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PATIENTS WITH ACUTE CORONARY SYNDROME AND STROKE THROUGHOUT THE ACUTE HEALTHCARE CHAIN

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Background: For patients with acute coronary syndrome (ACS) and stroke prompt diagnosis and treatment is essential. In most cases of myocardial infarction blood flow needs to be restored through percutaneous coronary intervention (PCI) or through thrombolytic medications. Treatments are most effective if started as early as possible. For patients with ST-elevated MI (STEMI) PCI should be started within 90 minutes. For ischemic stroke patients thrombolysis with recombinant tissue plasminogen activator (rt-PA) needs to be given within 4.5 hours after onset of symptoms. Before a patient reaches a PCI center or stroke unit he may have had contact with a general practitioner (GP), a GP cooperative (GPC), ambulance service, or Emergency Department (ED), and probably with more than one acute health care provider. It is of utmost importance that patients with ACS and stroke are diagnosed as early as possible and promptly reach the right health care provider for optimal treatment. Therefore, optimal use and efficient functioning of the acute health care chain is imperative. To identify possible delays and bottlenecks, insight into the overall acute care chain is necessary.

Aim: The aim of this study is to obtain insight into 1) circumstances in which symptoms of patients occur, 2) medical contacts throughout the acute care chain, 3) delays stratified by health care providers, and 4) door-to-balloon time for patients with STEMI and door-to-needle time for patients with ischemic stroke.

Methods: The MICK study is a prospective observational study including 202 patients suspected of having ACS (mean age 63.3 y, 65.8% men) and 239 suspected of ischemic stroke (69.9 y, 49.8% men). Patients were hospitalized in one of three coronary care units (CCU) or in one of four stroke units in the region of Twente and Oost-Achterhoek (Euregio), the Netherlands, over a period of 18 weeks. Patients filled out a questionnaire and additional data was obtained using registries.

Results: 75% Of all patients was at home when symptoms occurred and 50% had their own partner present. Over 40% of all patients suspected of ACS waited more than 6 hours before contacting a health care provider and over 30% of all patients suspected of having a stroke waited more than 4 hours. Patients with more severe symptoms sought medical contact earlier. Once a care provider was contacted, 45% of all patients with ACS were hospitalized within 90 minutes at the CCU and 65% of patients with stroke within 4 hours at the stroke unit. Over 80% of ACS patients first contacted the GP or GPC, compared with 72% of stroke patients. After contact with the GP, about half of the patients were transported by ambulance, whereas after contact with the GPC 80% of ACS patients and 64% of stroke patients were transported by ambulance. Patients reached the hospital through many different health care chains. ACS patients reached the CCU via 'GPC-ambulance' (25%), 'GP-ambulance' (24%), and various other routes (51%). Stroke patients reached the stroke unit via 'ambulance-ED' (24%), 'GP-ED' (23%), 'GP-ambulance-ED' (23%) and 'GPC-ambulance-ED' (14%). For patients who immediately called

112, the emergency number, time to hospitalization was shorter than for patients who first contacted a GP or GPC. Of ACS patients 87% reached the CCU within 90 minutes when the only contact was with an ambulance, compared to 'GPC-ambulance' (57%) and 'GP-ambulance' (40%). Similar results were found for patients with stroke; of the 'Ambulance-ED' chain 77% reached stroke unit within 4 hours, compared to 'GP-ambulance-ED' (50%), 'GPC-ambulance-ED' (48%) and 'GP-ED' (15%). Median door-to-balloon time of the 30 patients with STEMI (out of 202 suspected ACS) who underwent a PCI was 50 min. Only one patient had a PCI within 90 min after first medical contact. Median door-to-needle time of the 31 patients (out of the 182 patients with ischemic stroke) who received thrombolysis was 43 min. Most thrombolysis (93%) took place within 4 h after the first medical contact.

Conclusion: Noticeable are the long patient delays in seeking care, the various chains through which patients reach the CCU or stroke unit and the different throughput times. Calling 112 and transport by ambulance is the fastest track. Circumstances and characteristics such as type and seriousness of symptoms, may explain why most patients first contact a GP or GPC. This may explain why it takes longer for these patients to reach the CCU or stroke unit.