The prognostic significance of grade of ischemia in patients with STEMI: a substudy of the randomized trial of primary PCI with or without routine manual thrombectomy (TOTAL trial)

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Background: The importance of grade of ischemia (GI) classification in the risk assessment of patients with ST-elevation myocardial infarction has been shown previously. Grade 3 ischemia (G3I) is defined by the Sclarovsky-Birnbaum grading system as ECG with ST-elevation and distortion of the terminal portion of the QRS complex in two or more adjacent leads, while grade 2 ischemia (G2I) is defined as ECG with ST-elevation without QRS distortion.

Methods: In a substudy of the international, multicenter, prospective, randomized Trial of Routine Aspiration Thrombectomy with PCI versus PCI Alone in Patients with STEMI (TOTAL), we studied the prognostic impact of the grade of ischemia classification on the outcome in patients with STEMI (n=7,211). The primary outcome was a composite of death from cardiovascular causes, recurrent MI, cardiogenic shock, or New York Heart Association (NYHA) class IV heart failure within one year.

Results: The primary outcome occurred in 153 of 1,563 patients (9.8%) in the G3I group vs. 364 of 5,648 patients (6.4%) in the G2I group (hazard ratio [HR], 1.55; 95% confidence interval [CI], 1.29 to 1.88; p<0.001). The rates of cardiovascular death (4.8% with G3I vs. 2.5% with G2I; HR, 1.92; 95% CI, 1.45 to 2.54; p<0.001) and all-cause mortality (5.2% with G3I vs. 3.3% with G2I; HR, 1.62; 95% CI, 1.25 to 2.10; p<0.001) were also higher in patients with G3I. The rate of stroke or TIA were similar within the two groups (1.1% with G3I vs. 1.0% with G2I; HR, 1.13; 95% CI, 0.66 to 1.95; p=0.650). The grade of ischemia (G3I vs G2I) was shown to be an independent predictor of primary outcome in adjusted multivariable analysis (adjusted HR, 1.43; 95% CI, 1.18 to 1.74; p<0.001).

Conclusions: STEMI patients with G3I in the presenting ECG proved to have an increased rate of cardiovascular death, recurrent MI, cardiogenic shock, or NYHA class IV heart failure within one year compared to patients with G2I.