Telemedicine in the pre-hospital evaluation of patients with acute myocardial infarction

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ABSTRACT

The PhD dissertation originates from the Department of Cardiology B, Skejby University hospital, Denmark. With the main purpose of reducing the treatment delay in patients with ST-elevation myocardial infarction (STEMI), a strategy of pre-hospital evaluation with the use of telemedicine was introduced in 1999 in the County of Århus, Denmark. The dissertation had the following purposes: 1) to delineate epidemiological aspects of STEMI, 2) to evaluate whether it was technically feasible to establish pre-hospital diagnoses with the use of telemedicine, and 3) to estimate the impact of prehospital diagnosis on treatment delay in patients treated with thrombolysis or primary percutanous coronary intervention (primary PCI). The thesis consists of five papers.

Based on a review of the literature it is hypothesized that the benefit of earlier initiation of reperfusion therapy in patients with STEMI has previously been underestimated. Based on a cohort study it is estimated that approximately 40% of patients with AMI are categorised as having STEMI, and the majority of these patients are found eligible for prehospital evaluation. A prospective study was performed to evaluate the technical feasibility of telemedicine in the prehospital evaluation of patients with acute myocardial infarction (AMI). It was found that 98% of ECGs transmitted from ambulance to the telemedicine centre was evaluated useful for diagnostic purposes. In 86% of the cases, the pre-hospital evaluation with the use of telemedicine was found successful. A prospective study was performed to evaluate the impact of pre-hospital diagnosis on treatment delay in patients treated with primary PCI. During a 15-month period, all patients living in the catchments area of two local hospitals and transferred to a remote interventional centre for primary PCI were identified. Patients diagnosed pre-hospitally and referred directly to the interventional centre, bypassing the local hospitals, were treated 81 minutes earlier than patients not diagnosed pre-hospitally.

Perspectives: In the era of primary PCI a reappraisal of prehospital diagnosis may result in a significant reduction in treatment delay, especially if pre-hospital diagnosis is combined with referral directly to interventional centres. In regions where ambulances are not staffed with physicians or paramedics, use of telemedicine may be considered for the pre-hospital evaluation of patients with STEMI.