Secondary Prevention and Health Promotion after Stroke: Can It Be Enhanced?

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The aim was to study if health outcome and secondary prevention were satisfactory 1 year after stroke and if nurse-led interventions 3 months after stroke could have impact. Design was a randomized controlled open trial in a 1-year population. Primary outcome was health status 1 year after stroke. One month after stroke, survivors were randomized into intervention group (IG) with follow-up by a specialist nurse (SN) after 3 months (n = 232), and control group (CG) with standard care (n = 227), all to be followed up 1 year after stroke. At the first follow-up, patients graded their health, replied to the EuroQol-5 Dimensions (EQ-5D) health outcome questions, health problems were assessed, and supportive counseling was provided in the IG. Health problems requiring medical interventions were primarily referred to a general practitioner (GP). One year after stroke, 391 survivors were followed up. Systolic blood pressure (BP) had decreased in IG (n = 194) from median 140 to 135 ($P = .05$), but about half were above the limit 139 in both groups. A larger proportion (22%) had systolic BP >155 in the CG (n = 197) than in the IG (14%; $P = .05$). In the IG, 62% needed referrals compared with the 75% in the CG ($P = .009$). Forty percent in the IG and 52.5% in the CG ($P = .04$) reported anxiety/depression. In the IG, 75% and 67% in the CG rated their general health as fairly good or very good ($P = .05$). Although nurse-led interventions could have some effect, the results were not optimal. A more powerful strategy could be closer collaboration between the SN and a stroke clinician, before referring to primary care. **Key Words:** Health promotion—nurse's role—referral and consultation—risk factors—secondary prevention—stroke.

The number of beds in Swedish hospitals has decreased over the past decades, and the patient flow has been speeded up considerably, particularly for the older people in hospital care as reported by the National Board of Health and Welfare.[1] According to The National Guidelines for Stroke Care in Sweden, long-term follow-up is expected to be performed in primary care regarding effect of medical treatment, functional status, complications, rehabilitation, and counseling.[2] A study has shown that management of risk factors after stroke should be more efficient, by improving compliance to guidelines and by making patients more aware of their risk factors.[3]

The 5 main risk factors for a first-ever or recurrent stroke are specified in the European Stroke Strategies to be; hypertension, smoking, lack of physical exercise, atrial fibrillation, and type 2 diabetes,[4] with physical activity found to improve health and well-being.[5] This was confirmed in

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a report covering 22 countries with addition of diet risk score, alcohol intake, hyperlipidemia, psychosocial stress, depression, and cardiac causes.[6] Pain and fatigue are also common health problems after stroke and may coexist with depression.[7,8] A randomized controlled trial based on home visits by nurses giving counseling on healthy lifestyle found that 62% (n = 187) were still hypertensive 1 year after stroke with no difference between the groups, although patients complied with antihypertensive therapy and GP visits if needed.[9]

Another study of risk factors among 889 patients with recurrent stroke showed that 75% had hypertension, 56% hyperlipidemia, 29% atrial fibrillation, and only 21% among the 180 patients with cardiac embolism were on anticoagulation treatment.[10] Thus, it was concluded that although these patients had a stroke before, their major risk factors had not been treated in accordance with guidelines, which was also the conclusion in another study of achievement of treatment goals in secondary prevention.[11]

As reported previously, several studies have shown that there is a lack of secondary prevention after stroke. It is therefore important to find evidence-based methods to improve the poststroke health care. The aim of this study was to examine to what extent a 1-year population of stroke patients at a university hospital had well-regulated risk factors and health problems 1 year after stroke and if a structured nurse-led previous follow-up including referrals, if needed, could influence health outcome and risk factors 1 year after stroke.

Methods

Sample

The Skåne University Hospital, Malmö, mainly serves the population of Malmö (N = 286,535; 2008). All patients with a first-ever or recurrent stroke, with preliminary diagnosis cerebral infarction or intracerebral hemorrhage admitted to the stroke unit at the Department of Neurology between February 1, 2008, and January 31, 2009, were registered for possible inclusion in the study. Medical histories of all consecutive 606 patients living in the City of Malmö were reviewed by a specialist nurse (A-C.J.) in co-operation with a senior neurologist (H.P-R.) to ascertain the stroke diagnosis. Nine of the 606 patients with preliminary stroke diagnosis did not strictly fulfill the World Health Organization (WHO) definition of stroke,[12] thus 597 patients with a first-ever or recurrent stroke were registered as eligible to participate in the study (Fig 1).

Design and Setting

Information about the study was given to the patients by a nurse at the stroke unit during the acute care phase. Eligible patients were informed that they would be invited to the outpatient clinic for follow-up once or twice randomly. Informed consent was obtained from each participant, or from spouse or significant other if the patient was confused or had sensory dysphasia. After written consent was obtained, baseline data were collected from the hospital records and/or stated by the patient. Functional status was assessed by an occupational therapist within the first 3 days after arrival at the hospital using the Barthel Index[13] (score 0-100, divided into 3 grades of dependence: 95-100 independence, 60-90 moderate dependence, and 0-55 major dependence).[14]

As the mortality rate is particularly high the first month after stroke,[15] patients were not randomized into 2 groups until 1 month after stroke. At that time, 459 survivors were randomized, stratified for age and gender to create 2 similar groups; 232 into the intervention group (IG) to be followed up at 3 months after stroke and 227 into the control group (CG) with standard care (Fig 1). Standard care was defined as no outlined follow-up after hospital discharge until 1 year after stroke.

The study was designed as a randomized controlled open trial, following the CONSORT Checklist of Items for Reporting Trials of Nonpharmacologic Treatments.[16] The random allocation into 2 groups was performed by the administrative secretary using lists made by the second author (P.H.) who used a computer-generated, randomization procedure with stratification for age and gender with the proc PLAN SAS (SAS institute, Cary, NC). The administrative secretary registered the participants consecutively in the randomization lists and made up lists of the patients to be called for follow-up by a specialist nurse (SN, A-C.J.) at 3 months and at 1 year after stroke. A SN was defined as a nurse with specialist competence in stroke care.

The procedure of the follow-up was specified in a protocol by the SN in the same way after 3 months and after 1 year to ascertain the same procedure for all patients. Patients living in ordinary housing were examined at the outpatient clinic, whereas those living in nursing homes were assessed with assistance of the nurses who were familiar with the status of the patients.

The study was approved by the Regional Ethical Review Board, Lund University, Registration No 520/2007. The study protocol was registered at the ClinicalTrials.gov (NCT01466907).

Assessments to Determine Need for Intervention

The follow-up protocol is described under the subheadings *Risk factors, Patients' self-reports*, and *Other health problems*. A referral was sent to a physician, if the values measured were above the limits stated in the follow-up protocol in accordance with guidelines[17] and/or if any self-reported health problems were stated by the patients or had been detected by the SN. Significant others were invited to accompany the patients and to assist in replying to questions, if the patient had dysphasia or other communication problems.