

EDITORIAL

Local Versus Specialized Treatment

The Difficulty in Interpreting Regional Variations in Treatment

Klaus Berger

Editorial accompanying the article “Regional Differences in Acute Stroke Admission and Thrombolysis Rates in the German Federal State of Hesse” by Erwin Stolz, Gerhard F. Hamann, Manfred Kaps, and Björn Misselwitz in this issue of *Deutsches Ärzteblatt International*

On the next pages of this issue of the *Deutsches Ärzteblatt International* there appear various contributions on the topic of stroke. Kessler and co-authors report on how “Standardized Pre-hospital Management of Stroke” might look (1). Diederichs and co-authors present data from the Dortmund and Münster Stroke Register and put “Predictors of Dependency on Nursing Care After Stroke” under the microscope (2). Knecht and co-authors describe measures for “Rehabilitation After Stroke” (3). Because of its particular political explosiveness, I am going to consider the fourth contribution, by Stolz and colleagues, on “Regional Differences in Acute Stroke Admission and Thrombolysis Rates in the German Federal State of Hesse” (4).

Admissions for thrombolysis after cerebral infarction

The licensing of intravenous thrombolysis using tissue plasminogen activator (t-PA) some 10 years ago was accompanied by a lively discussion of the risks and usefulness of this therapy. The introduction of specialist stroke units, which had already begun, was inseparable from the licensing of lytic therapy, as these units were regarded as the essential infrastructure needed for this treatment to be carried out. Since then, thrombolytic treatment has long become clinical routine for patients with cerebral infarction, and stroke units have been established throughout Germany, with very few gaps in provision.

In their article, Stolz and colleagues highlight regional differences in the use of thrombolysis in patients with acute cerebral infarction in the federal state of Hesse (4). The analysis they present is based on data from the quality assurance program for stroke treatment, which has been introduced throughout Hesse as it has in other areas of Germany. Using these quality assurance data has the great advantage that these data stem from routine clinical care and in principle include every hospital in Hesse.

Stolz and co-authors made some decisions at the outset that need to be borne in mind when reading their article. One of these was the decision to analyze the data on the basis of the district in which the patient lived, not on the basis of the district where the treatment was carried out. Taking this perspective, some results were produced that might have been expected; others were surprising. It is to be expected that a higher percentage of patients in a district will be

treated in a stroke unit if there is a stroke unit in one or more of the hospitals in that district. By the same token, if there is no stroke unit, the percentage of those who are treated in one will be much lower. An example of this can be seen in the two north-eastern and north-western districts of Hesse. On the other hand, the absence of a stroke unit in a district does not automatically result in smaller case numbers: the southern and south-western districts of Hesse, which also do not have a stroke unit, still attain treatment rates of 66% to 79% for patients who live within their boundaries.

Clearly there are organizational and structural differences between the northern and the southern districts which cause these variations. It may be that emergency service protocols and local admissions agreements are implemented in different ways. A regional emergency protocol set up especially for stroke patients is influenced by many factors. One important component is the economic interests of the hospitals. Other components, such as population density, access routes and distances, and regulatory responsibilities often make it necessary to think “across the boundary.” For the setting up of specialist units does not stop at district boundaries. This can work, as has been shown by established programs in many parts of Germany, including various parts of Hesse.

Specialist units are not always local

Setting up specialist units always means—conceptually—stepping away from the local. Strategies aimed at keeping this step small, such as setting up telemedicine alliances, are cost-intensive and so far have come into being only in isolated instances. As long as emergency protocols stop at the district boundary, while the setting up of stroke units follows population density irrespective of district boundaries, organizing and implementing the emergency services will remain a challenge as though we were still living in the small-state patchwork of the Late Middle Ages.

In their article, Stolz and co-authors highlight the large variation in rates of thrombolysis of patients with cerebral infarction who reach hospital within 3 hours and the relationship between decreasing thrombolysis rates and increasing case numbers. Their intention, which is to point out that every person living in Hesse should have the same chance of optimal treatment if they suffer an acute stroke, is honorable. However, on this point their analysis falls short.

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Chance of optimal treatment in practice

If we start from the ideal that every person living in Hesse who has a cerebral infarct were to have the same chance of receiving this treatment, would we then expect to see similar thrombolysis rates at the various stroke units or hospitals? The answer is: No, because arriving at the hospital or stroke unit is only one component of the complex set of occurrences. Individual—that is, patient-related—factors are another, important component, while department-specific organization and action protocols are a third.

Patient-related factors include age, comorbidity profile, and a list of contraindications for thrombolysis. Age and comorbidity burden are strongly correlated. In addition, in Hesse as elsewhere in Germany, there are considerable differences in age and social structure between the different parts of the state, and these are expressed in differences in the patient profiles of the hospitals.

The quality assurance data on stroke treatment offer various starting points for future research projects. One example is the percentage of patients with stroke recurrence. Data from the German Stroke Register Working Group show that approximately a quarter of all stroke patients are treated for recurrent stroke, and a good one third of those who are admitted early after experiencing a stroke have only slight symptoms. In both these groups, lytic therapy is seldom or never indicated.

This is why a short interval between the event and hospital admission does not automatically mean a higher rate of lysis. Finally, thrombolysis rates are also affected by management procedures at individual units and hospitals. Ten years after thrombolytic therapy was first introduced, procedures for the “classic case” will no doubt be relatively similar. It may be assumed, however, that with patients in whom lysis is not so straightforwardly indicated, procedures vary. Case numbers are important here, since, quite simply, the more cases you see, the more likely it becomes that you will encounter rare or atypical features or patterns of features.

Conclusion

Regional differences in treatment which at first glance appear to be obvious need to be interpreted with caution. This is as true for thrombolytic treatment for stroke as it is for many specialized treatments of other diseases. On closer inspection, the obvious differences are complex and influenced by a great many factors. Looking into the future makes the picture even more complicated. Therapies such as mechanical thrombectomy or “bridging” lysis therapy will lead to further specialization which will be even more impossible to provide close to home for everyone.

Conflict of interest statement

Professor Berger is coordinator of the Stroke Quality Assurance Program for North-West Germany and a member of the German Stroke Register Working Group (ADSR, Arbeitsgemeinschaft Deutscher Schlaganfall-Register).

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REFERENCES

1. Kessler C, Khaw AV, Nabavi DG, Glahn J, Grond M, Busse O: Standardized pre-hospital management of stroke. *Dtsch Arztebl Int* 2011; 108(36): 585–91.
2. Diederichs C, Mühlenbruch K, Lincke HO, Heuschmann PU, Ritter MA, Berger K: Predictors of dependency on nursing care after stroke: results from the Dortmund and Münster stroke registry. *Dtsch Arztebl Int* 2011; 108(36): 592–9.
3. Knecht S, Hesse S, Oster P: Rehabilitation after stroke. *Dtsch Arztebl Int* 2011; 108(36): 600–6.
4. Stolz E, Hamann GF, Kaps M, Misselwitz B: Local differences in acute stroke admission and thrombolysis rates in the German federal state of Hesse. *Dtsch Arztebl Int* 2011; 108(36): 607–11.

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