

Editorial

Role of a New Cardiac Catheterization Laboratory in Advancing Cardiovascular Care and Outcomes in Post-Myocardial Infarction Patients

Papel de un nuevo laboratorio de cateterismo cardiaco en la mejora de la asistencia cardiovascular y sus resultados en pacientes con infarto de miocardio

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Cardiovascular disease (CVD) is the leading cause of death in the European Union (EU) and accounts for about 40% of all deaths or approximately 2 million deaths per year.¹ CVD also poses a significant financial burden for EU healthcare systems, which has been estimated to be just under €110 billion (2006).¹ In Spain, CVD represents the number one cause of death, accounting for almost 34% of all mortalities. Within this group, ischemic heart disease is the leading cause of death in men.

These sobering statistics clearly emphasize the critical need to better define and enact specific healthcare plans and approaches to mitigate the consequences of acute myocardial infarction (MI), which represents the most severe—yet eminently treatable—expression of CVD through enhanced patient access to specialized tertiary services and life-saving technology. There is an abundance of medical literature to support the important role for the prompt and timely diagnosis and management of patients with acute MI, particularly with the advent of primary percutaneous coronary intervention (PCI) for acute MI and acute coronary syndromes.

In this issue of *Revista Española de Cardiología*, the REGICOR investigators report their single-site clinical experience of outcomes using a longitudinal, comparative analysis before and after the establishment of a cardiac catheterization facility.² In this study the REGICOR authors evaluated the impact of opening an on-site diagnostic cardiac catheterization facility on 30-day and 2-year cardiovascular mortality in patients aged 25–74 admitted with acute MI. The authors compared clinical outcomes of MI patients during two temporal periods of observation, one of which (from 1995–1997) was defined as the first, or referent, period, and a later time interval (from 1999–2003) that was defined as the second period, with access to the cardiac catheterization laboratory that opened in 1998. As part of this temporal “before and after” analysis, the authors prospectively evaluated 1,539 consecutive acute MI patients, of which 641 were admitted with

acute MI in the first, pre-catheterization laboratory period and 898 consecutive MI patients who were admitted with acute MI in the second, post-catheterization laboratory period. As noted above, the primary outcome measure for this comparative analysis was 30-day and 2-year cardiovascular mortality. A secondary objective was to compare the effect of the post-MI discharge medication regimen on clinical outcomes in these patients.

In light of the continued evolution in the definition of acute MI that has occurred over the past decade (most recently, the new American College of Cardiology [ACC]/American Heart Association [AHA]/European Society of Cardiology [ESC] MI Guidelines^{3,4}) and because of increasingly more sensitive and sophisticated biochemical assays to detect smaller amounts of myocardial necrosis during the study periods, there is not a standardized or uniform definition of MI in this temporal assessment of MI outcomes by the REGICOR Group investigators, as compared with the current MI definition. Moreover, in-person follow-up was not directly ascertained in this study, inasmuch as a telephonic 2-year follow-up was conducted on patients who survived the first 30 days after index MI event. Nevertheless, the authors found—perhaps not surprisingly—that concomitant with the availability of an on-site catheterization laboratory, the number of coronary catheterization and PCI procedures increased. Additionally, time-to-procedure decreased in the second time period, as would be expected with the advent of an on-site, invasive facility. The principal findings of the current study reveal that at 30 days the rate of death or post-infarction angina was lower in the second period, with the initiation of an on-site cardiac catheterization laboratory, and at 2 years of follow-up the all-cause and cardiovascular death rates were likewise lower in the second period, which in part may also be contributed by the increased use of evidence-based medical therapy for these MI patients at hospital discharge. However, just as cardiac catheterization and catheter-based intervention has evolved dramatically over the past 10–20 years, so too has the robustness and intensity of medical therapy and secondary prevention. With mounting (and compelling) scientific evidence derived from multiple randomized trials, it is clear that physicians have a wider therapeutic armamentarium from which to choose clinically in MI patients, including

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thrombolytics, antiplatelet drugs, angiotensin converting enzyme inhibitors, statins, and beta blockers;^{5–9} clearly, the utilization of these drugs at time of discharge increased significantly in the second study period and may, in part, explain the improvement in clinical outcomes observed in this temporal analysis. One shortcoming of the present analysis is that medication usage and the compliance rate at 2 years was not measured, so it is difficult to determine how much of the improved clinical outcomes observed were attributable to the new on-site invasive capability as compared with more intensive use of aggressive medical therapy and secondary prevention. It is likely that both were important factors in the improved outcomes observed in this study.

Although all-cause mortality and cardiovascular death at 2 years were lower, there was no significant difference in the rate of myocardial infarction and unstable angina at the end of 2 years. Of note also is the fact that the rate of repeat cardiac catheterization and PCI at the end of 2 years increased in the second period. This highlights the realization that, while the availability of a catheterization laboratory does decrease the mortality in MI patients, there may be increased procedural utilization and there has to be recognition that additional therapeutic modalities are needed to optimize long-term morbidity in these patients, regardless of whether they do or do not undergo an early invasive approach.

Overall, the authors of this study² have very well demonstrated the advantage of having an on-site cardiac catheterization laboratory for improving outcomes in patients admitted with MI by comparing two time periods before and after the creation of such a new invasive facility in a tertiary hospital in Spain. In further support of this management approach, a recent meta-analysis of randomized trials of acute coronary syndromes has demonstrated that the early invasive strategy reduces cardiovascular death and MI at up to 5 years of follow-up.¹⁰ Also, in patients with ST-segment elevation MI (STEMI), both ACC/AHA and ESC guidelines currently recommend primary PCI as the treatment of choice if possible, as it significantly decreases mortality.^{3,4} This emphasizes the advantage of having a cardiac catheterization laboratory on-site so that the early invasive treatment may be offered to those high-risk patients who are most in need, and who are most likely to derive significant clinical benefit.

While it is abundantly clear that new technology enhances care and clinical outcomes, it is likewise essential to use new technology appropriately and judiciously, and to avoid its use (or potential abuse) in low-risk patients or in those where objective evidence of ischemia is lacking. The presence of a fully functional and equipped cardiac catheterization laboratory is essential for a tertiary medical center to provide state-of-the-art treatment, particularly in patients presenting with acute STEMI

and high risk non-ST-segment elevation myocardial infarction, where on-site cardiac catheterization laboratory access facilitates early invasive treatment of these high-risk patients which, in turn, results in overall better outcomes. Lastly, while this study highlights the better mortality outcomes of the patients admitted with MI to the hospital and undergoing an early invasive approach (including PCI), it should also be underscored that overall long-term clinical improvement requires careful lifestyle intervention, intensive medical therapy, and appropriate secondary prevention of cardiac risk factors as essential components of optimal management and improved prognosis.

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