

LONG-TERM CLINICAL OUTCOME AFTER APPROPRIATE TREATMENT BASED ON EMERGENCY MRI AND INTENSIVE REHABILITATION OVER THE 3 MONTHS FOR SYMPTOMATIC HYPERACUTE ISCHEMIC STROKE

M. Nakazaki*, T. Mori*, N. Chiba*, H. Tajiri*, T. Iwata*,
T. Imanishi**, H. Tanaka***, T. Inoue**** H. Seki*****

*Shonan Kamakura General Hospital, Kamakura, Japan

** Tsurumaki Onsen Hospital, Hatano, Japan

*** Shonan Tobu General Hospital, Chigasaki, Japan

**** Shonan Kinen Hospital, Kamakura, Japan

***** Shin-Hokuryo hospital, Chigasaki, Japan

BACKGROUND and PURPOSE

We aimed to investigate effectiveness of appropriate treatment according to probable stroke subtypes on the basis of emergency MRI and intensive rehabilitation over 3 months for symptomatic hyperacute ischemic stroke and to find the most important predictor of long-term clinical outcome.

PATIENTS

<Study period> 1 January 2006 to 1 February 2008.

< Inclusive criteria>

- 1) patients who presented neurological symptoms of one or more of NIHSS score on admission
- 2) patients who underwent emergency MR imaging for accurate diagnosis for ischemic and vascular lesions,
- 3) patients in whom appropriate treatment was started within 3 hours from stroke onset,
- 4) patients who underwent intensive rehabilitation over 3 months.

Emergency MR study and Initial treatment

- ◆ The patients underwent DWI, T2WI, T2*WI, 3D time-of-flight MR angiography (TR/TE/flip angle, 28/6.9/20°), and PWI (rMMT, rCBV, rCBF) by emergency MRI (Signal Echo Speed 1.5T GE Yokogawa medical system, Tokyo, Japan).
- ◆ Initial treatment was determined respectively based on emergency MRI and MRA.
- ◆ Initial treatment of options were recanalization therapy (intravenous rt-PA therapy and endovascular therapy) and conservative therapy (antiplatelet drug, anticoagulant drug, Neuroprotectant drug, and rehabilitation (1 hour per day)).

REHABILITATION

If intensive rehabilitation was required, the patients were transferred to hospitals specialized for rehabilitation (HSR) from the emergency hospital (Shonan Kamakura General Hospital) as soon as possible. The HSR hospitals provided the patients with maximal hours of 3 of rehabilitation per day up to 6 months from stroke onset by using National Health Insurance.

EVALUATION

Patients' age, sex, treatment modality, NIHSS score on admission, NIHSS score on seven days, and modified Rankin scale (mRS) at 3 months were assessed.

These factors were analyzed to find the most significant predictor of 3-month mRS.

Table. 1 Basal characteristic of patients (N=140)

Age years	72±11
Male n(%)	85(60.7)
NIHSS score	
Median	8
Minimum	1
Maximum	34
Medical History	
Stroke n(%)	15(10.7)
Diabetes n(%)	43(30.7)
Hypertension n(%)	96(68.6)
Hyperlipidemia n(%)	41(29.3)
Smoking in year before stroke n(%)	13(9.2)
Atrial fibrillation n(%)	81(57.9)
ischemic heart disease n(%)	10(7.1)
Congestive heart disease n (%)	9 (6.4)

