Five Years with Riks-Stroke. The Swedish National Registry for Quality Assessment of Acute Stroke Care

Birgitta Stegmayr, PhD; Eva-Lotta Glader, MD *

Department of Medicine, Umeå University, Umeå, Sweden.
* **For the Riks-Stroke steering committee (Kjell Asplund, Kerstin Hulter-Åsberg, Bo Norrving, Andreas Terént, Per-Olov Wester).**

BACKGROUND

Worldwide, stroke is one of the leading cause of death and disability in people above 40 years of age (1). It is crucial that all units caring for stroke patients evaluate the most effective and acceptable methods for managing stroke patients.

A national quality assessment register for acute stroke (Riks-Stroke) was set up in Sweden in 1994. The aim of Riks-Stroke is to promote a highly qualified and equal care of stroke in Sweden. The steering committee for Riks-Stroke, frames and outlines quality indicators reflecting structure, process and outcome. All hospitals in Sweden admitting patients with acute stroke were invited and all hospitals participate since 1998. Annually, each hospital receives a written report in which the local results are compared with the national data and with comments and suggestions on improvements for the care.

PATIENTS AND METHODS

This report presents data collected from 1995 to 1999. In all about 80,000 patients from 85 units in 80 hospitals (in some hospitals, patients with acute stroke were admitted to different departments; medical, geriatric or neurological) are registered in the Riks-Stroke database. All acute stroke events can be registrated, but subarachnoid hemorrhages (SAH) and transient ischemic attacks (TIA) are excluded from the annually reports so far. Annually, about 20,000 events with ischemic and hemorrhagic strokes are included. All comparisons between stroke units and general wards are age standardized.

Data collection in Riks-Stroke is kept simple to ensure maximum coverage; it includes information on the patient's gender, age, history of previous stroke, life situation prior to the current stroke and level of mobility and need of assistance in three ADL functions, namely dressing, bathing, and going to the toilet. Items related to acute care include, the time from the onset of symptoms to admission to hospital, type of department to which the patient is admitted (medical, neurological or geriatric), whether or not the unit has organized stroke care (stroke unit), the patient's level of consciousness on admission, whether or not a CT-scan was done, and, in patients who died, whether or not an autopsy was done. In addition, drug treatment during the acute phase has been added since 1998. Items registered at discharge included: the duration of the acute admission to hospital; diagnosis of the stroke subtype, the patient's status at discharge (alive or dead), details of further management (at home or in an institution) and whether or not they required further care in an institution. Each patient registered in Riks-Stroke has been followed up three months after the stroke. All patients are recorded with a unique personal number.

RESULTS

When the Riks-Stroke was introduced 1994, 63% of all stroke caring units decided to participate. Since 1998 and onwards, all hospitals are taking part (Figure 1). The case mix has not changed over the years and (Figure 2) shows that the mean age is 75 years (73 years in men and 77 in women). As many men as women have been included in the register. Seventy-five percent had a first-ever stroke and 21% percent had a lowered level of consciousness on arrival to hospital.

Figure 1

Patient characteristics on admission

	1994	1999
Mean age, y	75.1	75.0
Men/women, %	52/48	52/48
First-ever stroke, %	69.8	70.6
Living at home (indep.), %	73.6	76.3
Impaired conscious-ness when first seen, %	21.4	18.7

Figure 2

Over the years the examination by CT scan has increased, in particular in patients older than 75 years. In 1999, 97% of all patients were examined by CT scan (Figure 3). Due to the increased use of CT scan, setting of stroke diagnoses has improved and only 6% percent had an unspecified stroke diagnose 1999 (Figure 4). The 28-day case fatality (CF) has not changed over the years, and for all patients the CF is 12%. For younger patients (<75 years) the CF is around 8% and for patients 75 years and older the CF is around 16% (Figure 5). After three months 16% of all patients had died (Figure 6) with no differences between men and women.

