

Critical Pathway and Hospital-Hospital Cooperation in Acute Stroke

Reduction of the Length of Hospital Stay

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Summary

Stroke patients tend to stay longer in one hospital compared to patients with other neurological disease.

After the introduction of 3 types of critical pathway dedicated for various severity of acute ischemic stroke in 1995, the average length of in-hospital days declined from 30.0 days (1993) to 15.3 days (1998), ie 49% reduction.

This reduction was achieved by the use of critical pathway and the hospital-hospital cooperation.

Introduction

Patients admitted to neurological ward, especially stroke patients have longer length of hospital stay. Stroke patients treated in a specialized stroke unit have been reported to have better outcome¹.

In our hospital, however, acute stroke care is taken place on general wards. To minimize the variety and improve the level of acute stroke care, we made critical pathways of acute brain infarction.

The aim of the present study was to test the

hypothesis that the length of hospital stay could be reduced by the use of critical pathway.

Subject and Methods

We obtained data from 2314 patients admitted to the departments of neurology and strokology, Kumamoto City Hospital from April 1993 to March 1998. We made three types of critical pathway of brain infarction which was composed of A, B and C courses, March 1995. We used these critical pathways to stroke, especially ischemic stroke, since April 1995. We evaluated the outcome, discharge rate to other hospitals, and length of hospital stay in 281 cases of acute brain infarction admitted within the first week of onset among 368 cases of ischemic stroke from April 1995 to March 1997. Figure shows an example of present critical pathway (A course for staff).

We also evaluated the number, rate of stroke patients, and the average length of hospital stay of patients admitted to the departments of neurology and neurosurgery of five hospitals in Kumamoto City in 1998.

Results

Brain infarction (April 1995 to March 1997)²

Patients with acute brain infarction referred from other clinics and hospitals, consisted 65% of all patients in our hospital (table 1). The in-hospital mortality was 4%. The discharge rate to other hospitals (hospital-hospital cooperation) was 38%, and the discharge rate to the patient's own home was 58%. The discharge rate to other hospitals and length of hospital stay were, respectively, 21% and 26 days in lacunar brain infarction, 42% and 30 days in

atherothrombotic brain infarction, and 56% and 39 days in cardioembolic brain infarction. The proportion of patients with a length of hospital stay more than 60 days was 8%. The main cause of a long hospital stay was complications. The length of hospital stay was longer and the discharge rate to other hospital was higher in cardioembolic brain infarction than in other kinds of brain infarction.

Length of hospital stay in our department (Kumamoto City Hospital)

The lengths of hospital stay of patients admitted to our departments and to our hospital

Table 1 Outcome of acute brain infarction (April 1995 to March 1997)

Clinical Categories	Lacunar brain infarction	Atherothrombotic brain infarction	Cardioembolic brain infarction	Other and unclassified brain infarction	Total
Number (%)	104 (37%)	71 (25%)	86 (31%)	20 (7%)	281
Age (mean±SD)	70 ± 11	71 ± 10	73 ± 13	61 ± 19	71 ± 12
Male : female	69 : 35	46 : 25	57 : 29	14 : 6	186 : 95
Introduction referred from other hospital(rate)	73 (70%)	43 (61%)	57 (66%)	10 (50%)	183 (65%)
Outcome					
Independent	83 (80%)	42 (59%)	39 (45%)	15 (75%)	179 (64%)
With cane	2 (2%)	7 (10%)	3 (3%)	2 (10%)	14 (5%)
Wheel-chair	16 (15%)	13 (18%)	19 (22%)	1 (5%)	49 (17%)
Bed-ridden	1 (1%)	7 (10%)	18 (21%)	1 (5%)	27 (10%)
Dead	2 (2%)	2 (3%)	7 (8%)	1 (5%)	12 (4%)
Discharge to other hospital	22 (21%)	30 (42%)	48 (56%)	7 (35%)	106 (38%)
Discharge to own home	80 (77%)	39 (55%)	31 (36%)	12 (60%)	163 (58%)
Length of hospital stay					
Patients of discharge to own home	21 days	22 days	27 days	24 days	23 days
Patients of discharge to other hospital	40 days	40 days	49 days	34 days	44 days
Dead patients	107 days	42 days	20 days	4 days	37 days
Total	26 days	30 days	39 days	27 days	31 days
Patients with hospital Stay over 60 days(rate)	4 (4%)	5 (7%)	14 (16%)	0 (0%)	23 (8%)

were showed in table 2. Stroke patients and non-stroke patients were included. Stroke patients consisted of almost 50~60% among all admitted patients, every year. Most of stroke patients were brain infarction, transient ischemic attack and ocular ischemic syndrome. The length of hospital stay reduced 49% (30.0 days in 1993 to 15.3 days in 1998).

