ORIGINAL PAPER/*ARTYKUŁ ORYGINALNY*

Organization of acute stroke services in Poland – Polish Stroke Unit Network development

Organizacja opieki udarowej w Polsce – rozwój sieci oddziałów udarowych

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Neurologia i Neurochirurgia Polska 2013; 47, 1: 3-7
DOI: 10.5114/ninp.2013.32934

Abstract

Background and purpose: According to the recommendations of stroke organizations, every stroke patient should be treated in a specialized stroke unit (SU). We aimed to evaluate the development of the SU network in Poland during the past decade.

Material and methods: In Poland, stroke is treated mainly by neurologists. A questionnaire evaluating structure and staff of neurological departments was sent to all neurological departments in 2003, 2005 and 2007. In 2010, we collected data based on information from the National Health Fund. We divided departments into categories: with a comprehensive SU, with a primary SU unit, and departments without an SU. Primary SUs were further divided into class A SUs (fulfilling criteria of the National Programme of Prevention and Treatment of Stroke Experts – eligible for thrombolysis), class B (conditionally fulfilling criteria), and class C (not fulfilling criteria).

Results: Final analyses included 87.4% of departments (194/222) in 2003, 85.5% of departments (188/220) in 2005, and 83.1% of departments (182/219) in 2007. According to the above-mentioned classification there were 20 class A SUs in 2003, 58 in 2005 and 5 comprehensive and 51 class A SUs in 2007. In 2012, based on information from the National Health Fund there were 150 SUs, all fulfilling criteria for thrombolysis, 9 of them comprehensive SUs.

Conclusions: The SU network in Poland is developing dynamically but thrombolysis and endovascular procedures

Streszczenie

Wstęp i cel pracy: Zgodnie z rekomendacjami organizacji udarowych każdy chory na udar mózgu powinien być leczony na wyspecjalizowanym oddziale udarowym. Celem niniejszej pracy była ocena rozwoju sieci oddziałów udarowych w Polsce w ostatniej dekadzie.

Materiał i metody: W Polsce chorzy na udar mózgu są leczeni głównie przez neurologów. W latach 2003, 2005 i 2007 do wszystkich oddziałów neurologii w Polsce rozesłano ankietę oceniającą ich strukturę organizacyjną i personel. W 2010 r. zebrano informacje o istniejących oddziałach udarowych na podstawie danych z Narodowego Funduszu Zdrowia. Oddziały neurologii podzielono na oddziały z wszechstronnymi pododdziałami udarowymi, z podstawowymi pododdziałami udarowymi oraz oddziały neurologii niemające w swojej strukturze pododdziałów udarowych. Wśród podstawowych pododdziałów udarowych wyróżniono: pododdziały klasy A (spełniające kryteria opracowane przez ekspertów Narodowego Programu Profilaktyki i Leczenia Udaru Mózgu – mogące stosować leczenie trombolityczne), klasy B (warunkowo spełniające kryteria) i klasy C (niespełniające kryteriów).

Wyniki: Do końcowej analizy włączono 87,4% oddziałów neurologii (194/222) w 2003 r., 85,5% oddziałów (188/220) w 2005 r. i 83,1% oddziałów (182/219) w 2007 r. Zgodnie z klasyfikacją pododdziałów klasy A było: 20 w 2003 r., 58 w 2005 r. i 51 w 2007 r. Dodatkowo w 2007 r. funkcjonowało 5 wszechstronnych pododdziałów udarowych. Opie-

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Received: 25.05.2012; accepted: 2.07.2012

are done too rarely. Now it is necessary to improve quality of stroke services and to make organizational changes in the in-hospital stroke pathways as well as to organize continuous education of medical staff.

Key words: stroke unit, classification, development, network.

rając się na danych z Narodowego Funduszu Zdrowia, w 2010 r. było 150 pododdziałów udarowych, wszystkie spełniały kryteria leczenia trombolitycznego, a 9 z nich było wszechstronnymi pododdziałami udarowymi.

Wnioski: Rozwój sieci pododdziałów udarowych postępuje dynamicznie, ale mimo to leczenie trombolityczne i procedury wewnątrznaczyniowe są wykonywane zbyt rzadko. Obecnie konieczna jest poprawa jakości oferowanej opieki udarowej poprzez zmiany organizacyjne w szpitalach oraz ciągłą edukację personelu medycznego.

Słowa kluczowe: oddział udarowy, klasyfikacja, rozwój, sieć.

