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Alteplase was more efficient than streptokinase, reteplase and tenecteplase in elevated-ST-segment acute myocardial infarction treatment

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Background: Elevated ST-segment acute myocardial infarction (STEMI) is due to a complete and maintained thrombotic coronary occlusion (1) with first 28 days mortality incidence of 5.6% (2). STEMI treatment has improved mainly due to reperfusion therapies.

Aims: To compare the efficacy and safety of the compounds streptokinase, alteplase, reteplase and tenecteplase in patients with ST-segment elevated acute myocardial infarction.

Methods: A prospective, observational, controlled study in patients with STEMI consecutive admitted to the coronary care unit study since 2007 until 2011 was done. Clinical stage, risk factors existence, TIMI and Killip score, ECG evaluation, improve of left ventricular ejection fraction, treatments, prognosis, treatment-related adverse reactions (major and minor bleeding, hypotension) and mortality rate were recorded. Primary endpoints were death from all causes, ST-segment resolution, pain disappearance, and adverse reaction rate. Results were analyzed by Student t test, ANOVA test followed by Bonferroni post-test, and Chi-square test stratified by treatment.

Results: 920 patients with STEMI (aged 63.6 ± 0.36 years old, male 76%, initial diagnostic of acute myocardial infarction 89.7%, risk factor rate 61.2%: hypertensives (33.7%), smokers (26.3%), dyslipidemics (22.6%) diabetics (18.7%), Killip-1 54.1%, TIMI>4 53,3%) were studied. Patients were treated with streptokinase 25%, tenecteplase (47%), alteplase (26%) or reteplase (3%). Fibrinolytics standard doses in 91.4% of patients. First medical contact to reperfusion time were streptokinase 313 ± 72 min, alteplase 427 ± 116, tenecteplase 380 ± 91 and reteplase 230 ± 110 min. Alteplase significantly ($P<0.05$) improved the primary end points: 1) ST-segment resolution >70% after first hour/final follow-up: alteplase 42.1%/60.8% >tenecteplase 33.4%/52.3% >streptokinase 23%/37.1% >reteplase 9.1%/22.2%; 2) myoglobin levels reduction: streptokinase 51.7% =tenecteplase 51.1% =alteplase 50.9 >reteplase 27.3%; 3) pain cessation: streptokinase 19.1% =tenecteplase 18.1% =alteplase 18% >reteplase 9.1%; 4) major bleeding: tenecteplase 1.6% <alteplase 2.2% <streptokinase 3.9% >reteplase 4.5%; 5) reocclusion: streptokinase 5.7% <alteplase 6.1% <reteplase 13.6% <tenecteplase 19.5%; 6) mortality rate: alteplase 5.7% <tenecteplase 6.8% <reteplase (rt-PA db) 9.1% <streptokinase 21.3%. There were no treatment-related differences in the left ventricular ejection fraction improvement.

Conclusion: Alteplase was more efficient than streptokinase, reteplase and tenecteplase in elevated-ST-segment acute myocardial infarction treatment.

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