

POSTER SESSION 1

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Impact of Socioeconomic Status and Demographics on the Pattern of Stroke Rehabilitation Utilization

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Background and Purpose

Stroke is a disease that causes disability in a considerable number of patients and requires rehabilitation treatment after onset. As such, rehabilitation of stroke patients can be a social burden. The aim of this study is to find the influence of socioeconomic status and demographics in rehabilitation utilization after stroke.

Methods

We analyzed the National Sample Cohort from 2008 to 2013 with regards to the relationship between socioeconomic status and the pattern of using the rehabilitation resources after stroke. We divided the patients into two groups according to the types of insurance premium payment and the rehabilitation treatment period into acute and chronic stages by six months after the onset. We confirmed the pattern of rehabilitation facility utilization and the mean of hospitalization days. One Way ANOVA was utilized for detecting the relationship between the income grade and the hospitalization days of each medical facility. A Bonferroni correction was correction was applied for multiple comparisons.

Results

In both premium payment systems, there were many male insurance holders and, on the contrary, beneficiaries were women (Table 1). In both types of health insurance premium in acute and chronic stages, beneficiaries had been hospitalized longer than insurance holders. The gap of age and hospitalization days between insurance holders and beneficiaries in Self-employed was lesser than that of the employed. In acute stage of stroke, there was no relationship between the income grade and the type of hospital utilization. However, in chronic stage, the highest income group were more likely to be hospitalized in a general hospital in both types of premium payment. Mean hospitalization days of income grade 1 was not longer than those of other groups. Higher

income did not correlate with longer hospitalization days in both insurance premium groups (Table 2, 3).

Conclusions

The difference of demographics due to insurance payment types and socioeconomic status influenced the pattern of rehabilitation medical facility utilization. Thus, we hope to provide background data for making a new, reasonable and universal stroke rehabilitation referral system through our study Results.

Table 1. Demographic factor classified by health insurance type

	Self-employed insured								Employed insured							
	Insurance holder (high → low)				Beneficiary (high → low)				Insurance holder (high → low)				Beneficiary (high → low)			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Subject, no.	208	406	585	728	179	336	304	184	95	190	158	228	939	1803	931	623
Sex, no.																
Male	186	332	429	368	34	68	61	50	91	177	133	182	396	844	456	296
Female	22	74	156	360	145	268	243	134	4	13	25	46	543	959	475	327
Age, no.																
20-29	0	0	0	2	3	8	3	4	0	2	4	5	3	7	8	5
30-39	0	12	14	16	7	16	13	7	6	30	14	14	6	21	12	7
40-49	15	47	85	41	17	43	29	16	26	67	35	46	19	30	42	46
50-59	46	125	105	98	25	55	37	25	44	58	61	71	22	141	170	121
60-69	64	109	137	141	36	70	64	33	11	17	27	66	131	498	240	155
70-79	59	77	173	243	51	65	87	54	8	7	13	24	473	778	277	183
> 80	24	36	71	187	40	79	71	45	0	9	1	2	285	328	182	106
Mean Age	66.11	61.90	64.64	70.20	67.31	64.91	67.70	67.71	53.21	50.89	53.06	55.88	74.94	71.23	68.57	66.93
(mean ±	±	±	±	±	±	±	±	±	±	±	±	±	±	±	±	±
SD)	11.26	12.29	13.45	13.35	15.79	16.54	15.26	15.79	9.45	12.80	11.62	11.45	9.81	10.72	12.96	13.01
Disability rating*																
Severe	49	82	126	142	28	47	41	27	7	18	26	42	194	400	206	132
Moderate	31	40	77	109	23	58	57	34	10	10	9	10	151	305	134	98
Mild	128	284	382	257	474	231	206	124	78	162	123	176	597	1098	591	393
Mean	0.62±	0.50±	0.56±	0.54±	0.41±	0.49±	0.51±	0.52±	0.25±	0.24±	0.39±	0.41±	0.57±	0.61±	0.59±	0.58±
Disability Grade	0.84	0.81	0.82	0.80	0.71	0.77	0.79	0.79	0.58	0.61	0.75	0.78	0.81	0.83	0.83	0.82
(mean ±																
SD)																
Stroke type†																
Ischemic	145	265	378	490	106	196	193	113	106	196	193	113	663	1216	627	426
Hemorrhagic	40	107	147	161	58	106	74	50	58	106	74	50	163	364	219	138
Others	23	34	60	77	15	34	37	21	15	34	37	21	113	203	85	59

* Disability rating is categorized by Korean disability grade measured by modified barthel index

† Stroke type : Ischemic stroke includes I63 (cerebral infarction), hemorrhagic stroke includes I60 (Subarachnoid hemorrhage), I61 (Intracerebral hemorrhage), and I62 (Other nontraumatic intracranial hemorrhage) and another type of stroke include I64 (Stroke, not specified as hemorrhage or infarction) and I69(Sequelae of cerebrovascular disease).