Introduction

Stroke is a disabling and often deadly disease that affects millions of inhabitants worldwide each year [1]. Population aging is one of the most important demographic trends nowadays. With the aging, the social impact of stroke will increase over the next decades [2-4]. Appropriate clinical management is necessary to reduce the burden of stroke. It has been established since the 1990s that appropriate organization of care in stroke has the same role as introduction of new therapies in the acute phase of stroke. Results of several clinical trials have proved that interdisciplinary stroke unit care providing optimization of diagnostic and therapeutic processes and appropriate early rehabilitation in stroke patients is superior to conventional stroke care on general neurology/medical wards [5-13]. The effectiveness of stroke units in reducing mortality, institutionalization, and dependence has been confirmed [14,15] and implementation of multidisciplinary interventions supported by evidence-based protocols for management of stroke patients can additionally improve patient outcomes after discharge from stroke units [16,17].

The WHO Regional Office for Europe in 1995 and 2006 have aimed in the Helsingborg Declarations to provide access to specialized care in stroke units or by stroke teams to all stroke patients [18,19]. Many guidelines also have recommended stroke units as the basic standard of care for all stroke patients admitted to hospital [20-25].

On the basis of the first Helsingborg Declaration, the initiative of opinion leaders in neurology in Poland led to the establishment of the National Stroke Prevention and Treatment Programme (Polish abbreviation – NPPiLUM) in 1998. After the completion of NPPiLUM in 2002, the programme was incorporated into the National Cardiovascular Disease Prevention and Treatment Programme (Polish abbreviation – POLKARD) and was continued. These programmes were accepted by the Ministry of Health in Poland as being national health programmes with central funds. Developing the stroke unit network was one of the main goals of these programmes.

In 2000, the project of the Polish stroke unit network was prepared. There should be 120 specialized units to cover easy access to stroke care in Poland (2709 neurological beds for stroke patients) [26].

The aim of our study was to monitor the development of the SU network in Poland and to assess the accessibility of stroke units fulfilling organizational criteria for thrombolysis.

Material and methods

Since stroke in Poland is treated mainly by neurologists, a questionnaire evaluating the stroke management, structure and staff of neurological departments was prepared in 2003 [9]. It was supplemented with information regarding the use of new therapies in acute stroke in 2005. The questionnaire was sent to all hospitals with neurological departments in their structure across the country in 2003, 2005 and 2007. Each received questionnaire was checked and any doubts were verified by telephone call or by e-mail. Every time, data were collected in the computerized database and analyses were performed.

Neurological departments were divided into those with or without the separate structure of a stroke unit. Stroke unit was defined as a separate part of a neurological department with dedicated beds and designated staff for acute stroke patients. Stroke units were classified as described earlier [9] as:

- class A stroke unit (fulfilling the criteria for organization of stroke units established by the Experts of

National Stroke Prevention and Treatment Programme and EUSI guidelines) [8], eligible for implementing systemic thrombolysis 24 hours/7 days a week,

- class B stroke unit (meeting above-mentioned criteria conditionally – mainly shortage of staff or laboratory and computed tomography not available the whole week),
- class C stroke unit (not fulfilling the criteria but having the name "stroke unit").

In 2007, there was distinguished a supreme category of a comprehensive stroke unit, where there is on-site availability of interventional neuroradiology, neurosurgery and 24/7 availability of magnetic resonance imaging (MRI) and new methods of stroke treatment were introduced.

Every time, the classification of stroke units was presented to regional consultants in order to verify our data. After the verification, the final classification was prepared. Taking their comments into consideration, the final results were prepared. Also, 5.5% of departments in 2007 were randomly selected and audited by us (I.S.-D.).

In order to further monitor stroke unit network development, we collected data based on information from the National Health Fund on where financial resources for SU treatment (including thrombolysis) were allocated in 2010. When making a decision about cost refund for stroke treatment, the National Health Fund is now using criteria for stroke unit comparable to our criteria for stroke unit class A.

Table 1. Development of the stroke unit network in Poland – number and classification of stroke units in 2003, 2005, 2007 and 2010

Stroke unit category	Number of stroke units			
	2003	2005	2007	2010
Comprehensive	–	–	5	9
Class A	20	58	51	141
Class B	56	40	53	–
Class C	14	7	2	–
Total	90	105	111	150

n – number of stroke units eligible for thrombolysis
(*n* – number of comprehensive stroke units)

Fig. 1. Location of stroke units in Poland in 2010

Results

Final analyses included 87.4% of departments (194/222) in 2003, 85.5% of departments (188/220) in 2005, and 83.1% of departments (182/219) in 2007. In 2003 there were 90 stroke units, in 2005 there were 105, and in 2007 there were 111. The precise distribution among classes according to our classification is shown in Table 1.