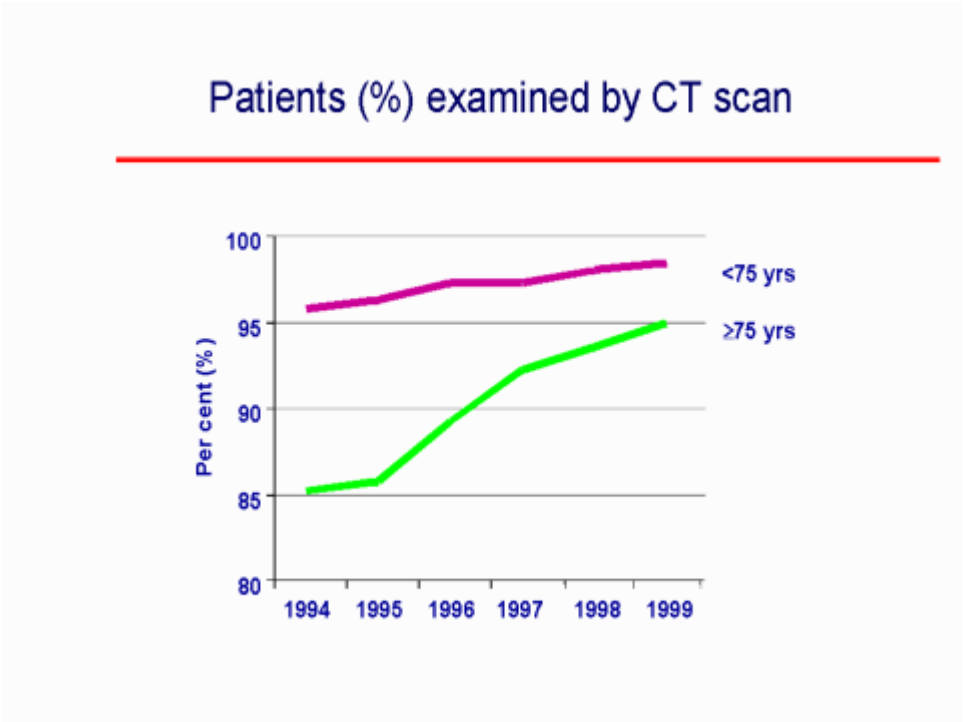

Figure 3

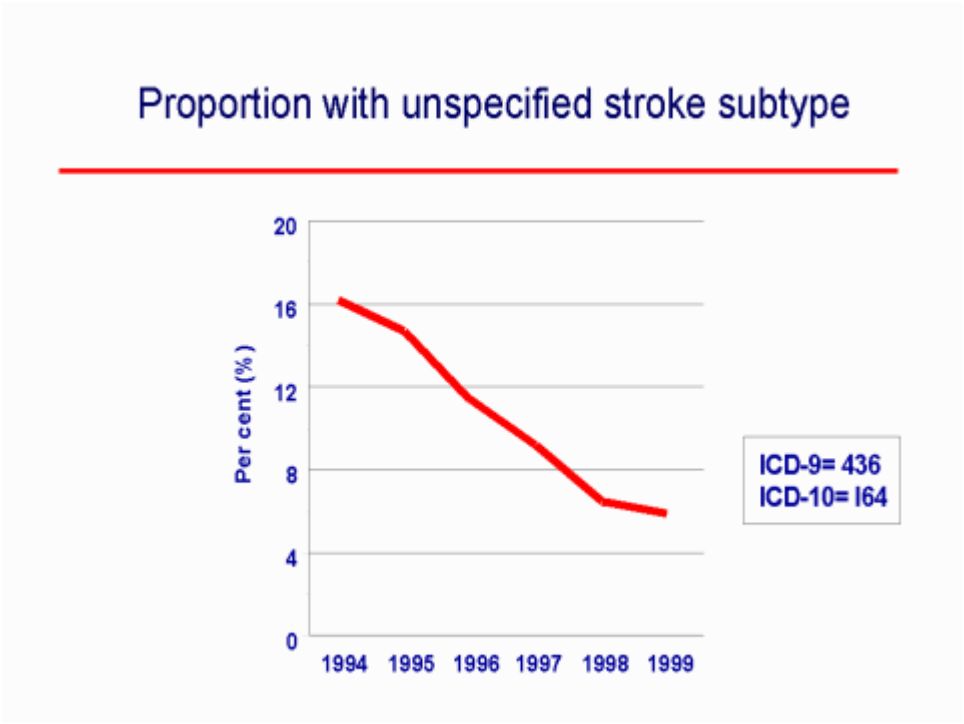

Figure 4

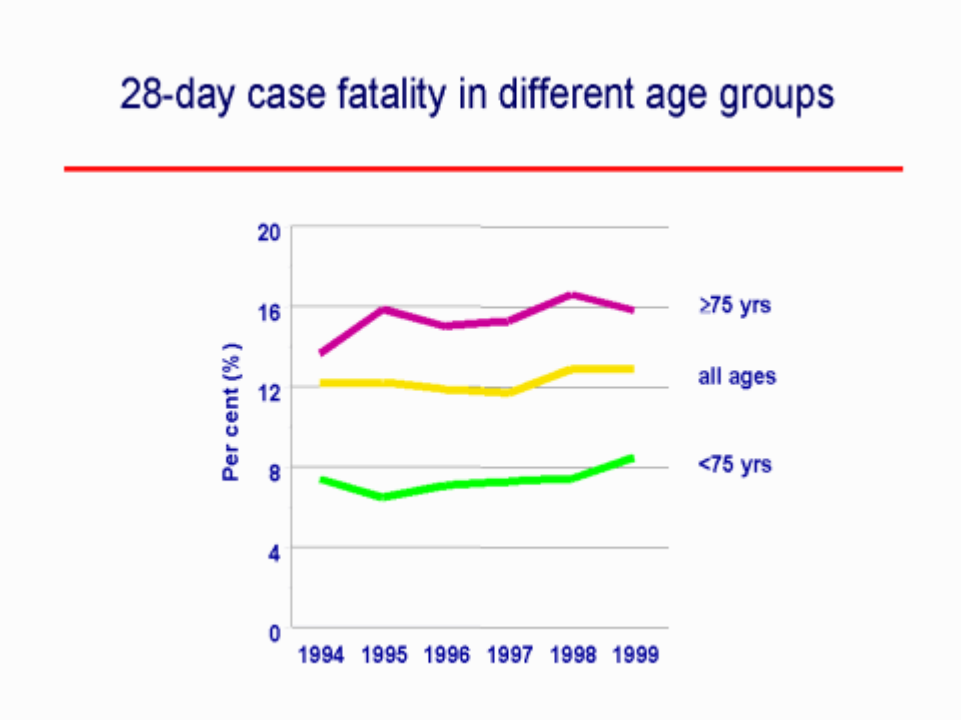

Figure 5

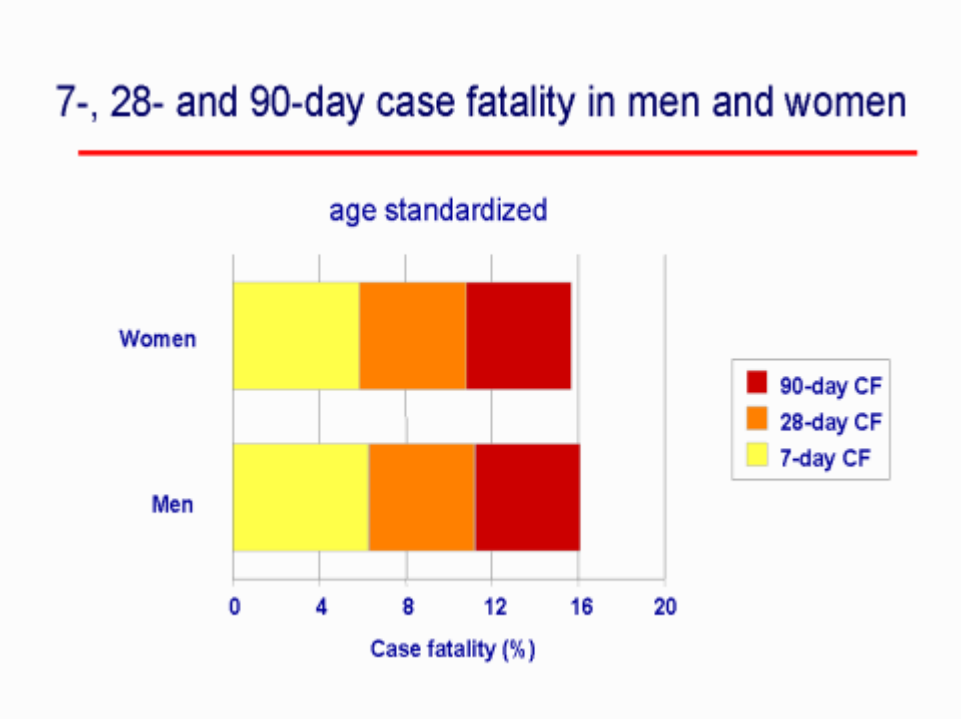

Figure 6

The treatment during the first week (or at onset) shows that 73% of all ischemic stroke patients received aspirin, and 30% other antiplatelet agents, alone or in combination with aspirin. Only 0.5% were treated by trombolytic agents (Figure 7). In patients with ischemic stroke and atrial fibrillation, 30% of all men and women were discharged with an oral anticoagulant agent, more in young patients (52%) than in old (23%) (Figure 8). However, huge variation in the use of anticoagulant agents at different hospitals, was seen (Figure 9).

