Coronary angiography in NSTEMI: a timely intervention?

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Background

Non-ST segment elevation acute coronary syndrome (NST-ACS) is the most common manifestation of ACS with some patients experiencing cardiomyocyte necrosis (NSTEMI) or myocardial ischaemia without cell loss (unstable angina) at a histological level. Coronary angiography (CA) with stenting is the treatment of choice. Risk factor stratification is essential to determine the timing for angiography and revascularisation [1].

Aim

The aim of this audit is to determine compliance with the European Society of Cardiology (ESC) recommendations 2015 for the timing of invasive CA and revascularisation in NST-ACS. These recommend urgent CA (<2 hours) in very high risk patients, within 24 hours in patients at high risk with a Global Registry of Acute Coronary Events 2.0 (GRACE) risk score of >140 or with at least one major high risk criterion, and within 72 hours in lower risk patients with at least one intermediate risk criterion [1].

Method

Case summaries issued from Mater Dei Hospital, Malta, with a diagnosis of NSTEMI and sufficient data information to assess the risk profile of the patient between February and July 2017, for 100 patients who underwent invasive CA while inpatients were analysed by 2 authors according to the set guidelines. The GRACE score for 6 months was calculated using the GRACE 2.0 ACS risk calculator. All data was kept confidential according to the Data Protection Act.

Results

Of 100 patients undergoing CA between February and July 2017, 21 were female and 79 were male, and their ages ranged between 41 and 86 years.

21% had at least one very high risk criterion, 98% had at least one high risk criterion and 71% had at least one intermediate risk criterion. Of the 21 patients at very high risk, 5% were haemodynamically unstable and 15% were in acute heart failure at presentation. Of the 98 patients with high risk criteria, 17% had a GRACE score value of >140, 97% had changes in serum troponin levels and 53% had ST or T wave changes on an admission electrocardiogram.
Of the 71% at intermediate risk, 29% of the patients had a GRACE score of <140 and >109, 40% had a history of diabetes, 24% had renal insufficiency, 17% had congestive heart failure or an ejection fraction of <40%, 20% had undergone a previous percutaneous coronary intervention and 16% had undergone a previous coronary artery bypass grafting surgery.

7% underwent CA on same day, 28% underwent the procedure within 1 day, 33% underwent CA within 2 days, 18% within 3 days and 14% underwent angiography beyond 3 days (in 2% more than 6 days later).

Only 25% of patients underwent invasive intervention on time as recommended by the ESC guidelines. 31% underwent CA 1 day late, 21% were 2 days late, 18% were 3 or more days late, and 7% underwent coronary angiography at least 1 day early. Where CA was delayed, 9 patients had a clinical reason for the delay documented in their case summaries while 5 patients did not.

Conclusion

The findings suggest that although it is only in 14% of patients that the invasive intervention was delayed beyond 72 hours, in 75% of the patients studied the timing of the CA was not compliant with international recommendations.

The main limitation of the audit was that door-to-balloon-time was not calculated as per guidelines with cut off times of 2, 24 and 72 hours, but was instead calculated in days as the time of diagnosis was not available in the data programs used for analysis.

Recognition of the importance of assessing the patient's risk profile including a calculation of the GRACE score is vital to improve compliance with international recommendations. Documentation of the GRACE score and the time of diagnosis is recommended as a means of prioritising invasive coronary angiography.

References

1. Bueno, H., Bugiardini, R., Carerj, S., & Casselman, F. (2015). 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation.