

Stroke Note

Variation in Clinical Practice of Intravenous Thrombolysis in Stroke in the Netherlands

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Key Words

Acute stroke · Thrombolysis · Quality of care

Abstract

In the Netherlands in 2010, 11% of patients with ischemic stroke received intravenous thrombolysis (IVT), varying from 4 to 26% between hospitals. The aim of this study was to investigate variation in clinical practice and organization of IVT in relationship to performance and outcome. In all 84 Dutch hospitals performing IVT, a stroke neurologist was approached using a web-based survey. The response rate was 82%. The study showed considerable variation. For example, door-to-needle time ranged from 25 to 80 min. High blood pressure was actively lowered before performing IVT by 57% of neurologists, while 35% chose to wait. 28% started IVT without knowledge of laboratory results. Better follow-up data are needed to see whether this variation results in differences in outcome.

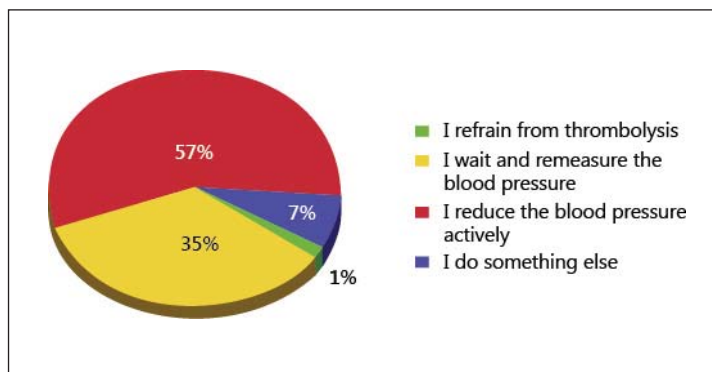
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Introduction

In the Netherlands in 2010, 11% of the patients with ischemic stroke received intravenous thrombolysis (IVT), varying from 4 to 26% between individual hospitals [1]. This variation is not explained by late arrival due to distance [2]. The present Dutch stroke guidelines [3] allow for variation in the indication of thrombolysis, such as management of high blood pressure. The aim of this study was to investigate variation in clinical practice and organization of IVT in relationship to performance and outcome.

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Fig. 1. Treatment strategies of the neurologists in the following situation: you consider treating a patient with thrombolysis; however, the blood pressure is too high (SBP >185 mm Hg or DBP >110 mm Hg).



Methods

In all 84 Dutch hospitals which performed IVT in 2010, a stroke neurologist was asked to participate in a web-based survey (<http://www.enqueteviainternet.nl>). The topics addressed were average door-to-needle time (DTNT), yearly number of IVT and intra-arterial thrombolyses, and outcome (Modified Rankin Scale after 3 months). Using the clinical directives from the present Dutch stroke guidelines [3], we identified situations where variation could be expected.

We studied associations between variation in treatment and effect on DTNT, percentage of thrombolysis within the hour, percentage of patients receiving IVT treatment (linear regression analysis, SPSS), and the effect of patient volume.

Results

69 stroke neurologists responded (82%). The yearly number of ischemic strokes treated in their hospitals ranged from 80 to 800 and the proportion receiving thrombolysis ranged from 5 to 36%. The average DTNT was 25–80 min (median 25–61).

High blood pressure was actively lowered by 57% of neurologists, whereas 35% waited for the blood pressure to drop spontaneously (fig. 1). 28% of neurologists started IVT without knowledge of the laboratory results, while 58% awaited at least the glucose results. Thrombocyte count was awaited by 23% of neurologists, before performing IVT, and international normalized ratio was awaited by 33% of neurologists.

In case of rapid but not complete recovery, 83% of neurologists did not refrain from using IVT. 36% of neurologists treated patients, who after complete recovery experienced a relapse, within 4.5 h after the first symptoms. 48% of neurologists considered the new symptoms as a new episode and treated them irrespective of the time which had elapsed since the first symptoms. 10% of neurologists did not withhold IVT in case of depressed consciousness. High age was a contraindication for 8% of neurologists. Use of oral anticoagulants with a normal international normalized ratio meant a contraindication for only 5% of neurologists.

No relationship between the number of IVT patients and DTNT ($p > 0.05$) was shown. In 31 centers (45%) information on the 3-month patient status was available, while in 35% of them this was assessed by means of the Modified Rankin Scale.

Discussion

We found considerable variation in clinical practice of IVT in the Netherlands, appearing from differences in the proportion of IVT treatment and in the management of clinical situations. This variation is likely to affect the number of patients eligible for IVT and may have an effect on clinical outcome. The influence and presence of this variation have been noted in other studies [4–6]. IST-3 shows that aged patients (>80) benefit from thrombolysis compared to placebo [7].

In our study a lack of follow-up data precluded analysis of the effect on performance and outcome. Self-reporting may have introduced bias. Participating stroke neurologists were not necessarily representative for the local policy. A systematic collection of follow-up data is needed to increase the knowledge on the effectiveness of IVT in diverse clinical situations [8].

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