Result

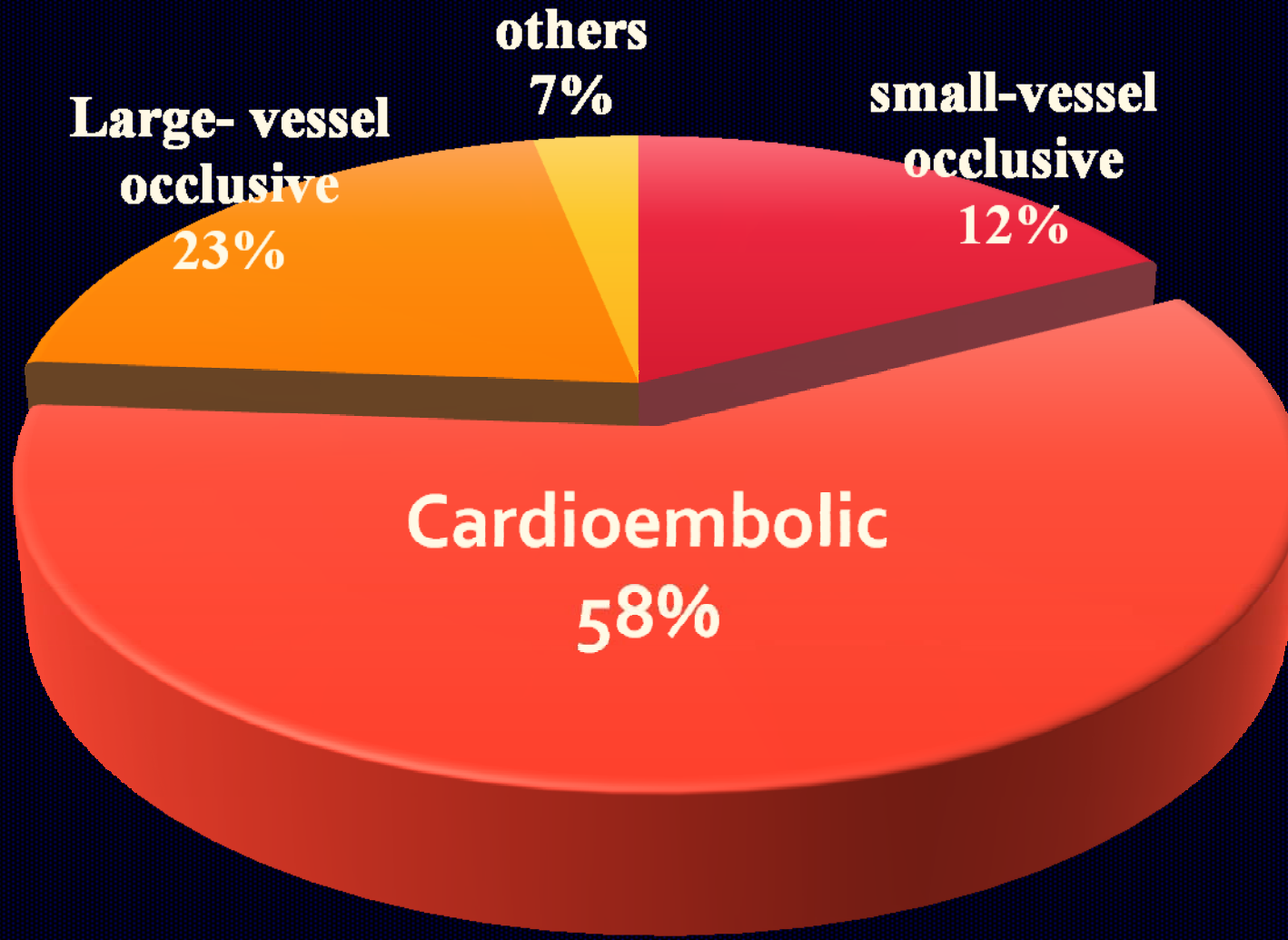


Figure . 1 stroke subtype

Table.2 Initial treatment (n=140)

◆ Recanalization therapy	29(20.7)
● Intravenous rt-PA	9
● Endovascular therapy	20
Localized intra-arterial fibrinolysis	6
Clot Removal therapy	6
Percutaneous transluminal Cerebral balloon angioplasty	8
◆ Conservative therapy	111(79.3)

N(%)

