

PublisherInfo		
PublisherName	:	BioMed Central
PublisherLocation	:	London
PublisherImprintName	:	BioMed Central

Temporal trends in cardiogenic shock complicating MI

ArticleInfo		
ArticleID	:	4079
ArticleDOI	:	10.1186/ccf-1999-122
ArticleCitationID	:	122
ArticleSequenceNumber	:	16
ArticleCategory	:	Paper Report
ArticleFirstPage	:	1
ArticleLastPage	:	4
ArticleHistory	:	RegistrationDate : 1999-5-7 OnlineDate : 1999-5-7
ArticleCopyright	:	Current Science Ltd1999
ArticleGrants	:	
ArticleContext	:	130541111

Keywords

Cardiovascular system

Comments

Although providing only level V evidence, this study involved a very large sample size and so its findings are important. The authors are, however, unable to answer questions concerning the benefits of newer therapies. Much greater survival benefits over time may have been masked by the treatment of sicker patients with reperfusion therapies and aortic balloon counterpulsation.

Introduction

Cardiogenic shock complicating myocardial infarction carries a poor prognosis despite newer treatment strategies involving early coronary reperfusion. Information is lacking on the changing incidence of, and mortality associated with, cardiogenic shock over the last 20 years, and that which is available relates to single institutions and tertiary referral hospitals. Examining data covering the periods before and after the introduction of thrombolytic therapy in the mid-1980s may be important in identifying the cost effectiveness and the effect on outcome of new treatments used in the prevention of cardiogenic shock.

Aims

An observational study to investigate the change in incidence and mortality from cardiogenic shock, between 1975 and 1997, in all patients admitted with acute myocardial infarction to hospitals in the Worcester metropolitan area, Massachusetts.

Methods

The medical records of 9076 patients identified with the diagnosis of acute myocardial infarction and admitted to local hospitals in Worcester between 1975 and 1997 were examined. The diagnosis of cardiogenic shock was made on the basis of hypotension, despite adequate volume status (systolic blood pressure less than 80 mmHg), in association with oliguria, cyanosis, cool extremities, congestive cardiac failure and altered mental behaviour. Data collection included recording coronary reperfusion treatments as they appeared, as well as relevant patient demographics and co-morbidities.

Results

Demographic analysis revealed that patients with cardiogenic shock were more likely to be older, female, with a history of diabetes or stroke, and have had repeated anterior Q-wave acute myocardial infarctions. Not surprisingly there was an increased use of reperfusion treatments over the time period of the study. Patients with cardiogenic shock were much more likely to receive intra-aortic balloon counterpulsation over the study duration.

The mean incidence of cardiogenic shock was 7.1% and the risk did not change for the period of the study even when adjusted for confounders. Those with myocardial infarction complicated by cardiogenic shock were much more likely to die in hospital when compared to patients without this complication, although the incidence reduced during the period of the study from a mean of 77% up until the early 1990s, to 59% in 1997. This improvement in survival remained valid when multivariable regression analysis was performed to control for other prognostic variables. Those that survived cardiogenic shock were younger and more likely to have been treated with angiotensin converting enzyme (ACE) inhibitors, beta-blockers, antiplatelet agents, digoxin and thrombolysis.

Discussion

In this community the incidence of cardiogenic shock has remained static over the 23-year study period, and although mortality was much higher in the group developing this complication following acute myocardial infarction, the survival rate has improved over time. The authors comment that because of the study design they were unable to prove that the improved survival was directly a consequence of reperfusion therapies, but it would seem probable in view of the results of GUSTO-1. In this world-wide randomised study, cardiogenic shock was significantly less in those patients treated with accelerated r-TPA.

The improved survival may also have been a consequence of improved treatment for cardiac disease such as beta-blockers, ACE inhibitors, etc. Although this study showed an increased use of intra-aortic balloon counterpulsation, angioplasty and bypass grafting for cardiogenic shock over the study period, the study design failed to allow any conclusions to be drawn. In other studies, the increased use of intra-aortic balloon counterpulsation has been shown only to delay death, despite improved hemodynamic variables and only uncontrolled or non-randomised studies have shown improvements in survival for angioplasty and bypass grafting in cardiogenic shock.

The authors call for a multicenter, randomised trial to answer the question whether aggressive reperfusion strategies in acute myocardial infarction will improve the incidence and mortality associated with cardiogenic shock.

References

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