

TIME-COURSE AND EVOLUTION OF UPPER LIMB SPASTICITY DURING THE ONE YEAR FOLLOWING FIRST-EVER STROKE

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OBJECTIVE

Post-stroke spasticity (PSS) is one of functional barrier for stroke survivors. There is a need for early identification and understanding of change of PSS over time. Therefore, we want to establish the change of post stroke spasticity until 12 months from the first ever stroke onset.

METHODS

A multicenter medical record review for incidence of spasticity at the first detection time, 3, 6 and 12 months after the first ever stroke at 10 university hospitals. Except for 186 stroke subjects who lacked medical records on spasticity, 814 stroke subjects with spasticity (454 cerebral infarct and 360 cerebral hemorrhages) were completely reviewed (Fig.1) (Table 1). Main outcome measures were change of post stroke spasticity (PPS) at the elbow, and wrist in hemiplegic upper limb measured by the Modified Ashworth Scale (MAS).

RESULTS

The 1st detection time (median value) and degree of spasticity in all stroke subjects were 1.26 / 30.5days in infarction and 1.35 / 42.0days in hemorrhage, respectively ($p < 0.01$) (Table 2). PPS had changed from at the first detection of spasticity to at 3, 6 and 12 months in hemiplegic elbow (1.16, 1.29, 1.54, 1.82) and wrist (1.23, 1.30, 1.47, 1.84), respectively, but there were no significantly difference between elbow and wrist ($p > 0.05$) (Table 3). In subjects with cerebral infarction, the incidence of spasticity was higher at cerebral cortex, basal ganglia, pons, thalamus, thalamus, medulla, and midbrain in order. However, the order of incidence in those with cerebral hemorrhage was basal ganglia, cerebral cortex, thalamus, pons, and cerebellum (Table 4). In the supratentorial lesion, more severe PPS was developed and aggravated over time (Table 5). For management of PPS, Physiotherapy and occupational therapy were the most basic

treatments, and other treatments were antispastic oral agents, botulinum toxin, and orthosis in order (Table 6, 7).

Conclusion

Post-stroke spasticity in upper limb shows different incidence and the first detection time between types of stroke, and tends to deteriorate over time, especially in cerebral hemorrhage and supra-tentorial lesions.

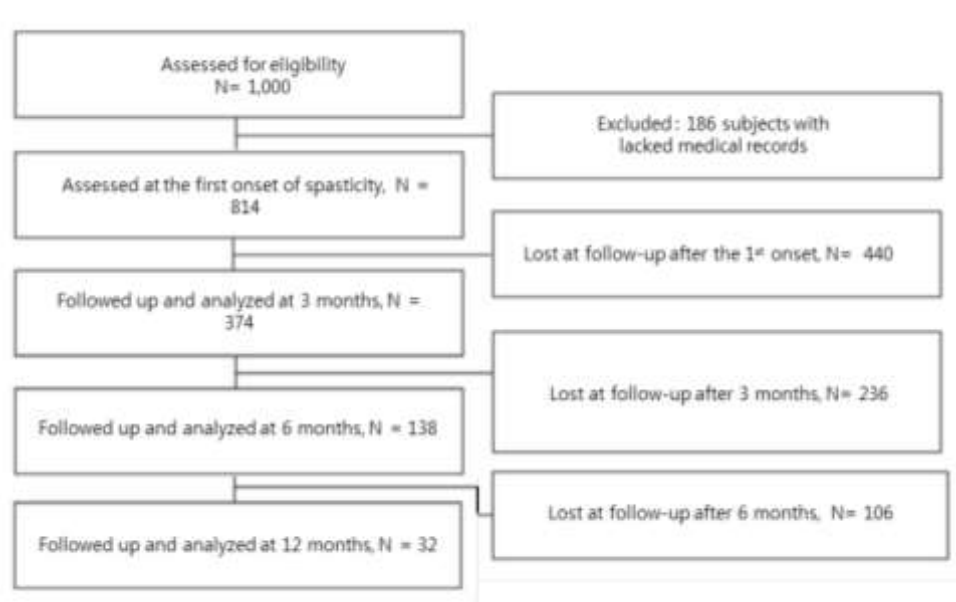


Fig.1 Flow diagram for the subjects with spastic upper limb

Table 2 Time course and distribution of spasticity at hemiplegic elbow flexor muscles

Time (MAS)	N=814		p value*
	Infarction	Hemorrhage	
1 st time to spasticity	1.26±0.44 (median: 30.50 days)	1.35±0.50 (median: 42.00 days)	0.0025 0.0001
Follow-up 3 months	1.29±0.59	1.49±0.66	0.0032
Follow-up 6 months	1.54±0.65	1.54±0.73	0.5299
Follow-up 12months	1.77±0.70	1.85±0.56	0.1339

* : Wilcoxon's rank sum test

Table 7. Different modalities to manage spasticity in subjects for hemiplegic elbow flexor muscles

Modalities	N=814			
	MAS 1 (n=523)	MAS 1+ (n=134)	MAS 2 (n=136)	MAS 3 (n=21)
Physical therapy	100%	100%	99.3%	100%
Occupational therapy	100%	99.3%	99.3%	100%
Oral agents (anti-spastic A)	23.7%	40.3%	28.0%	38.1%
Botulinum toxin injection	5.3%	23.1%	22.1%	23.8%
Orthosis	5.5%	7.5%	10.3%	19.5%
Phenol	0.4%	4.5%	1.5%	4.8%