Figure 2. NIHSS changes at 7 days

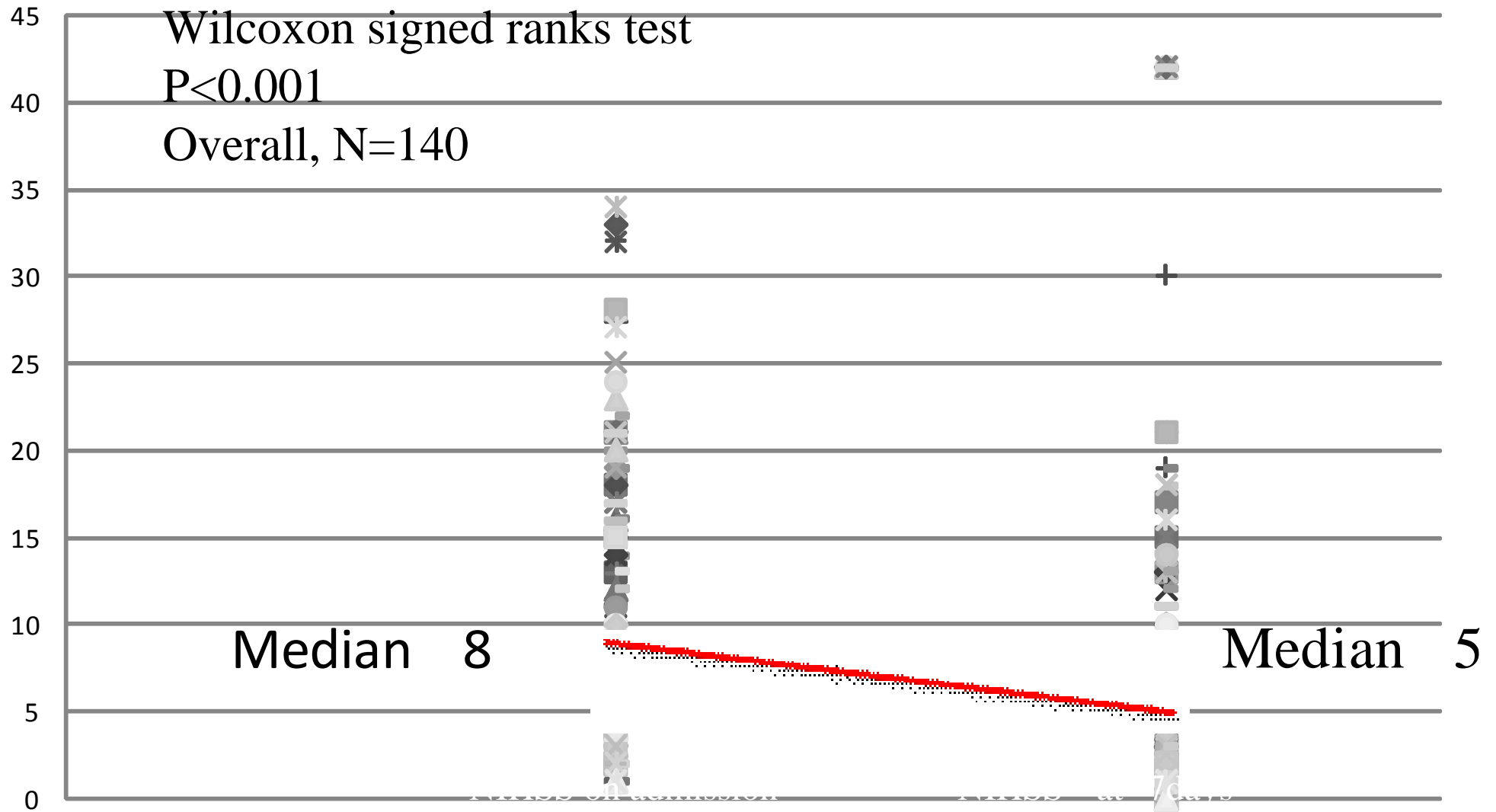


Figure 3. Flow chart from