RISK STRATIFICATION IN ACUTE CORONARY SYNDROME

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ABSTRACT

Consensus guidelines recognise the importance of early risk stratification in the management of non ST elevation ACS and recommend the integrated approach to risk assessment. Clinical features and presentation can facilitate categorisation of patients into low, intermediate and high risk groups. Application of validated risk scores may help refine risk stratification and assessment by physicians in their clinical practice.

Metabolic syndrome, characterised by clustering of risk factors, predisposes subjects to increased risk of Diabetes Mellitus and Cardiovascular Disease (CVD). Coronary Artery Disease has now assumed the dimension of public health problem in India.

The “epidemiologic transition” has had its health aftermath in South Asia. With better understanding of the pathophysiological dynamics of Atherosclerosis and Endothelial Dysfunction, the erstwhile simplistic notions of the continuum of CAD have been crystallised into Acute Coronary Syndrome, that encompasses a range of thrombotic coronary artery diseases, including unstable angina and both ST segment elevation and non ST segment elevation myocardial infarction. Initial presentation and early management of unstable angina, STEMI and NSTEMI frequently are similar. Temporally; risk stratification allows appropriate referral of patients to Emergency Department. Most high risk patients require hospitalisation. Intermediate risk patients undergo structured evaluation. Troponin T is a sensitive determinant of ACS. Myoglobin and creatine kinase- MB subforms or isoforms can also be used. Low risk patients can discharged with appropriate instructions on follow up. Risk stratification to determine the likelihood of ACS, thus includes: History (Chest or left arm pain), physical examination (hypotension, diaphoresis and pulmonary rales), 12 lead ECG with new ST -segment deviation / T wave inversion), Elevated serum cardiac Markers like Troponin T or CK-MB (single / serial assays). Patients with elevations of both CK-MB and troponins are considered to have AMI. Troponins tend to remain elevated for upto two weeks after onset of initial symptom. Myoglobin has low cardiac specificity but high sensitivity.

Risk Scores: The clinical trials data have provided evidence to develop guidelines for risk stratification of UA/NSTEMI. The three major determinants of prognosis in ACS include a) Extent of myocardial injury b) Extent of coronary artery disease c) The instability of the disease and its refractoriness to management. The scores can provide ability to assess risk for in-hospital and short term mortality. Age, Killip class, heart rate, systolic blood pressure, ST segment deviation, resuscitation from cardiac arrest, serum creatinine concentration, and raised cardiac enzymes were powerful predictors of prognosis in almost all patients.

The ACC /AHA and the ESC consensus guidelines of 2002 recognise the importance early risk stratification in the management of non ST -elevation ACS and recommend an integrated approach to risk assessment. The three major scores are discussed in brief: TIMI - The score appeared to look more at the extent of the coronary artery and its instability. The TIMI RS was the sum of 7 dichotomous variables- age, >65 years, >3 risk factors for CAD, use of aspirin within past seven days, known coronary stenosis >50%,>2 episodes of angina within the past 24 hrs, ST segment...
deviation and elevated cardiac biomarker. The thrombolysis in Myocardial Infarction (TIMI RS) was derived from clinical trial population.

The PURSUIT RS included both dichotomous and continuous variables comprising age, gender, worst Canadian Cardiovascular Society angina class in previous 6 weeks, heart rate, systolic blood pressure, signs of heart failure, and ST depression. The Platelet glycoprotein IIB/IIa in Unstable angina: Receptor Suppression Using Integrilin Therapy (PURSUIT RS) was derived from clinical trial population.

The Global Registry of Acute Cardiac Events risk score GRACE RS, developed from an international registry, had as its components age, heart rate, systolic blood pressure, Killip class, cardiac arrest, serum creatinine, ST-segment deviation, and cardiac biomarker status. In a study to compare 1) the in -hospital and one year prognostic accuracy of PURSUIT RS, TIMI RS, and GRACE RS and 2) to determine their incremental prognostic value beyond patient risk assessment by treating physicians, it was noticed that, both PURSUIT RS and GRACE RS allow better discrimination or in hospital and one year mortality in patients presenting with a wide range of ACS; further all three risk scores confer additional important prognostic value beyond global race assessment by physicians.

Morphological variability (MV) in ECG could be used for risk stratification following ACS. Long term Outcome: Risk stratification in individuals who have survived the initial hospitalisation without acute myocardial infarction; there is considerably high incidence of medium to long term adverse outcomes. Death may range from 1.7% after one month to 9.5% after two years. C reactive protein, troponin T, heart rate, ST-segment depression on standard ECG, diabetes, congestive heart failure, creatinine clearance, N-terminal pro-brain natriuretic peptide, old age, use of two or more anti anginal drugs at admission are independent long term predictors of death from cardiac causes. Prospective and cohort studies have identified that ST shifts at 24 hour ECG recordings and autonomic imbalance are factors independently predictive of post discharge outcome. Genomic Stability, the near normal “Metabolic’ milieu, and sustained or persistent Autonomic Balance could well be factors favouring long term survival. Optimal Medical Therapy (OMT), comprising of five drug classes- aspirin, beta blockers, statins, RAS blockers, thienopyridines have been shown in clinical trial to substantially improve the prognosis of patients with acute myocardial infarction.

To conclude, physicians ability to risk stratify patients may depend on their knowledge and experience. Validated risk scores application can improve the process of risk stratification with probable benefit in treatment decision and patient outcome.

REFERENCES