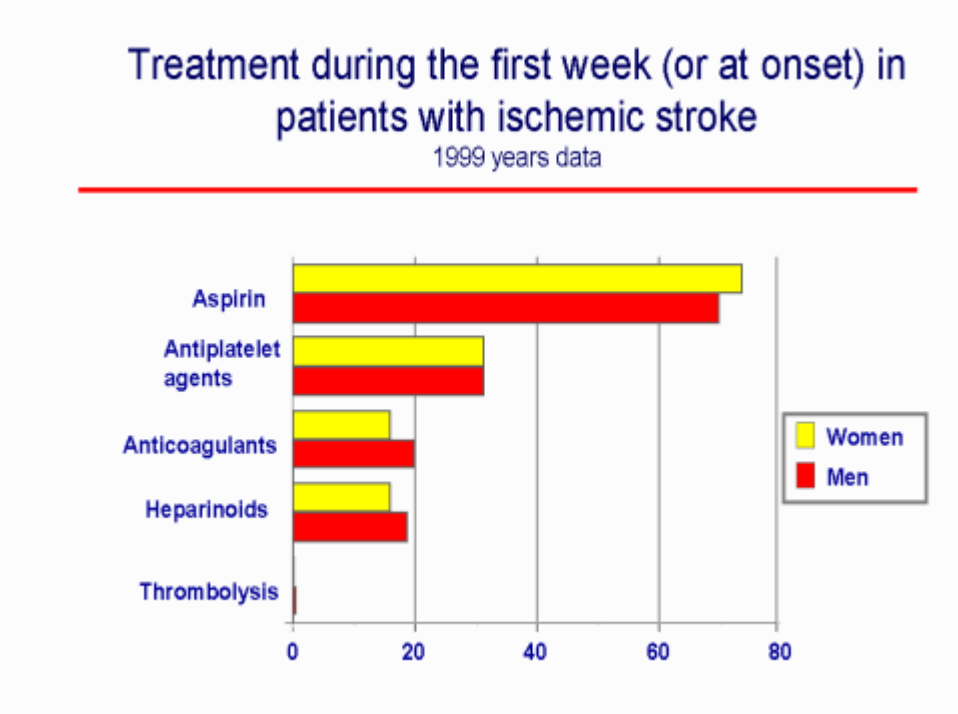

Figure 7

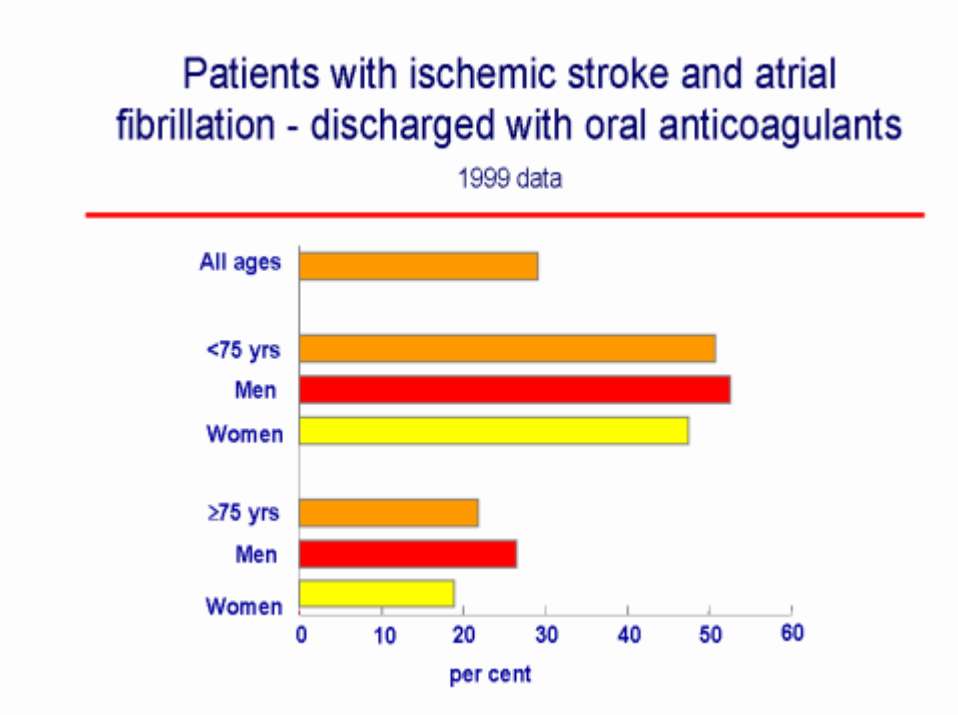

Figure 8

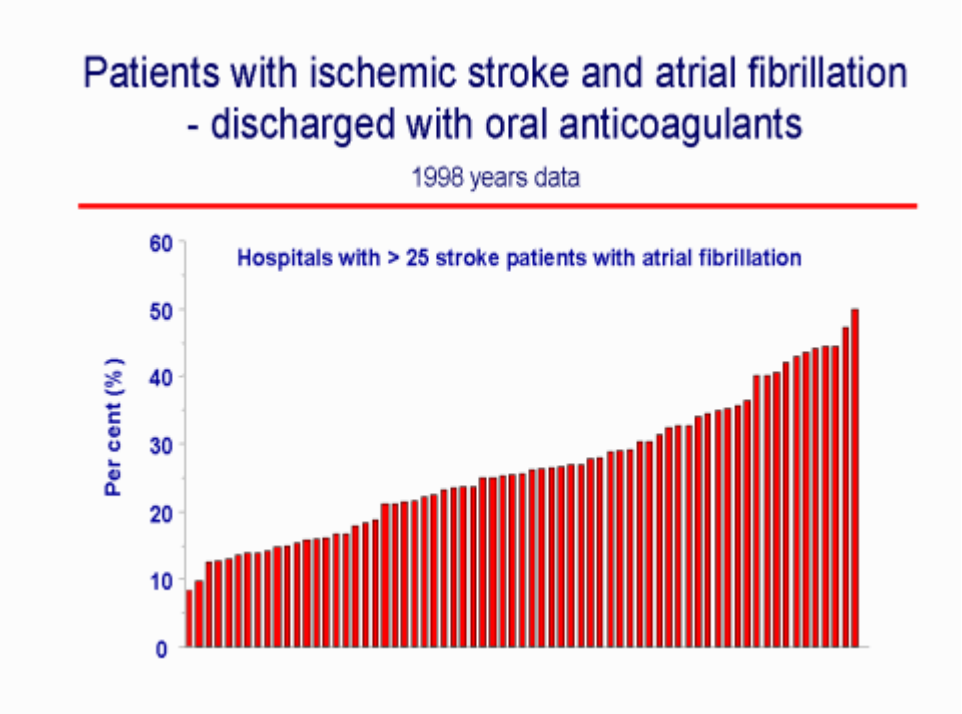

Figure 9

Figure 10 shows that the proportion dependent in primary ADL at three months after the stroke has improved over the years, from 26% in 1994 to 19% in 1999. This improvement may be related to dedicated stroke units. In 1999, 70% of the stroke patients were cared for in a stroke unit compared to about half of the patients in 1994 (Figure 11).

