Quality of hospital care and health outcomes after stroke
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INTRODUCTION
Since the second half of the nineteenth century the life expectancy in the Netherlands has almost doubled. In 1850, the mean life expectancy at birth was about 36 years for men and 38 years for women whereas this increased to 75 years for men and 80 years for women in 1994.\textsuperscript{1,2} An important consequence of the increase in mean life-expectancy is an increase of the number of elderly in the population. Moreover, the proportion of elderly is expected to rise even more due to demographic changes, especially the post-war baby-boom. In 1996, 13\% of the Dutch population was older than 65 years. By the year 2035 the population elderly is predicted to be 24\%.\textsuperscript{3} The ‘ageing’ of the population will lead to more chronically ill people and hence to a greater demand for health care. Since healthcare expenditures are limited and healthcare services are relatively scarce, more knowledge about the consequences of chronic diseases is needed.

Subject of this thesis is the quality of hospital care and the long-term health outcomes of patients who suffered a stroke. The study included a cohort of 760 consecutive stroke patients admitted to 23 randomly selected Dutch hospitals. Data were collected from the medical and the nursing records and the surviving patients were interviewed 6 months, 3 years and 5 years after stroke. The data collection took place between June 1991 and December 1996.

1.1 Stroke

Stroke, a major chronic condition, is defined as the sudden onset of focal neurological disturbances lasting more than 24 hours or leading to death, with no other apparent cause than a vascular disturbance.\textsuperscript{4} Most strokes are ischemic (85\%) and less often it concerns a hemorrhage (15\%). The distinction between an ischemic and a hemorrhagic stroke can not be determined by clinical signs and symptoms. Stroke consequences are mainly determined by the size and location of the lesion. The impact of stroke may be devastating. About 30\% of the patients die in the acute phase, whereas about 50\% of all survivors have a substantially impaired health status.\textsuperscript{5} In these patients, both the physical and psychosocial functioning are often seriously affected.\textsuperscript{6,7} Therefore, it is understandable that stroke patients complain of a poor health more often than patients with other chronic conditions.\textsuperscript{10}
In the Netherlands, the annual incidence of stroke is estimated to be 174/100,000 and its prevalence 650/100,000.\textsuperscript{2,5} There are about 100,000 stroke survivors living in the Dutch population. Due to ageing of the population, the absolute number of strokes is expected to rise with 41% to 61% in the year 2020.\textsuperscript{11} Furthermore, stroke is the third cause of death and a major cause of disabilities among the elderly. Of all disabilities in basic activities of daily living among people aged 65 years and older, 20% is due to strokes.\textsuperscript{12} In addition, more than 3% of the Dutch annual healthcare costs involves stroke patients.\textsuperscript{13} The high prevalence of stroke together with the high prevalence of disabilities among stroke survivors and the relatively high healthcare costs, make stroke a major chronic disease both from the perspective of the patients and from that of the society in general.

1.2 Quality of hospital care

Most stroke patients in the Netherlands are admitted to the hospital during the acute phase of their illness.\textsuperscript{14,15} An important reason for hospital admission is to perform diagnostic procedures which are followed by interventions to prevent the occurrence of new strokes or other vascular events. Another major reason for hospitalization is to provide appropriate nursing care during the acute phase. Another aspect in the treatment of stroke patients is mobilization and rehabilitation to optimize functional recovery. About 60% of all patients who survive the hospital phase returns home, 15% is referred to a rehabilitation center, and 25% is transferred to a nursing home.\textsuperscript{16}

Mainly due to the performance of many clinical trials in recent decades, more knowledge about effective interventions after stroke has become available. One of the most widely cited recent definitions describes quality of care as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge".\textsuperscript{17} In this view, high quality of care should be in concordance with the available scientific knowledge. This is also known as 'evidence based medicine'. A next step in assuring quality of care is to summarize all available knowledge in guidelines. In the Netherlands a consensus meeting for stroke guidelines was held in 1991.\textsuperscript{18} At that time English guidelines were already available
as well as recommendations for the treatment of stroke patients by the World Health Organisation.\textsuperscript{19,20} It is implied that the dissemination of guidelines will ultimately lead to evidence based practice and hence to quality of care improvements. However, it is unknown to what extent the recommendations are actually applied in the Netherlands. This issue will be addressed in this thesis.

