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Commentary

Integrated care in stroke survivors: When and how much?

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Ischaemic stroke is not only a severe acute illness, survivors of such an event remain at high cardiovascular risk, often due to treatable cardiovascular comorbidities [1]. Unfortunately, post stroke and TIA work-up and care often comes to a halt at discharge. Increasing economic pressure shortens in-hospital stays, reducing access to team-based specialized treatment and rehabilitation. In the transition to outpatient care, motivation and expertise in optimal post-stroke management often decrease markedly. Therefore, experts called for structured disease management programmes, which have proven to be successful in other disease entities such as diabetes, coronary artery disease, and heart failure. Disease management programmes usually comprise patient and caregivers' counselling and education to empower patients for shared decision-making and to take on an active role in the disease management process. For continuous care, repeat in-person visits or web-based applications are offered [2]. While the concept of structured, integrated care in stroke survivors sees intuitively right, it requires rigorous evaluation.

In this issue of EClinMedicine, Dr Willeit and colleagues report the primary results of a randomized trial evaluating STROKE-CARD, a disease management programme in stroke survivors [3]. Using block randomization, 2149 patients with stroke or TIA were enroled at two Austrian hospitals during the acute hospital stay (83% with stroke/17% with TIA, mean age 69 years, median National Institutes of Health Stroke Scale [NIHSS] score 3). In addition to routine care, the pragmatic intervention programme included a single multidisciplinary outpatient appointment after three months. The specialists re-evaluated stroke aetiology, which was adjusted in 43% of patients, re-assessed risk factors and cardiovascular disease risk, screened for disease complications, assessed rehabilitation demands, managed new-onset cardiovascular disease, and addressed patients' and caregivers' disease knowledge and empowerment. In addition, patients were trained to access a web-based patient portal which included patient training, risk factor monitoring and detection of post stroke complications. In order to reduce barriers to contact the hospital, patients were provided with a stroke team contact phone number. Usual care followed local routine clinical practice. This intervention reduced the hazard for cardiovascular events by almost 40% from 8.4%/year to 5.4%/year. The clinical benefit was largely due to a reduction in cardiovascular deaths and myocardial infarction, with less effect on recurrent stroke, illustrating an effect on overall cardiovascular risk.

The STROKE-CARD results are different from the recently published international Intensified Secondary Prevention Intending a Reduction of Recurrent Events in TIA and Minor Stroke Patients (INSPiRE-TMS) [4]: The intervention tested in INSPiRE-TMS, consisted of feedback and motivational interviews during eight outpatient appointments over two years. While INSPiRE-TMS resulted in a higher rate of achieving treatment targets for secondary prevention, no difference in cardiovascular events was observed. INSPiRE-TMS enroled a somewhat healthier population (only 59% patients presenting with stroke, mean age 67 years, median NIHSS score of 1). The event rate was only 4.7% in the usual care group, and 4.4% in the intervention group.

Another earlier trial also did not find a benefit of an integrated care programme in over 3500 stroke survivors in China [5]. In that programme, only statin use was increased by the intervention (SMART), while the expected increase in antithrombotic therapy was not seen. Furthermore, many patients were lost to follow-up. Of note, that trial only enroled patients seen by neurologists, thus ensuring continued specialist care in both randomized groups.

Differences in the effectiveness of integrated care programmes have been found in other disease areas: In atrial fibrillation, an initial nurse-led integrated care programme in the Netherlands conveyed remarkable reductions in cardiovascular outcomes [6] while another programme in Australia failed to demonstrate such benefits [7], and more recent comprehensive risk factor reduction programmes showed small effects on outcomes [8].

Seen in context with earlier trials, several potential explanations emerge:

1. The population enroled in STROKE-CARD had a higher cardiovascular risk than the patients randomized in INSPiRE-TMS, translating into a higher event rate during a 1-year follow-up. Hence

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there was more room for improvement and this may have contributed to the beneficial effects of the STROKE-CARD programme.
2. Better risk factor reduction may decrease over time due to partial loss of the motivational effects of the intervention group and gradually improved risk factor management in usual care. Hence, an integrated care intervention may have transient effects and accelerate initiation of risk factor control which may happen over a longer period of time in usual care. Indeed the survival curves in STROKE-CARD separate early.
3. Complex interventions will have complex effects depending on the health care system and care patterns in which they are deployed. In addition to differences in baseline risk, regional differences in usual care, care pathways, access to medical specialists, and available public health programmes may in part explain the differences in event rates in control groups.

One strength of STROKE-CARD is the use of a patient reported outcome measure (PROM), i.e., self-reported health related quality of life as a co-primary outcome. This is in line with the increasing understanding of the importance of quality of life as an important factor to evaluate the quality and value of individual treatment and overall health-care [9].

The seemingly inconsistent trial results remind us that post-stroke care is complex. The results reported by Dr Willeit and colleagues in EClinicalMedicine today demonstrate that their STROKE-CARD programme reduced outcomes in stroke survivors in Tyrol. Similar to other well-designed clinical trials, the results also open further questions, such as

- When should disease management programmes be offered, rather early than late?
- Who are the best candidates to benefit, possibly patients with high cardiovascular risk and without continued specialist care?
- How intensive should structured treatment programmes be offered and which dimensions should be comprised?

These need to be addressed in future research. In addition, better diagnosis of cardiovascular conditions through intensified atrial fibrillation screening and possibly cardiovascular imaging may improve outcomes after stroke [10]. Integration into existing health-care environments and broad, adequately funded adoption are needed, once it is clear which type of programme is most effective.

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