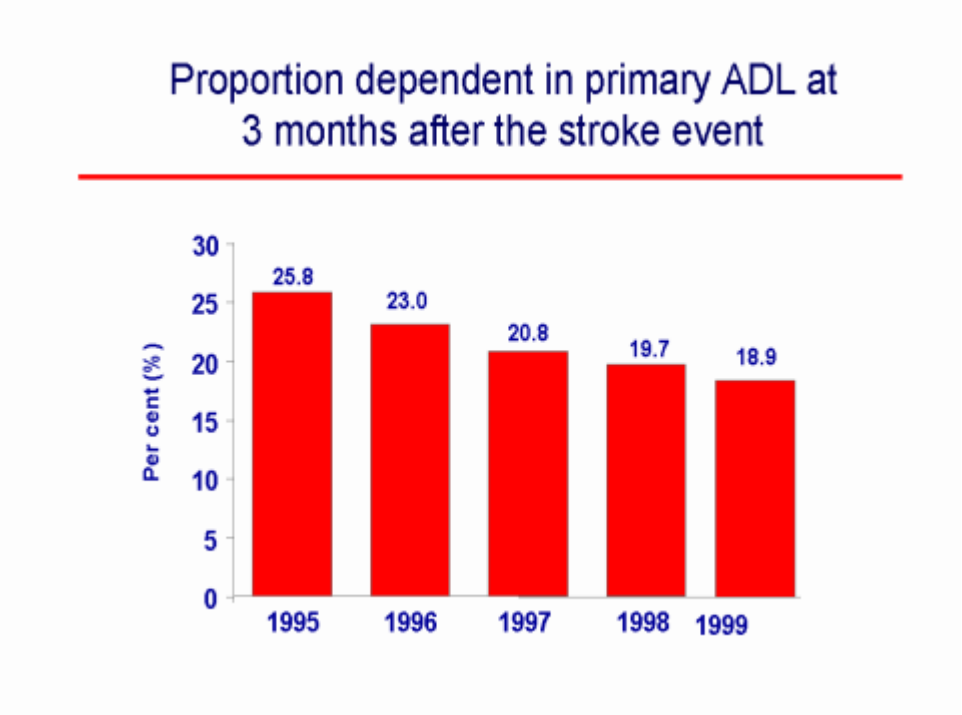

Figure 10

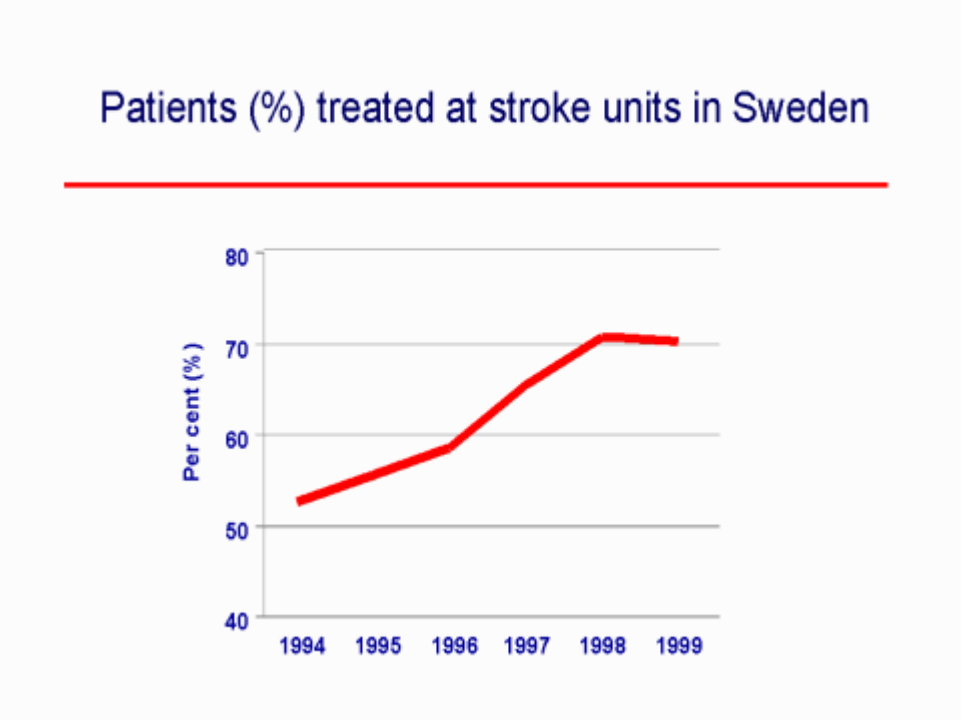

Figure 11

A comparison between patients in stroke units (SU) and patients in general wards (GW), showed that more patients in SU had a better functional outcome three months after the stroke onset. In these analyses, we have looked separately at patients being unconscious and patients fully alert on admission. In the comparisons between SUs and GWs, all patients who were living at home, moved independently and who had no help with their ADL before the stroke event were compared. In the patients with no impaired consciousness on arrival to hospital, those cared for in SUs had significantly better outcome at three months in terms of proportion patients living at home without assistance, moving independently and showing independence in primary ADL (Figure 12). In patients with impaired consciousness, on the other hand, no differences were seen between patients cared for in SUs and GWs (Figure 13). In this group of patients only 20% were discharged to their own homes, moved independently and managed their primary ADL without help.

