Editorials

The coronary care unit: a 35-year perspective

See page 813 for the article to which this Editorial refers

More than 35 years have elapsed since Day reported his first experience with an 'intensive coronary care area'[1]. During this substantial period, the concept of intensive coronary care has been studied many times. It is interesting to note that many of the early studies were unable to document benefit from this expensive form of hospital management[2,3]. As recently as 1987, Reznik et al, concluded that the 'increased resources for coronary care units . . . may not be required'[4]. However, such negative findings did not go unchallenged. Hofvendahl, in Sweden, and Christensen et al., in Denmark, reported benefits for patients with acute myocardial infarction who were hospitalized in coronary intensive care units (CCUs) compared with patients cared for on general internal medicine wards. The debate over the value of the CCU was vigorous during the 1970s and 1980s. I was once told by an attending physician during my training years, that coronary care was an expensive but rather useless form of 'infarct baby sitting'.

With the introduction of thrombolytic therapy — both pharmacological and interventional — this debate largely evaporated. The opponents of coronary care may have retired or died while their younger colleagues, having grown up with CCUs, never questioned the validity of this form of care. Perhaps it seemed obvious that the new aggressive direction that coronary care had taken during the late 1980s required the support of a dedicated CCU where patients could be closely monitored before and after potentially life-threatening interventions. Regardless of the reasons, coronary care has become the gold standard for patients with acute myocardial infarction and unstable angina. There have always been some reservations about the cost-effectiveness of coronary care for every patient with chest pain. This scepticism was particularly intense in my case when dealing with patients admitted for 'soft rule-out myocardial infarction', i.e. those patients whose history, physical examination, ECG and early enzyme results suggested that the correct diagnosis was not an acute coronary syndrome. Recent work suggests that such patients are best cared for in a rapid turnover chest pain unit attached to the emergency ward where patients can be discharged within as little as 6 h from the time of admission[5].

What can be said about patients with true acute coronary syndromes? Do they benefit from CCU admission with the concomitant aggressive therapeutic intervention that occurs in such units? The answer, according to the study of Rotstein et al.[6] published in this issue, appears to be yes. The era has gone when randomized studies of CCU admission for acute myocardial infarction can be performed. The widespread belief that such units are beneficial makes it ethically unacceptable to assign patients randomly to CCU care. Hence, we must depend on careful retrospective analyses such as that performed by Rotstein et al.[6] in order to decide whether CCU care is currently effective. These authors studied more than 2000 admissions to a major urban tertiary care centre in Israel’s largest city, Tel Aviv. Because this hospital is extremely busy and has limitations on the number of CCU beds available, some patients with acute coronary syndromes were admitted to general internal medicine wards. In the CCU, patients were cared for by cardiologists while on internal medicine floors patients were cared for by internists who sought cardiology consultation when they felt it was indicated.

The results were striking. The mortality for patients admitted to general medicine floors was almost three times greater than that for individuals admitted to the CCU. Admittedly, patients admitted to general medicine wards were on average 11 years older, more frequently women and had fewer anterior wall myocardial infarctions. Medicine ward patients were also more ill with more previous infarcts, more heart and renal failure, and more cancer. As one might expect, CCU patients were treated more aggressively. Almost 60% of CCU patients received some form of reperfusion therapy whereas only 2·5% of ward patients were given this therapeutic modality, so that the difference in mortality between the two units is not surprising.

It might be concluded from this analysis that the difference between the patient outcomes was the
result of differences in reperfusion therapy rather than differences in where patients were admitted. The authors, however, have performed a multivariate analysis in order to control for various demographic, severity and therapeutic inequities between the two patient populations. Hospitalization on an internal medicine ward remained an independent predictor of mortality even after correction for the above-cited differences in patient characteristics. The authors conclude that CCU admission with concomitant cardiological care improves outcomes for patients with acute coronary syndromes.

All such retrospective studies are fraught with limitations that impair clearcut conclusions that the differences observed truly exist. Nevertheless, this kind of data is the best we can hope for, given the current status of coronary care. The authors are careful to point out the various limitations inherent in their observational study: lack of randomization, unknown and unmeasured confounders, subtle and undetected patient selection, and undetermined differences in therapy between the two patient populations. In the final analysis, the reader is forced to draw his/her own conclusions, weighing the data presented against the possible limitations inherent in this form of analysis. For my part, I believe that the data do reflect reality, and that coronary intensive care units, with all that they entail, do improve the prognosis for patients with acute myocardial infarction and unstable angina.

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References

Reperfusion therapy for acute myocardial infarction: can the improvement in early survival be extended over time?

See page 819 for the article to which this Editorial refers

In this issue the long-term follow-up of the randomized trial by the Interuniversity Cardiology Institute in the Netherlands (ICIN) is reported[1]. A sustained survival benefit was observed throughout the 10 years of follow-up in 533 patients randomized to reperfusion therapy or conventional treatment. These results, obtained in a relatively small population, at first glance confirm the 10-year survival results of the much larger trials GISSI-1 and ISIS-2[2,3] recently published. In these two large studies of intravenous streptokinase, an absolute survival benefit of approximately 2% was observed at 10 years (1.9% in GISSI-1, 2.3% in ISIS-2) which very much contrasts with the 10% absolute survival benefit observed in the ICIN trial. Why is the absolute survival benefit four to five times greater in the ICIN trial and why do all three studies fail to show an extra late benefit?

The early selection of patients for treatment (475 of the 533 patients were randomized within 2 h) together with a very aggressive reperfusion strategy (intravenous or intracoronary streptokinase followed by mechanical perforation of the thrombus in cases of failed thrombolysis or angioplasty in cases of a tight residual stenosis) can explain the much greater survival benefit observed in the Dutch trial[4]. In GISSI-1 and ISIS-2 only a minority of the patients were treated within the first 2 h and many patients received streptokinase well beyond the time window for salvage of ischaemic myocardium. Furthermore, although no early angiography was performed in GISSI-1 and ISIS-2, the coronary artery patency rate