

Risk assessment after acute myocardial infarction

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Valorisation

In The Netherlands, coronary artery disease (CAD) in 2012 was responsible for more than 80,000 annual hospital admissions of more than 24 hours. As a consequence, CAD is accompanied by relatively high costs (2.3% of the total Dutch healthcare costs in 2011), largely contributed to hospital care. In addition, 35% of admissions are the result of acute myocardial infarction (AMI). Although length of hospital stay declined by approximately 40% between 1995 and 2010, mean hospital stay for AMI in 2012 was 5 days in men and 6 days in women. Furthermore, it is estimated that the number of patients affected by CAD will increase from 610,000 to 840,000 between 2011 and 2030 as a result of aging and demographic growth.¹

As a consequence, AMI makes that our society faces a serious healthcare issue today as well as for the future. At present, Dutch AMI patient care has been regulated very properly. STEMI patients are supposed to be transferred as soon as possible to the nearest PCI center, whereas in NSTEMI patients, particular importance is attached to risk-based decision making. This established approach has become the norm for AMI treatment. As a consequence Dutch hospitals have to provide statistics about the percentage of patients undergoing PPCI or risk-based revascularization in order to meet quality requirements. Although this policy quite rightly focuses attention on high-risk patients, lower-risk patients often go unnoticed.

In this thesis, we demonstrated that the Zwolle Risk Score (ZRS) was able to identify PPCI patients who were eligible candidates for next day discharge when protocolized outpatient care was provided. Compared to controls, short-stay patients had similar outcomes, but their stay in hospital was significantly shorter. Furthermore, it was demonstrated that ZRS and NT-proBNP measured between 18–24 h after PPCI had comparable predictive accuracy for 30-day mortality. However, combined use considerably improved discrimination of low- and higher-risk patients and could provide decision rules to target the largest patient groups (up to 75% of the study population) who would be eligible for discharge 48 h after admission, with very low occurrence of adverse events and readmissions. Finally, NT-proBNP and the GRACE risk score also demonstrated comparable, good predictive value in NSTEMI patients.

Although mortality risk and hospital early discharge are closely related, many other circumstances have to be taken into account. In this thesis we also demonstrated that

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NT-proBNP has predictive value for the occurrence of both ischemic and bleeding events. In addition, NT-proBNP and high-sensitivity troponin T (hs-TnT) may serve as biomarker for prediction and prognostication of new onset atrial fibrillation in PPCI patients.

In conclusion, this thesis established the value of NT-proBNP over and beyond current risk strategies. Despite the fact that at present low-risk AMI patients have an excellent prognosis, several standard procedures such as a stay in hospital of several days, driving disqualification for 4 weeks, initiation of rehabilitation several weeks after discharge and annual outpatient department visits are applied to many patients by protocol. Although prospective validation of our findings will have to be performed, the presented research enables the development of more accurate risk strategies in order to optimize patient management and to control healthcare expenses.

¹Data derived from <https://www.volksgezondheidzorg.info>, official website of the Dutch Ministry of Health, Welfare and Sport.