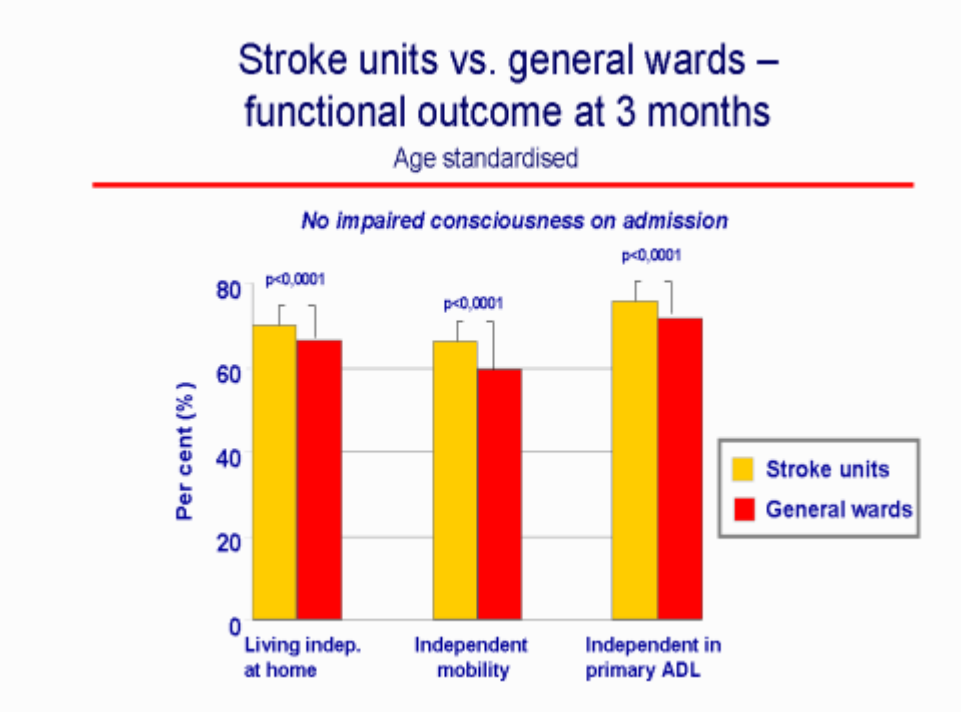

Figure 12

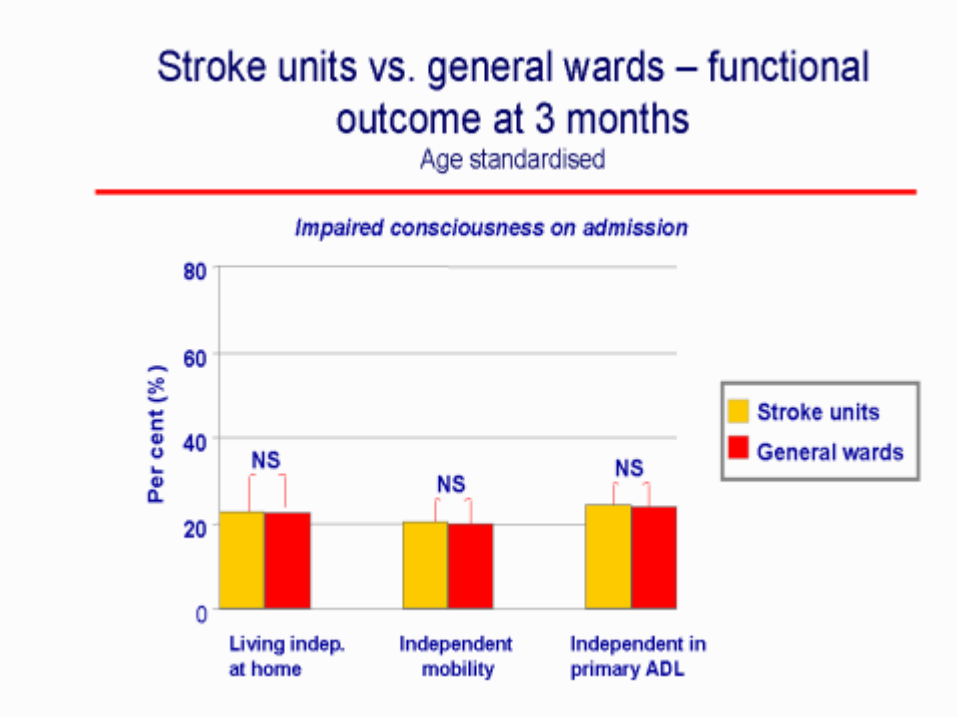

Figure 13

Also in terms of case fatality rates, significantly differences were seen between SUs and GWs at 7, 28 and 90 days after the event. SUs had lower case fatality, both in patients with no impaired consciousness as well as in unconscious patients (Figure 14 and 15) compared to GWs.