the emergency hospital

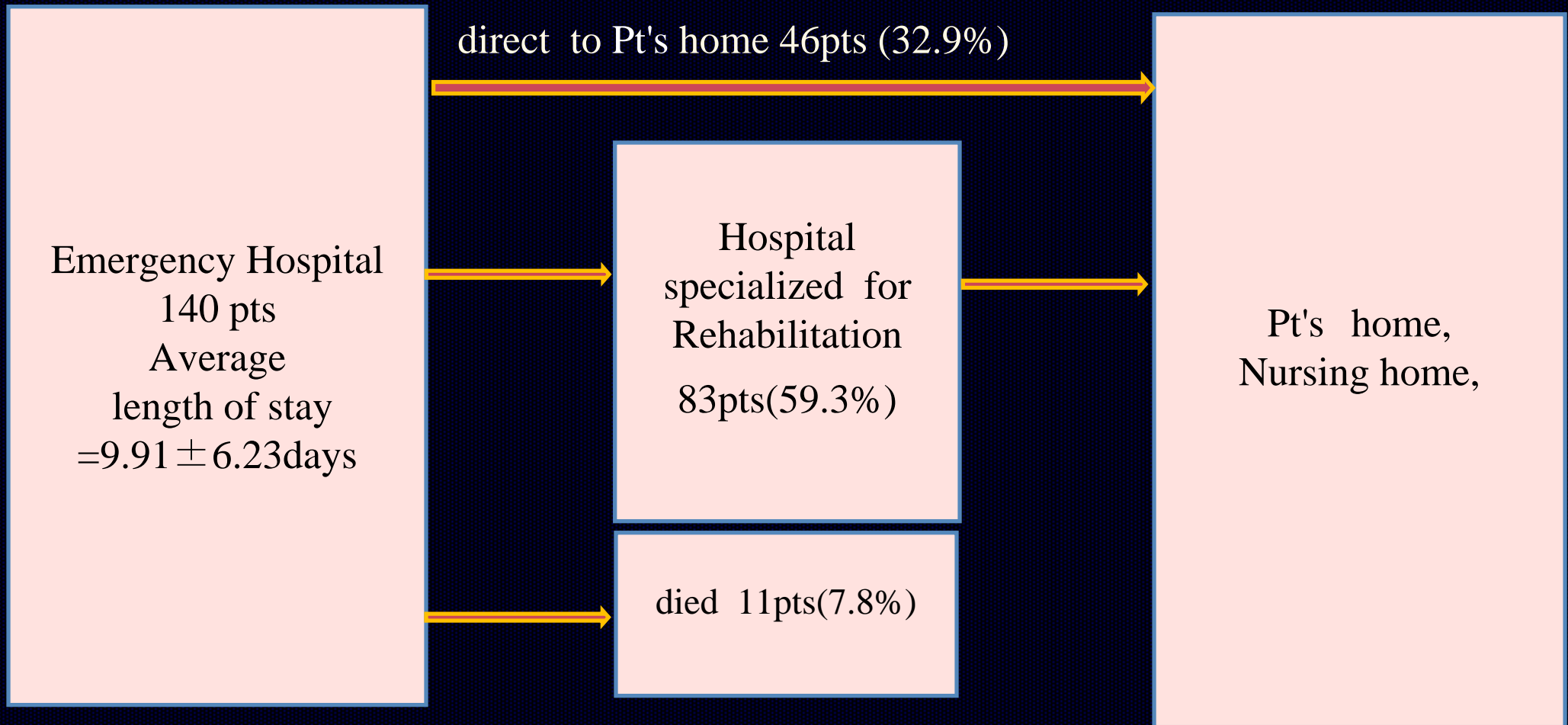
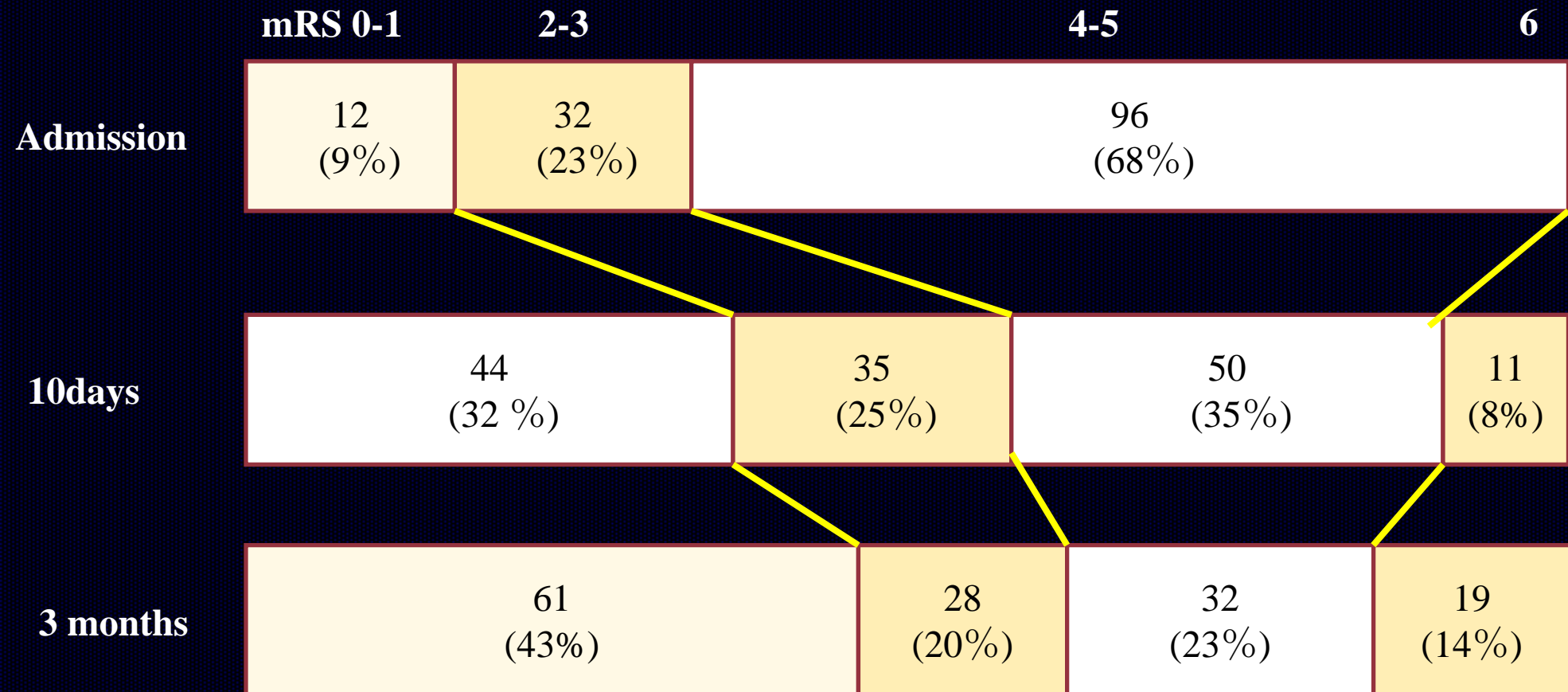