Table 2. The total and mean rehabilitation utilization days between hospital grade and income grade of self-employed insured

		Self-employed insured							
		Insurance holder (high → low)				Beneficiary (high → low)			
		1	2	3	4	1	2	3	4
Acute	General Hospital	14.06±13.36	14.50±11.03	14.36±10.14	15.06±12.59	15.70±12.15	15.63±11.67	12.89±10.80*	16.43±11.72
	Inpatient Rehabilitation Hospital	18.14±12.82	18.49±7.95	18.57±10.50	17.90±10.49	21.23±14.12	19.17±11.26	19.32±8.92	20.05±8.14
	Convalescent Hospital	21.15±6.48	21.97±7.82	21.54±7.02	21.19±7.15	20.14±7.97*	22.12±6.18	22.68±7.71	20.70±5.91*
	Outpatient Rehabilitation Therapy	18.62±8.35	12.88±7.09	15.62±12.71	8.91±9.36*	25.93±19.03	19.20±10.46	12.14±7.45*	24.20±10.40
	Total Mean	16.01±12.46*	16.16±10.40	16.72±10.29	17.37±11.09	17.95±11.84	18.16±10.67	16.83±10.50*	18.64±9.63
Chronic	General Hospital	16.99±16.78	13.87±9.84*	10.96±8.83*	12.53±9.48*	17.50±13.66	13.39±9.88*	14.90±9.84	13.49±9.48*
	Inpatient Rehabilitation Hospital	22.45±10.56	22.53±7.22	20.73±9.57	18.97±8.77*	20.30±7.55	21.55±10.13	19.49±10.44*	23.46±8.41
	Convalescent Hospital	22.59±6.11*	23.11±6.10	27.07±4.40	25.64±5.15	26.70±5.01	24.29±5.82*	26.40±5.15	24.58±6.11*
	Outpatient Rehabilitation Therapy	8.07±9.45*	11.41±9.85*	5.76±7.97*	16.84±12.70	27.97±9.21	10.68±7.49*	10.16±8.65*	5.50±7.04*
	Total Mean	19.68±13.08	19.38±9.18	19.39±10.73	20.95±9.28	23.51±9.53	20.71±9.16	20.96±9.78	21.99±8.69

Values are presented as days (mean ± SD).

*One Way ANOVA was used, p-value < 0.05

Table 3. The total and mean medical utilization days and income grade of employed insured

		Employed insured							
		Insurance holder (high → low)				Beneficiary (high → low)			
		1	2	3	4	1	2	3	4
Acute	General Hospital	11.39±8.72	12.50±10.67	11.73±9.18	11.18±8.35	13.66±10.56*	14.56±11.53	15.46±10.71	14.03±10.72*
	Inpatient Rehabilitation Hospital	17.13±12.14	19.35±9.03	18.47±13.46	15.90±12.23	17.67±9.36*	19.46±10.44	19.85±10.51	20.50±9.65
	Convalescent Hospital	26.00±2.30	22.23±3.76	24.25±5.15	23.51±8.38	20.74±7.18	20.09±7.02	21.46±6.36	21.87±7.10
	Outpatient Rehabilitation Therapy	7.50±11.09	6.50±6.03	15.44±4.39	18.06±15.20	11.10±7.52*	14.71±9.59	16.53±11.72	12.50±8.20
	Total Mean	12.63±9.62	13.26±10.21	14.28±10.59	12.78±9.74	16.84±9.79	17.10±10.53	17.95±10.05	17.45±10.29
Chronic	General Hospital	12.91±13.77	13.50±12.19	6.63±4.70*	8.73±7.72*	12.81±9.90	12.10±9.15	13.75±9.73	10.07±8.68*
	Inpatient Rehabilitation Hospital	24.91±7.01	17.79±7.84*	23.77±10.48	15.20±9.51*	20.13±8.94*	21.21±8.80	22.37±10.95	21.56±9.20
	Convalescent Hospital	31±00.	25.04±2.63*	24.15±3.28*	27.79±4.09	24.77±5.83	24.30±5.86	25.43±5.21	23.97±6.30*
	Outpatient Rehabilitation Therapy	1.00±0.00	13.00±10.69	10.96±12.22	3.69±6.18	8.81±10.78	12.02±11.07	12.85±11.83	11.98±11.40
	Total Mean	16.65±13.24	19.28±9.72	14.96±11.02	15.15±11.25	20.94±9.25	19.99±9.52	21.61±9.59	20.40±9.46

Values are presented as days (mean ± SD).

*One Way ANOVA was used, p-value < 0.05