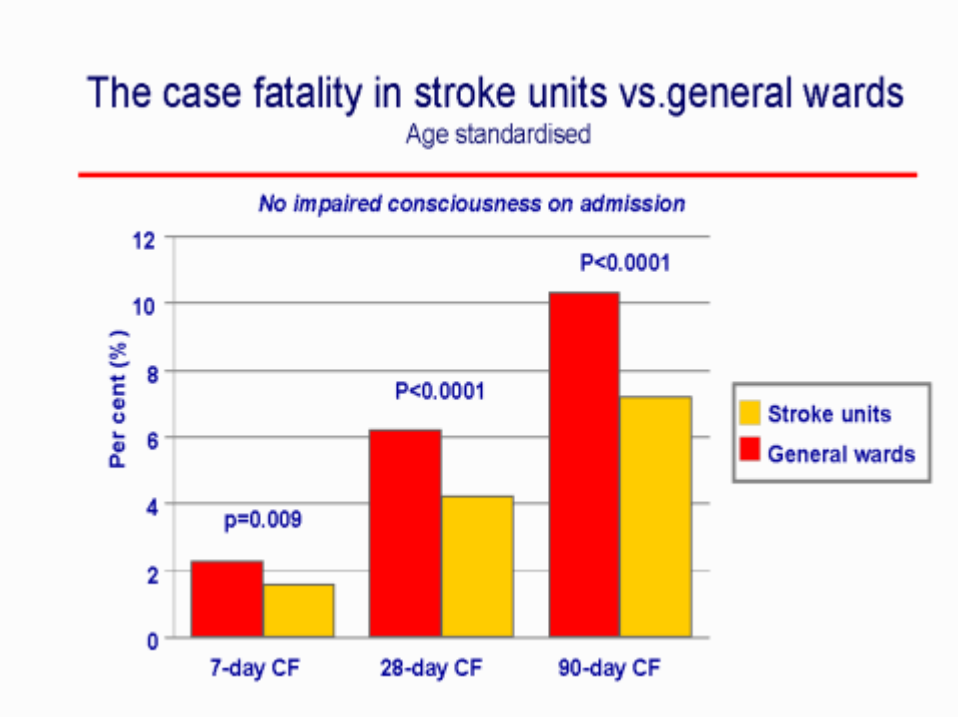

Figure 14

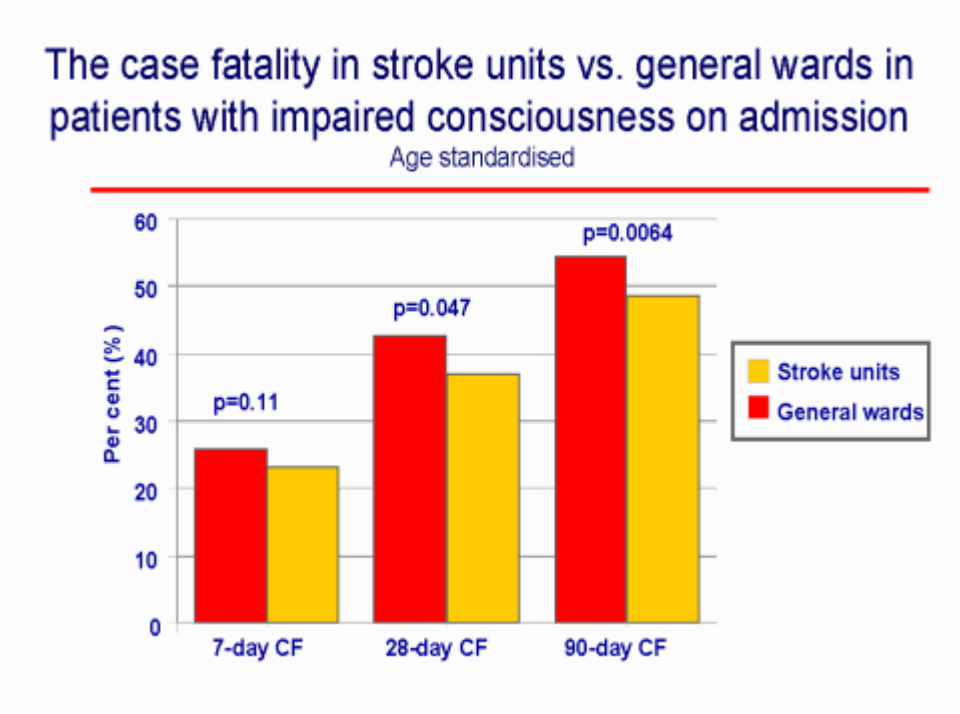

Figure 15

DISCUSSION

Riks-Stroke is the first register with a national coverage that assesses the quality of management of acute stroke care. It allows regional and inter-hospital comparisons as well as comparisons of the impact of structural differences in stroke services. In the present report, trends have been followed on process and outcome for stroke for the last five years. Riks-Stroke permits also comparisons on the outcomes of patients treated in designated stroke units with patients treated in general medical or neurological wards.

From 1998 all hospitals in Sweden join the Riks-Stroke collaboration. On the other hand, this is not equal to that every single stroke patient treated in hospitals is included in the register. A validation study of the register has shown that more than 80% of all patients in Swedish hospitals are included in the register (Glader et al. in manuscript). So far, the register includes around 80,000 events and the register increases with around 20,000 new cases each year.

To build up a national register like Riks-Stroke is a considerable undertaking. Much effort has been made to stimulate and get support from management of the hospitals to improve the participation in a quality register like Riks-Stroke. The collaboration is completely voluntary and the personnel working with Riks-Stroke as well as the needed equipment have to be financed by the local hospital.

The steering committee for Riks-Stroke has constantly a dialogue with the users, particularly in what the users want to monitor. Consequently, the register is under continuously improvement. Since January 2001, the stroke registration is administrated over Internet. That means that the data is available instantly for the users for comparisons and analyses.

In Sweden almost all stroke patients are treated in hospitals. Population based epidemiological studies have shown that more than 95% of all stroke patients are admitted to an acute hospital (2-4). In addition, almost all hospitals in Sweden are serving a defined geographic area and you have, as a patient, actually no opportunity to choose between different hospitals. Since the catchment area for each hospital is rather extensive, the different hospitals are probably based on the same case-mix. Of cause the age of the patients can differ between hospitals in rural compared with urban situated hospitals. The case mix does not differ particularly and therefor you have the possibility to compare hospitals with each other. The Swedish organization of the health care system limits the risk of selection bias.

Many of the results from Riks-Stroke show that there is definitely rooms for improvements, to a smaller or larger extent, in many of the hospitals. For instance, the proportion patients with ischemic stroke and atrial fibrillation, who were discharged with anticoagulants, varied from below 10% in some hospitals up to 50% in others suggesting that this evidence-based therapy is being underused.

