Reducing System Delay to Definitive Care For STEMI Patients, a Simulation of Two Different Strategies in the Brugge Area, Belgium

Authors : E. Steen, B. Dewulf, N. Müller, C. Vandycke, Y. Vandekerckhove

Abstract : Introduction: The care for a ST-elevation myocardial infarction (STEMI) patient is time-critical. Reperfusion therapy within 90 minutes of initial medical contact is mandatory in the improvement of the outcome. Primary percutaneous coronary intervention (PCI) without previous fibrinolytic treatment, is the preferred reperfusion strategy in patients with STEMI, provided it can be performed within guideline-mandated times. Aim of the study: During a one year period (January 2013 to December 2013) the files of all consecutive STEMI patients with urgent referral from non-PCI facilities for primary PCI were reviewed. Special attention was given to a subgroup of patients with prior out-of-hospital medical contact generated by the 112-system. In an effort to reduce out-of-hospital system delay to definitive care a change in pre-hospital 112 dispatch strategies is proposed for these time-critical patients. Actual time recordings were compared with travel time simulations for two suggested scenarios. A first scenario (SC1) involves the decision by the on scene ground EMS (GEMS) team to transport the out-of-hospital diagnosed STEMI patient straight forward to a PCI centre bypassing the nearest non-PCI hospital. Another strategy (SC2) explored the potential role of helicopter EMS (HEMS) where the on scene GEMS team requests a PCI-centre based HEMS team for immediate medical transfer to the PCI centre. Methods and Results: 49 (29,1% of all) STEMI patients were referred to our hospital for emergency PCI by a non-PCI facility. 1 file was excluded because of insufficient data collection. Within this analysed group of 48 secondary referrals 21 patients had an out-of-hospital medical contact generated by the 112-system. The other 27 patients presented at the referring emergency department without prior contact with the 112-system. The table below shows the actual time data from first medical contact to definitive care as well as the simulated possible gain of time for both suggested strategies. The PCI-team was always alarmed upon departure from the referring centre excluding further in-hospital delay. Time simulation tools were similar to those used by the 112-dispatch centre. Conclusion: Our data analysis confirms prolonged reperfusion times in case of secondary emergency referrals for STEMI patients even with the use of HEMS. In our setting there was no statistical difference in gain of time between the two suggested strategies, both reducing the secondary referral generated delay with about one hour and by this offering all patients PCI within the guidelines mandated time. However, immediate HEMS activation by the on scene ground EMS team for transport purposes is preferred. This ensures a faster availability of the local GEMS-team for its community. In case these options are not available and the guideline-mandated times for primary PCI are expected to be exceeded, primary fibrinolysis should be considered in a non-PCI centre.