Patients admitted to five hospitals

Table 3 shows number and the length of hospital stay of patients admitted to three neurological departments, and table 4 shows data in the five neurosurgical departments.

Discussion

Patients admitted to neurological and neurosurgical wards, especially stroke patients have longer length of hospital stay. Evidence favoring treatment of stroke patients on specialized stroke units is accumulating¹.

The length of hospital stay (including rehabilitation) was reduced significantly if patients

are treated on the stroke unit despite their lower mortality¹. But, in our hospital acute stroke care is taken place on general wards. To start the rehabilitation in early stage and reduce the length of hospital stay of acute stroke, we made critical pathways for acute brain infarction.

Table 2 Number of all admitted patients and the length of hospital stay

Year	Number (cases)	Length of hospital stay of department of neurology (days)	Length of hospital stay of all patients of our hospital (days)
1993	272	30.0	25.6
1994	312	27.4	25.3
1995	352	23.3	23.5
1996	367	22.9	22.5
1997	468	20.4	21.7
1998	543	15.3	20.8

Table 3 Number of admitted patients and the length of hospital stay in the Department of Neurology(1998)

Hospital	Number of all patients (length of hospital stay)	Number of ischemic stroke patients (length of hospital stay)
Kumamoto City Hospital	543 cases (15.3 days)	225 cases (17.8 days)
Saiseikai Kumamoto Hospital	705 cases (13.8 days)	432 cases (16.5 days)
National Kumamoto Hospital	147 cases (21.6 days)	46 cases (24.4 days)
Total	1394 cases (15.2 days)	703 cases (17.4 days)

Table 4 Number of admitted patients and the length of hospital stay in the Department of Neurosurgery (1998)

Hospital	Number of all patients (length of hospital stay)	Number of stroke patients (length of hospital stay)
Kumamoto City Hospital	164 cases (21.5 days)	50 cases (30.9 days)
Saiseikai Kumamoto Hospital	868 cases (18.7 days)	461 cases (21.7 days)
Kumamoto Red Cross Hospital	536 cases (26.4 days)	202 cases (37.0 days)
National Kumamoto Hospital	201 cases (25.1 days)	63 cases
Kumamoto Regional Medical Center	322 cases (19.0 days)	144 cases
Total	2091 cases (21.6 days)	920 cases

氏名	年齢	性別	病歴	入院日	2日目	3日目	4日目	5日目	6日目	7日目	8~13日目	14日目
治療方針 達成目標												
経過												
検査												
安静度												
リハビリ												
排便												
清潔												
食事												
点滴												
内服												
全身管理												
説明												
その他												

Acute stroke including brain infarction varies in symptoms and signs, clinical category, mechanism, distribution, and severity.

Therefore we made three types of critical pathway (A, B, and C courses) in March 1995. The length of hospital stay in our department was 30.0 days in 1993, 27.4 days in 1994 in which exceeded the mean length of hospital stay in our hospital. We used critical pathway of brain infarction from April 1995. The length of hospital stay was reduced 49% (30.0 days in 1993 to 15.3 days in 1998) by the introduction of critical pathway.

Hospital-clinic and hospital-hospital cooperation were also contributed to reduction of the length of hospital stay. Rehabilitation in the recovery stage (2~3 weeks to about 6 months from the stroke onset) could be done in the specialized rehabilitation hospitals within the Kumamoto City area due to hospital-hospital cooperation. Now our acute stroke team can concentrate on the treatment of stroke including early rehabilitation in the acute stage (within 2~3 week from the onset). And rehabilitation team makes rehabilitation in the recovery stage.

Conclusions

The length of hospital stay of neurological patients, especially stroke was reduced by the introduction of critical pathway.

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