The incidence, time distribution and prognostic value of monomorphic ventricular tachycardia in ST-elevation myocardial infarction: the prespecified analysis of VALIDATE SWEADHEART trial

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Background: The assessment of prognostic impact of ventricular arrhythmias in ST-elevation myocardial infarction (STEMI) is currently based mainly on their timing with regard to the symptom onset and does not distinguish between monomorphic ventricular tachycardia (VT) and polymorphic VT/ventricular fibrillation (VF). However, recent data indicate long-term hazard of monomorphic VT occurring early in the course of STEMI.

Purpose: To evaluate the incidence, time distribution and prognostic value of early monomorphic VT compared to polymorphic VT/VF in STEMI patients treated by primary percutaneous coronary interventions (PCI).

Methods: A prespecified analysis of the multicentre prospective registry-based randomised VALIDATE-SWEDEHEART trial included STEMI patients enrolled at 16 sites in Sweden between June 2014 and September 2016. Source data verification regarding the type and timing of arrhythmia from all patients with VT/VF during STEMI was performed. Survival status was obtained from the Swedish national population registry. Endpoint was total mortality at 180 days.

Results: In total, 2886 patients were identified. Among them, 97 (3.4%) had VF or polymorphic VT, 16 (0.5%) monomorphic VT, 6 (0.2%) had other undefined shockable rhythm. Total mortality (10.9% vs 2.8%, p≤0.001) was higher among patients with VT/VF. VT/VF was associated with total mortality (HR 3.18 95% CI 1.74–5.8; p≤0.001) after adjustment on age, gender and myocardial infarction localisation. In patients discharged from hospital, VT/VF did not influence the long-term prognosis.

Patients with monomorphic VT had similar clinical characteristics as compared to those with polymorphic VT/VF. The time distribution of VT/VF differed with regard to the type of arrhythmia: 63% of monomorphic VT/VF episodes occurred after PCI (n=10) compared to 24% (n=23) of all documented polymorphic VT/VF, p=0.003. Total mortality (12.5% vs 10.3%, p=0.678) did not differ between patients with monomorphic VT and polymorphic VT/VF. In Cox model, total mortality was not associated with the type of arrhythmia (Figure).

Conclusion: Early VT/VF is a marker of poor short-term outcome in patients with STEMI, which does not affect long-term prognosis in those who are successfully resuscitated and discharged from hospital.

The incidence of monomorphic VT in STEMI treated by primary PCI is low, and it occurs mainly after PCI. Though no significant difference in mortality was found between patients with monomorphic VT and polymorphic VT/VF, the observed low incidence hampers drawing conclusions with regard to the prognostic hazard impact of monomorphic VT.