In 2003, there were 1211 (44.7%) from initially planned stroke beds and 71 208 patients with acute stroke were treated during one year in all hospitals which responded to the questionnaire. Only 15.4% (10 959 patients) were treated in departments having SU class A, eligible for implementing systemic thrombolysis. People from only nine voivodships had access to a stroke unit delivering thrombolysis in a place near their home. Between 2003 and 2005, the accessibility of class A stroke units markedly improved. In 2005, there were 1624 stroke beds (59.9% of initially planned ones) and 74 509 stroke patients were treated in all hospitals. A total of 24 761 patients (33.2%) were treated in class A stroke units. Each voivodship had at least one class A stroke unit. Between 2005 and 2007, we observed further development of the stroke unit network in Poland. In 2007, there were 1883 stroke beds (69.5% of initially planned ones) and 82 585 stroke patients were treated in all hospitals. A total of 27 324 patients (33.1%) were treated at comprehensive and class A stroke units.

Based on information from the National Health Fund, in 2010 there were 150 stroke units in Poland, all of them fulfilling criteria for thrombolysis, and 9 of them were comprehensive stroke units, having a possibility of endovascular acute treatment (Fig. 1). Unfortunately, the quality of stroke units is not in fact periodically controlled according to our criteria.

Discussion

Dynamic changes in organization of acute stroke services has been observed in Poland since 1997. The number of stroke units fulfilling the criteria has increased rapidly and regional disparities in access to good quality stroke units have decreased. This blooming development of the stroke unit network was mainly a consequence of efforts by Polish leaders in the field of neurology and the result of expenses allocated to this goal during the implementation of national programs (NPPiLUM and POLKARD) accepted by the Ministry of Health in Poland. These stroke programmes have supported the purchase of appropriate equipment of stroke units and education of medical staff.

Despite all these achievements, new problems need to be solved. We have a quite well organized stroke unit network, but still many appropriately equipped stroke units that fulfil all criteria for thrombolytic treatment do not use recombinant tissue plasminogen activator (rt-PA) routinely, and the reason remains unclear. In Poland, the overall proportion of patients treated with rt-PA is still small: In 2008 less than 1% of all patients suffering ischaemic stroke received thrombolysis [27]. In 2009, based on information from the National Health Fund, 1661 patients (about 2% of all stroke patients) received systemic thrombolysis. Rt-PA was used in 69 stroke units only; in 5 of them the proportion of patients treated with rt-PA was higher (about 20%) but 64 stroke units thrombolysed less than 3% of hospitalized stroke patients. Those stroke units with a higher proportion of patients treated with rt-PA underlined that it was possible because of organizational changes in the in-hospital stroke pathways, education of medical staff (including interpretation of computed tomography scans by physicians on duty) and an informative campaign in the local community and medical services [28,29]. It is important to shorten the door-to-needle time, which in Poland is significantly higher than in other countries (82 *vs* 68 minutes) [30]. In the forthcoming years, it is necessary to expand safe and more effective treatment with intravenous thrombolysis in the first 4.5 hours after the stroke onset in all stroke units.

The next stage of development of the stroke care system in Poland should be consistent with the latest revised and updated recommendations for the primary stroke centres proposed by the Brain Attack Coalition. According to these recommendations, one of the new points is to have the ability to perform brain imaging with MRI and diffusion-weighted images (not only computed tomography scan) at a primary stroke unit [31]. Brain MRI is more sensitive than head computed tomography for detecting small strokes, acute strokes, and processes that could produce stroke-like symptoms, and the results of this examination could significantly change the further evaluation and therapy [32]. We should organize the certification programme for stroke centres to ensure the proper assessment of infrastructure, personnel, protocols, and treatment of patients with acute stroke. Such certification should be done by an independent body, including a site visit and disease performance measures [31].

Most stroke patients can be treated appropriately at primary stroke units, but some patients require intensive care and specialized techniques that are available only at comprehensive stroke centres. In Poland, there have been a few comprehensive stroke centres since 2007, but only 29 patients received intra-arterial thrombolysis and 17 patients underwent mechanical embolectomy in 2010 in the whole of Poland. Moreover, regional disproportions in accessibility to comprehensive stroke centres are still significant. There is a need to organize new comprehensive stroke centres and try to introduce in all existing comprehensive stroke centres metrics proposed by the Brain Attack Coalition for standardized measuring of quality of care [33].

Conclusions

1. The process of creation of the stroke unit network in Poland is dynamic, but it is necessary to introduce activities aimed at improvement and constant monitoring of stroke services – acute care as well as post-stroke care and rehabilitation.
2. The improvement of stroke services quality, organizational changes in the in-hospital stroke pathways, and continuous education of medical staff can expand the use of systemic thrombolysis treatment and endovascular procedures, which are done too rarely.
3. There is a need to continue generating policies and new programmes, as well as to concentrate on improving services that can reduce the burden of stroke.

Acknowledgements

The article pertains to the National Cardiovascular Diseases Prevention and Treatment Programme 2003-2008. The authors thank all those doctors from neurological departments for their cooperation in completing the questionnaire.

Disclosure

Authors report no conflict of interest.

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