### 1.3 Health outcomes

With the publication in 1980 of the International Classification of Impairments, Disabilities and Handicaps (ICIDH), the World Health Organization provided a conceptual framework to describe the health outcomes in a systematic manner.\textsuperscript{21} In this classification, an impairment is defined as a loss or abnormality of a structure or function at organ level and is therefore a direct manifestation of the disease. Paresis or aphasia are examples of frequently occurring impairments in stroke patients. A disability reflects the consequence of the impairment on a personal level. In general disabilities are defined as limitations in Activities of Daily Living (ADL). The ADL usually refer to the basic activities of daily living, such as dressing and bathing. The more complex activities of daily living, such as shopping or housecleaning, are called Instrumental Activities of Daily Living (IADL). A handicap is a disadvantage for a given individual, due to an impairment or disability, that limits or prevents the fulfillment of a role which is normal for that individual. For example, the loss of a job due to impairments or disabilities can be regarded as a handicap. Another related concept which is frequently used to describe health outcomes is Quality of Life (QoL). Although, over the years, QoL has been defined differently, a wide consensus has emerged that QoL should encompass physical, psychological and social aspects of health.\textsuperscript{22,23} Moreover, QoL is usually considered as a personal and subjective evaluation of a patient's health status.

Health outcomes can be used in randomized clinical trials to establish the effectiveness of a specific intervention.\textsuperscript{24} Health outcomes can also be used more directly to evaluate the quality of care by comparing the health outcomes between different providers. The assumption is that the health care provider with the best outcomes (after adjusting for case-mix)
performs care with the highest quality. However, assessing quality of care with outcome measures has a major limitation: outcome measures are relatively insensitive to differences in the quality of the process. This especially concerns (chronic) stroke care, where the effects of care are usually modest.

1.4 Objectives and outline of the thesis

The study objective was to develop instruments to evaluate the quality of hospital care and to measure the health outcomes after stroke. Furthermore, we evaluated certain aspects of the quality of Dutch hospital care and described the short-term and long-term health outcomes.

In Chapter 2, we describe an instrument to assess the quality of medical hospital care. Explicit criteria for evaluation were developed by expert physicians. Some of these criteria were evidence-based while others were based on opinions. The quality of some aspects of medical hospital care for stroke patients in the Netherlands is examined.

Chapter 3 also concerns the quality of hospital care. Many stroke patients remain in the hospital for a longer period of time because they are waiting for discharge placement. This indicates an inefficient use of scarce and expensive hospital resources, but may also indicate a possible deficit in the quality of care in the Netherlands. Hospitals are neither designed nor optimally equipped for extensive rehabilitation or intensive nursing care. In this Chapter we quantify the number of days patients spent in hospitals waiting for discharge placement.

Chapter 4 is concerned with the health outcomes after stroke. A well-known instrument to describe functional health is the Sickness Impact Profile (SIP). The SIP with its 12 subscales and 136 items, measures a wide range of dysfunctions. The SIP emphasizes observable behavior instead of subjective health perceptions. This makes the instrument very suitable for stroke patients who often suffer from aphasia or dysarthria. To overcome the major disadvantage of the SIP, its length, we constructed a short Stroke Adapted 30-item SIP version (SA-SIP30). The development of the SA-SIP30 is described.

Chapter 5 discusses the clinical meaning of the SA-SIP30 and the original SIP version. Since the (SA)SIP(30) measures physical, emotional
and social functioning in terms of observable behavior instead of subjective health perceptions, it is not clear whether it measures disability or quality of life. The clinical meaning of the SA-SIP30, and the original SIP136, is examined by comparing them to other frequently used stroke outcome measures derived from both the ICIDH model and the QoL model. Furthermore, different cut-off scores of the (SA)SIP(30) are presented, to facilitate the interpretation of the continuous scale scores.

In Chapter 6, the health outcomes up to five years after stroke are described in terms of survival and the ability to live independently. Furthermore, we assessed the impact of stroke type on (a) mortality within the first 6 months, (b) mortality between 6 months and 5 years, and (c) functional status 5 years after stroke.

Chapter 7 presents a general discussion on the strengths and the weaknesses of the present study. We will discuss the implications on the care for future stroke patients.

Finally, a summary in English and Dutch concludes this thesis.

1.5 References


Chapter 1


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