Variation in Organization of Transient Ischemic Attack Care in The Netherlands. A Nationwide Survey Study

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Background: Previous research has shown the importance of urgent initiation of antiplatelet therapy after transient ischemic attack (TIA) to reduce the risk of stroke. Many hospitals in the Netherlands have therefore implemented rapid pathways for assessment of patients with TIA. Dutch stroke guidelines lack clear directives for organization of TIA assessment and thus allow for variation.The aim of this study was to investigate variation in organization of TIA assessment in Dutch hospitals. *Methods:* One neurologist per hospital (of 88 Dutch hospitals) with special interest in stroke was invited to participate in a web-based survey addressing the organization, content, and timing of TIA assessment. *Results:* Seventy (80%) neurologists completed the survey, all of whom reported performing TIA assessment in their hospital. There was considerable variation in the method of application and the location of assessment. In 10% of the hospitals, patients with TIA are always admitted to the ward. The content of diagnostics is fairly similar, but hospitals vary in the extent of cardiological workup. Almost all hospitals aim for a swift start of assessment as directed by guidelines, but access time differs. Eighty-six percent of respondents reported that antiplatelet therapy is usually initiated before assessment, based on history. *Conclusions:* This study showed variation in organization of TIA assessment in Dutch hospitals, especially regarding location within the hospital, time to assessment after announcement, and cardiological workup. Further research is needed to investigate implications of this variation for quality of care. **Key Words:** TIA—transient ischemic attack—stroke—organization—secondary prevention.
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Background

Strokes form a large health issue.[1] Although symptoms of a transient ischemic attack (TIA) by definition resolve completely, they are a sign of vascular disease and an important risk factor for subsequent stroke.[2] Risk of recurrent stroke is estimated to be up to 8% within the first week after a TIA.[3,4] Previous research has emphasized the medical urgency to diagnose TIA, address relevant cardiovascular risk factors, and start treatment to reduce the risk of stroke and other vascular events. This reduces the risk of subsequent stroke by up to 80%.[5,6] To meet this urgency, many hospitals in the Netherlands have implemented rapid screening pathways for patients with TIA, hereafter called TIA assessment. Guidelines strongly advise such care but lack clear directives for the organization and logistics, for instance, regarding location and timing of care and the need for clinical admittance.[7,8] Previous survey research has shown considerable variation in the organization of acute stroke care in Dutch hospitals.[9] It was hypothesized that TIA assessment is also subject to

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organizational variation in different medical centers throughout the country. This survey study explores the current situation and potential differences regarding organization of rapid TIA care in Dutch hospitals.

Method

We conducted a web-based survey consisting of a minimum of 25 and a maximum of 39 questions, depending on the given answers, regarding institution's policies on organization, content, and timing of TIA assessment. The topics and questions were formed based on previously reported indistinctness in guidelines and difficulties in clinical practice as experienced by 2 of the authors (F.d.B., M.C.V.). One neurologist with special interest in stroke from every hospital in the Netherlands with an emergency care service for stroke was invited to participate. Three hospitals were excluded because of lack of contact information of a neurologist. Most neurologists had participated in an earlier survey about clinical practice variation in intravenous thrombolysis.[9] Regular reminders were sent from June 2014 to January 2015. No general practitioners were included. Dutch guidelines for general practitioners advise to consult a neurologist as soon as possible, preferably within 1 day, in case of a patient with a suspected TIA.

Results

Eighty-eight surveys were sent. A total of 70 (80%) neurologists completed the survey, all of whom reported performing TIA assessment in their hospital, most (87%) for more than 5 years. Seven (10%) of these hospitals were academic medical centers, all the others are general hospitals. Of the nonresponding hospitals, 1 was an academic center.

Organization

Twenty-seven (39%) respondents stated that the location of TIA assessment in their hospital varies. In the other centers, there is a set location. Table 1 lists the different locations to provide TIA assessment. Six respondents added that the location depends on how recently the TIA took place and on the patient's cardiovascular risk profile. This also appears to be of importance when deciding whether to clinically admit patients after a TIA. In 5 (7.1%) hospitals, all patients with TIA are admitted to the neurology ward to stay for a natural day. In most hospitals, this happens only by exception, with 81% of the respondents stating that they admit less than half of the patients with TIA to the clinical ward. Stated indications for clinical admittance are shown in Table 2. Although almost all hospitals (99%) are able to perform TIA assessment during every weekday, only a minority of hospitals (13%) provide the complete assessment outside of office hours. In most of the other hospitals (73%), carotid ultrasound imaging not being available outside of office hours is the bottleneck. Most hospitals (74%) conduct as many elements of the TIA assessment as possible shortly after announcement (e.g., blood, computed tomography, electrocardiogram [ECG]).

Table 1. *Locations for TIA screening*

Stated location	N (%)
Short stay ward	32 (46)
Clinical ward*	28 (40)
Outpatient clinic	22 (31)
Emergency department	18 (26)

Abbreviation: TIA, transient ischemic attack.
*Including stroke or brain care unit. Multiple answers possible.

Table 2. *Indications for clinical admittance (multiple answers possible)*

Stated indication for admittance	N (%)
High ABCD2 score or cardiovascular risk profile	39 (56)
Multiple TIA in short amount of time	58 (83)
Presentation outside of office hours	27 (39)
Significant carotid stenosis	12 (17)
Timely access to additional examination	25 (36)
Timely access to intravenous thrombolysis	11 (16)
Access to heart rhythm monitoring	30 (43)

Abbreviation: TIA, transient ischemic attack.

Content

Table 3 shows the content of standard TIA assessment as stated by the respondents. Most aspects of the assessment are very similar between the hospitals, but there is variation in the extent of cardiological workup. In all hospitals, a regular ECG is done, and in a smaller number of hospitals, patients are subject to Holter monitoring and assessment by a cardiologist. Relatively young patients with TIA are subject to more extensive investigations in all of

Table 3. *Content of TIA assessment*

Item of TIA assessment	N (%)
Brain imaging	70 (100)
Regular ECG	70 (100)
History taking and neurological examination	69 (99)
Laboratory testing	69 (99)
Carotid ultrasound	66 (94)
Prolonged Holter ECG	14 (20)
Referral to cardiologist for extensive assessment	11 (16)
Chest X-ray	6 (9)

Abbreviations: ECG, electrocardiogram; TIA, transient ischemic attack.

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