Stroke unit versus neurology ward
A before and after study

Introduction

Previous studies and meta-analyses have provided evidence favoring care of stroke patients in specialized units [6, 13]. Recent systematic review by “Stroke Unit Trialists’ Collaboration” including twenty three trials showed a reduction in the odds of death, death or dependency, and death or institutionalized care for patients hospitalized in Stroke Units (SUs) [15]. This information originated mostly from studies comparing the outcome of stroke patients admitted to stroke units with patients hospitalized in general medical or geriatric wards [3, 15]. The results of studies comparing such care designs may not apply to other health systems where neurology wards are pivotal in handling stroke patients. Indeed, among studies on the efficacy of SUs, very few included patients hospitalized in a neurology ward as the control group. Only one study included in the systematic review by Stroke Unit Trialists’ Collaboration [15] compared the outcomes of stroke patients hospitalized in an acute, intensive dedicated stroke unit with conventional care in a neurology department [7]. This study failed to demonstrate any benefit.

In our institution stroke patients are admitted to the neurology service and independent of their functional
status, most of them are discharged home and cared for by their relatives owing to the lack of sufficient rehabilitation beds and nursing home facilities. Although well-conducted community studies are lacking, this practice pattern is the prevailing one in most metropolitan areas in Turkey. The implementation of the concept of SU care necessitates important changes in the organization of hospital services [4] and before such changes can occur, more information is needed as to whether the beneficial effects of such units can also be observed in different health systems and outside trial settings. In this study, using case mix data analysis, we aimed to compare the outcome of stroke patients followed in our newly established stroke unit with the outcome of patients previously hospitalized in our neurology service. Subgroup analyses were also performed to evaluate which patient groups, if any, benefit the most from such an organized care.

Patients and methods

Patients

Istanbul Medical Faculty Neurology Department is one of the three university neurology clinics in Istanbul, serving a population of nearly 10 million inhabitants. All stroke patients presenting to the hospital of our faculty are initially evaluated in general emergency rooms and subsequently hospitalized in the Neurology Department. The Neurology Ward [NW] is a 50-beds area, which is situated in the Neuroscience Building together with the Neurosurgery Ward. Computed tomography and neurosonology laboratories are located in the same building; CT is available 24-hours a day and ultrasonographic examinations are performed by a senior neurologist during working hours. When necessary, the Critical Care Department provides help in the acute management but it does not accept stroke patients directly. Owing to the health care system in Turkey, most of the hospitalized patients come directly from their homes, and only a minority of patients is referred from other hospitals or family physicians. In our institution there is no specific patient admission policy and admission is solely governed by the availability of beds. When all beds are occupied, patients can briefly be admitted to the short-term observation beds of the emergency room if a bed is expected to be available in the stroke unit in 48 hours or they are transferred to another hospital known to have a neurology service. Sometimes and depending on their clinical status (minor stroke, lacunar syndromes, stable clinical situation etc) patients are evaluated on an ambulatory basis in our stroke clinic when there is no other alternative. The patient population of our university clinics including the neurology department mostly consists of people registered in one of the two state health insurance systems, mainly the “Pension Fund of State Officers” and “Workers Social Security Regime”. This population constitutes a low-income group.

All 704 patients with ischemic and hemorrhagic strokes, with transient ischemic attacks and cerebral venous thromboses admitted consecutively between January 1997 and August 2000 to the Istanbul Medical Faculty Neurology Department are included in the study.

General evaluation of stroke patients

Since the beginning of 1997 all stroke patients are managed by the same team of physicians dedicated to stroke patient care. The group is composed of 4 senior neurologists. Diagnostic and therapeutic decisions for individual patients are made by participation of all of them. All admitted patients have a detailed neurological and general physical examination. Computed tomography (CT), electrocardiography (EKG), chest radiography, prothrombin time, activated partial thromboplastin time, complete blood count and serum chemistries are performed in the first 2 hours after admission. Magnetic resonance imaging (MRI) is performed when indicated. Neurosurgery and cardiology consultations are obtained as needed. Extracranial and transcranial Doppler ultrasonography is mostly performed within the first 24 hours. Magnetic resonance angiography and cardiac studies such as transthoracic echocardiography are performed in the majority of patients with ischemic events. Digital subtraction angiography, transesophageal echocardiography, 24-hours Holter EKG monitoring and tests for coagulation disorders are performed for selected patients.

Care by Stroke Neurologists in the NW

From the beginning of 1997 until April 1999, stroke patients were managed in the NW with a nurse/patient ratio of 1:12 during day and 1:24 at night, and the main aspects of care (nursing, physiotherapy) were not different from the rest of patients having other neurological diseases. Two residents were taking part in the management. Nurses were not dedicated to stroke patients. Physiotherapists were not systematically involved in patient care and were consulted when needed. Involvement of carers was encouraged.

Care in the SU

From April 1999 on, all stroke patients are admitted in the “Edip Ak-tin Stroke Unit” (EASU), a twelve-bed unit separated from the rest of the NW. All hospitalised acute stroke patients are followed during at least 48 hours in the “Stroke Intermediate Care Unit” (SICU), which is a division of the EASU having four beds and nurse/patient ratio of 1:4 during the day. Each bed in this intermediate care unit is equipped with the means to continuously monitor heart rate, respiratory rate, cutaneous oxygen saturation, non-invasive arterial blood pressure, and temperature. Subsequently, stabilized patients are transferred in the 8 subacute care-beds with a daytime nurse/patient ratio of 1:4; diminishing to 1:8 in summer during annual vacation of the personnel. During night shift the nurse: patient ratio of the whole unit becomes 1:12. Apart from the above mentioned specialist physician group, one stroke fellow and 2 residents take part in the daily management of patients. Nurses are dedicated to stroke patients. Three physiotherapists (physiotherapist/patient ratio of 1:4) systematically evaluate the patients on admission and follow them until discharge. Carers take part in every aspect of care, especially nutrition, mobilization and passive or active exercises after being intensely educated by nurses and physiotherapists. Educational programs and multidisciplinary staff rounds directed to different aspects of care and follow-up of patients are performed weekly. No written protocol is used in the organization and planning of care. A senior cardiologist performs all the transthoracic echocardiographic examinations in the Neuroscience Building.

Treatment strategies in NW or EASU

Basic strategies of specific and preventive treatment of patients with cerebrovascular disorders have not changed and treatment decisions have been taken by the same team of physicians since 1997. Acetyl salicylic acid 300mg per os is administered to all ischemic stroke patients on admission if not contraindicated. Thrombolytics are not routinely administered, and general principles governing antiplatelet, anticoagulant, antihypertensive, anti diabetic medication use are similar. Neurosurgical interventions such as decompressive surgery or ventricular drainage are performed when needed.

Data Collection

Istanbul Stroke Registry (ISR) is a hospital-based registry including all stroke patients hospitalized to Istanbul Medical Faculty Neurology