

Mortality and intervention types of inter-hospital transfer in acute ischemic stroke patients from 2017-2021 in South Korea.

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ISQUA2023

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INTRODUCTION

- In acute stroke patients, the time from onset to treatment is an important factor to improve the patient's health outcomes.
- It is important to receive intravenous tissue-type plasminogen activator(tPA) or endovascular recanalization therapy(ERT) rapidly for ischemic stroke patients.
- Previous study showed that Inter-hospital transfer after use of tPA in acute stroke(drip and ship) may help improve the outcomes in patients.
- In South Korea, considerable variations exist in the availability of healthcare resources for stroke treatment, affecting the inter-hospital transfer.
- Efficient inter-hospital transfer means transferring to a hospital with the level of resources necessary for patient treatment without delay.

AIM

- This study aims to identify efficient inter-hospital transfer by analyzing the 30-day/1-year mortality according transfer and treatment patterns (tPA or ERT).

METHOD

1) Study population

- A total of 283,740 patients urgently admitted to hospitals with acute ischemic stroke(KCD-7 I63) between 2017 and 2021.

2) Database

- The National Health Insurance(NHI) claims data of HIRA

3) Treatment pattern classification

- The interesting variable was the patterns of inter-hospital transfer and treatment(tPA or ERT).

Treatment pattern			
Non-transfer	None		
	tPA or ERT		
Transfer	First hospital	→	Received hospital
	tPA		ERT
	tPA or ERT		None
	None		tPA
	None		ERT

4) Outcome

- 30-day/1-year mortality after admission

5) Statistical analysis

- Multiple Logistic regression analysis

RESULTS

➤ Mortality according to inter-hospital transfer and treatment pattern

Treatment pattern		Total		30-day mortality			
				Crude mortality		Adjusted OR*	
		N	%	N	%	OR	95% CI
Total		283,740	100	13,121	4.6	-	-
Non-transfer		257,386	90.7	11,739	4.6	-	-
First hospital	Received hospital						
	None	223,668	78.8	9,059	4.1	1.00	-
	tPA or ERT	33,718	11.9	2,680	7.9	2.34	(2.24 to 2.45) #
Transfer		26,354	9.3	1,382	5.2	-	-
First hospital	Received hospital						
	tPA	631	0.2	67	10.6	3.50	(2.70 to 4.55) #
	tPA or ERT	1,288	0.5	100	7.8	2.65	(2.15 to 3.27) #
	None	974	0.3	88	9.0	2.79	(2.23 to 3.50) #
	None	1,346	0.5	185	13.7	3.77	(3.21 to 4.43) #
None		22,115	7.8	942	4.3	1.13	(1.05 to 1.21) #

* Adjusted for age, sex, CCI(Charlson's Comorbidities Index), past stroke/TIA history, residence.

- The rate of transferred patients with acute ischemic stroke is 9.3%.
- Transferred patients had higher mortality(5.2%) than non-transferred patients(4.6%).
- Patients who received ERT after transfer without tPA treatment in the first hospital had the highest mortality(13.7%)

➤ The result of subgroup analysis on patients who received ERT

Variable	30-day mortality				1-year mortality			
	Crude OR		Adjusted OR*		Crude OR		Adjusted OR*	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Non-transfer	1.06	0.80-1.39	1.01	0.77-1.34	1.21	0.99-1.47	1.14	0.93-1.40
Transfer								
Tpa → ERT	Ref	-	Ref	-	Ref	-	Ref	-
X → ERT	1.39	1.02-1.90	1.29	0.94-1.77	1.43	1.14-1.79	1.30	1.03-1.64

* Adjusted for age, sex, CCI(Charlson's Comorbidities Index), past stroke/TIA history, residence.

- Reference : patients who received ERT after use of tPA at the first hospital
- (30-day mortality risk) in patients who performed ERT only after transfer
→ Crude OR 1.39(p=0.0401), Adjust OR 1.31(p=0.1125)
- (1-year mortality risk) in patients who performed ERT only after transfer
→ Crude OR 1.43(p=0.0023), Adjust OR 1.33(p=0.0289)

CONCLUSIONS

- Interhospital transfer for ERT after use of tPA at the first hospital may help improve a long-term patient health outcome.
- Even if patients had an indication of ERT, early transferring to a nearby hospital where tPA treatment is available can reduce mortality.
- It is necessary to consider establishing a stroke network so that patients can be transferred directly to the proper hospital for more effective inter-hospital transfer.

ACKNOWLEDGEMENT

- The authors gratefully acknowledge the Healthcare System Enhancement Department of Health Insurance Review and Assessment Service and cooperating hospitals with the cooperation for this article.

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