When Riks-Stroke started, about half of all patients were treated in stroke units. Five years later 70% of the stroke patients were cared for in non-intensive stroke units. The results from meta-analysis have shown stroke units to save lives and improve the outcome (5, 6). These studies were all randomized control trials that showed a reduction of 29% in deaths or dependency. Others studies have shown beneficial outcome in patients cared for in stroke units, also many years after the care (7, 8). In Sweden we had the opportunity (with the Riks-Stroke data base) to see if these beneficial results could be replicated in the routine care of stroke patients. The first year we compared data on patients was 1996 (9), and the data show the same convincing resu lts each year onwards. Stroke units save lifes and reduce disability. More patients survive, and fewer patients need support with ADL. More patients are able to return to their own homes after the discharge from hospital. If 1,000 patients were treated in a stroke unit instead of a general ward, 72 more patients could return back home without support and help, 41 fewer would be discharged to nursing homes and 28 more patients would survive.

The introduction of Riks-Stroke and the results emerging from it have probably propelled the establishment of stroke units in Sweden. One aim with Riks-Stroke is to promote and inspire to improvements in the care of stroke patients. The results emerging from Riks-Stroke can be a stimulus to the hospitals to examine their routines and they can serve as a base for changes and improvements.

If you want to read more about the quality register in Sweden, you can download the following document http://www.sos.se/FULLTEXT/0000-046/0000-046.pdf .

ABSTRACT

Background and Methods:

The national quality register for stroke patients started during 1994. It covers the acute phase of stroke events in hospitals and a 3-month follow-up. Since 1998, all Swedish hospitals caring for stroke, patients participate in the register. Annual reports are sent to each participating hospital containing the results for that hospital in comparison with the national data.

Results:

For 1998 and the first half of 1999, all hospitals in Sweden (N=84) submitted data on 28,881 stroke events. A 3-month follow-up was performed in 92% of the patients. The mean ages, (73 years in men and 75 years in women) have not changed over the five years. The proportion of patients in stroke units (SU) has increased from 54% in 1994 to 70% in 1999 and more than 96% of all patients were examined by CT scan. The 28-day case fatality has not changed over time, between 11.5 and 12.7% died the first month. During the first week, 69.4% patients with ischemic stroke received aspirin, 27% other antiplatelet agents and 15% heparin. In all ages, 29% of the patients with atrial fibrillation had anticoagulants before the onset or had it prescribed the first week after the onset, with a large variation between the hospitals. Only 0.4% were treated with trombolytic agents. Three months after the stroke event, the proportion that was dependent upon others with dressing and toilet visits has decreased from 27.5% in 1994 to 19% in 1999. In comparisons between patients admitted to SU and patients cared for in general wards (GW), more patients in SUs showed better outcome at follow-up three months after the event.

Conclusion:

It has been feasible to establish a quality register for stroke patients in every hospital in a whole nation. The register provides essential data for improvements in the stroke care and a powerful instrument to monitor changes over time.

Acknowledgement

The Riks-Stroke organization is supported by a grant from the Swedish National Board of Health and Welfare. This study was also supported by grants from the Swedish M edical Research Council (Grants 2000-27GX-13574-01A and 27P-12314 to BS), the Stroke Fund, and the Swedish Public Health Institute. Also we express our gratitude to all participating hospitals and to Mrs. Ann Staaf for administrational matters.

REFERENCES

1. Uemura K. International trends in cardiovascular diseases in the elderly. Eur Heart J 1988;9 (Suppl D):1-8.

2. Stegmayr B, Asplund K. Measuring stroke in the population: quality of routine statistics in comparison with a population-based stroke registry. Neuroepidemiology 1992;11:204-13.

3. Norrving B, Löwenhielm P. Epidemiology of stroke in Lund-Orup, Sweden, 1983-85. Incidence of first stroke and age-related changes in subtypes. Acta Neurol Scand 1988;78:408-13.

4. Terént A. Increasing incidence of stroke among Swedish women. Stroke 1988;19:598-603.

5. Stroke Unit Trialists´ Collaboration,. How do stroke units improve patients outcome? A collaborative systematic review of the randomised trials. Stroke 1997;28:2139-44.

6. Stroke Unit Trialists´ Collaboration. A systematic overview of specialist multidisciplinary team (stroke units) care for stroke in-patients. In: Update Software ed: Warlow C, van Gijn J, Sandercock PAG. eds. The Cochrane Database of Systematic Reviews (available through Br Med J); 1998.

7. Indredavik B, Bakke F, Slordahl SA, Rokseth R, Haheim LL. Stroke unit treatment. 10-year follow-up. Stroke 1999;30:1524-7.

8. Jørgensen HS, Kammersgaard LP, Houth J, Nakayama H, Raaschou HO, Larsen K, et al. Who benefits from treatment and rehabilitation in a stroke unit? A community-based study. Stroke 2000;31:434-9.

9. Stegmayr B, Asplund K, Hulter-Åsberg K, Norrving B, Peltonen M, Terent A, Wester PO. Stroke units in their natural habitat: can results of randomized trials be reproduced in routine clinical practice? Riks-Stroke Collaboration. Stroke 1999;30:709-14.

Top

Your questions, contributions and commentaries will be answered
by the lecturer or experts on the subject in the Stroke list.
Please fill in the form (in Spanish, Portuguese or English) and press the "Send" button.

Question, contribution or commentary:

Name and Surname:

Country: Argentina

E-Mail address: @

Send **Erase**

Top

2nd Virtual Congress of Cardiology

Dr. Florencio Garófalo
Steering Committee
President
fgaro@fac.org.ar
fgaro@satlink.com

Dr. Raúl Bretal
Scientific Committee
President
rbretal@fac.org.ar
rbretal@netverk.com.ar

Dr. Armando Pacher
Technical Committee - CETIFAC
President
apacher@fac.org.ar
apacher@satlink.com

This company contributed to the Congress:


Gador