How do community hospitals perform in acute ischemic stroke treatment in the rt-PA era?

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Background : The Stroke Fast Track Network, which has been development in Thailand to improve stroke care, particularly in community hospitals(CH). This study, aimed to evaluate the quality of acute ischemic stroke care in the various hospital levels.

Methods : Data used in this study were randomly selected from the medical records, which are sent to the National Health Security Office for reimbursement purposes between October 2015 and August 2016. Patient demographics, risk factors, stroke subtypes, stroke severity, quality of care indicators and complications were recorded. Pair comparisons between two groups were carried out using Bonferroni correction.

Results : A total of 947 patients, 169 patients from CHs, 629 from regional hospitals (RH) and 149 from tertiary hospital (TH) were included in the final analysis. The CH group had a higher median age but lower median initial NIHSS than the RH and TH groups (median age = 70, 66 and 67 years, respectively, and initial NIHSS = 6, 8, and 9, respectively). The CH group had shorter onset-to-needle times for rt-PA than the other two groups (147 vs 178.5 and 180 min). The CH group had a lower proportion of asymptomatic intracerebral hemorrhage (0.6%), and lower mortality rate (1.2%) than either the RH or TH group.

Conclusion : Community hospitals have the potential care for acute ischemic stroke patients in the same way as RHs or THs.

Table 1 Demographic and baseline characteristics

Characteristics	Hospital levels				p-value
	CHs (n=169)	RHs (n=629)	THs (n=149)	Total (n = 947)	
Male, n (%)	95 (56.2)	311 (49.4)	71 (47.7)	477 (50.4)	0.23
Age (years), median (IQR)	70 (61-76)	66 (56-75)	67 (58-74)	67 (58-75)	<0.01 ^{a,b}
Risk factors, n (%)					
Diabetes mellitus	49 (29.0)	161 (25.6)	41 (27.5)	251 (26.5)	0.64
Hypertension	82 (48.5)	307 (48.8)	74 (49.7)	463 (48.9)	0.97
Dyslipidemia	56 (33.1)	138 (21.9)	47 (31.5)	241 (25.4)	<0.01 ^a
Chronic kidney disease	2 (1.2)	32 (5.1)	8 (5.4)	42 (4.4)	0.08
Atrial fibrillation	39 (23.1)	144 (22.9)	44 (29.5)	227 (24.0)	0.38
Coronary artery disease	5 (3.0)	39 (6.2)	8 (5.4)	52 (5.5)	0.26
Previous TIA/stroke	22 (13.0)	84 (13.4)	17 (11.4)	123 (13.0)	0.82
Smoking	12 (7.1)	82 (13)	21 (14.1)	115 (12.1)	0.08
Stroke subtype, n (%)					
LAA	52 (30.8)	235 (37.4)	45 (30.2)	332 (35.1)	0.11
CE	42 (24.9)	164 (26.1)	50 (33.6)	256 (27.0)	0.14
SVD	74 (43.8)	224 (35.6)	47 (31.5)	345 (36.4)	0.06
Other determined	0 (0.0)	1 (0.2)	1 (0.7)	2 (0.2)	0.32
Undetermined	1 (0.6)	3 (0.5)	4 (2.7)	8 (0.8)	0.04 ^c
Initial NIHSS, median (IQR)	6 (3-10)	8 (5-13)	9 (6-15)	8 (4-14)	<0.01 ^{a,b}
EKG monitoring, n (%)	74 (43.8)	257 (40.9)	72 (48.3)	403 (42.6)	0.24
Vascular study, n (%)	1 (0.7)	17 (2.9)	27 (18.4)	45 (5.0)	<0.01 ^{b,c}

a :CHs vs. RHs (p <0.05), b :CHs vs. THs (p <0.05),
c: RHs vs. THs (p <0.05)

Table 2 Quality measurement and stroke outcome

Acute stroke care indicators	Hospital levels				p-value
	CHs (n=169)	RHs (n=629)	THs (n=149)	Total (n = 947)	
Onset to needle (min), median (IQR)	147 (120-194)	178.5 (135-210)	180 (143-225)	174.5 (135-210)	0.01 ^{a,b}
Door to needle (min), median (IQR)	55 (40-69)	60 (45-80)	73 (55-94)	60 (48-82)	<0.01 ^{b,c}
Antiplatelet within 48 hours, n (%)	142 (84.0)	463 (73.6)	94 (63.1)	699 (73.8)	<0.01 ^{a,b,c}
Rehabilitations, n (%)	125 (74.0)	490 (77.9)	113 (75.8)	728 (76.9)	0.53
Complications, n (%)					
Pneumonia	30 (17.8)	155 (24.6)	38 (25.5)	223 (23.5)	0.14
Urinary tract infection	4 (2.4)	38 (6.0)	6 (4.0)	48 (5.1)	0.14
Sepsis	7 (4.1)	34 (5.4)	11 (7.4)	52 (5.5)	0.44
Gastrointestinal bleeding	3 (1.8)	21 (3.3)	1 (0.7)	25 (2.6)	0.18
Acute kidney injury	5 (3.0)	27 (4.3)	5 (3.4)	37 (3.9)	0.80
Myocardial infarction	0 (0.0)	1 (0.2)	1 (0.7)	2 (0.2)	0.32
Heart failure	6 (3.6)	14 (2.2)	2 (1.3)	22 (2.3)	0.44
Brain herniation	4 (2.4)	33 (5.2)	12 (8.1)	49 (5.2)	0.07
Asymptomatic ICH	1 (0.6)	31 (4.9)	5 (3.4)	37 (3.9)	0.01 ^a
Symptomatic ICH	5 (3.0)	27 (4.3)	4 (2.7)	36 (3.8)	0.62
Cost (baht), median (IQR)	24,400 (12,654-50,376)	39,506 (17,051-64,315)	53,649 (28,798-79,320)	39,656 (16,689-64,805)	<0.01 ^{a,b,c}
Length of hospital stay (day), median (IQR)	5 (4-6)	5 (4-7)	5 (4-8)	5 (4-7)	0.19
Discharge status, n (%)					
Complete recovery	1 (0.6)	2 (0.3)	4 (2.7)	7 (0.7)	
Improved	145 (85.8)	515 (81.9)	118 (79.2)	778 (82.2)	
Not improved	21 (12.4)	80 (12.7)	12 (8.1)	113 (11.9)	
Death	2 (1.2)	32 (5.1)	15 (10.1)	49 (5.2)	