile. There is, of course, a less defensive reason for accurate risk assessment that relates to informed consent and the decision-making process leading up to it.[9] There are now reproducible data available in the UK via the British Cardiac Intervention Society (BCIS) audit returns that allow a generic estimate of risk to be

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quoted when consenting patients for both elective and urgent PCI. For example, from the 2004 data, overall in-hospital mortality for PCI was 0.56%. Risk can be further stratified by presenting syndromes into elective PCI 0.24%; unstable angina/non-ST elevation myocardial infarction (UA/NSTEMI) 0.89%; primary PCI 3.5%; rescue PCI 3.5% and cardiogenic shock 36%. Emergency coronary artery bypass grafting (CABG) was required in 0.21% of all cases and Q-wave MI occurred in 0.3% of cases.[10]

The ideal risk 'scoring' system would incorporate pre-investigation parameters, as well as careful angiographic data assessment, as recently introduced by the SYNTAX group.[11] However, thorough assessment of risk and its interpretation at angiography will inevitably raise questions about the timing of consent and the practical and ethical viability of 'stand by' or '? proceed' angiograms.

The authors of this review correctly call for an up-to-date, practical scoring system based on prospectively collected, accurate, multicentre data. The establishment of the BCIS PCI database, where all institutions performing PCI procedures are required to send a minimum dataset to the Central Cardiac Audit Database (CCAD) servers, will provide a logical platform from which to develop a contemporary and, importantly, updatable scoring system. It is a priority that we strive to achieve this in order to maintain the highest standards of clinical practice, as well as produce a defensive response to the inevitable publication of league tables!

Conflict of interest

None declared.

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