Figure 4. Changes of mRS (overall)



Clinical outcome (mRS) at 3month N=140

Changes of mRS in patients who had intensive rehabilitation (n=83)



Figure 5. Outcome (mRS) at 3 months of patients who went to the Rehabilitation Hospitals from the Emergency Hospital N=83

Table 3.

Predictors of 3-month clinical outcome (mRS) by multiple regression analysis

	t	p
Age	4.972	<0.01
SEX	0.362	0.718
NIHSS on admission	1.972	0.27
NIHSS at 7days	12.736	<0.01

The Age and NIHSS at 7days were significant predictors for 3-month mRS, and the NIHSS at 7 days was the most significant.

Table 4. Compared to the NINDS study

	t-PA group (t-PA for acute ischemic stroke NEJM 1995;333:1581-7)	Control group (t-PA for acute ischemic stroke NEJM 1995;333:1581-7)	Our data
No. of patients	168	165	140
Time to treatment after stroke onset	<3 hours	<3 hours	<3 hours
Diagnostic images	Head CT	Head CT	Head CT+MRI
Recanalization therapy	168(rt-PA i.v)	0(Conservative therapy only)	29(9:rt-PA i.v.)
Small-vessel occlusion	14%	9%	12%
Large-vessel occlusion	39%	45%	23%
Cardio-embogenic	45%	44%	58%
Others	2%	3%	7%

Three months clinical outcome(mRS)

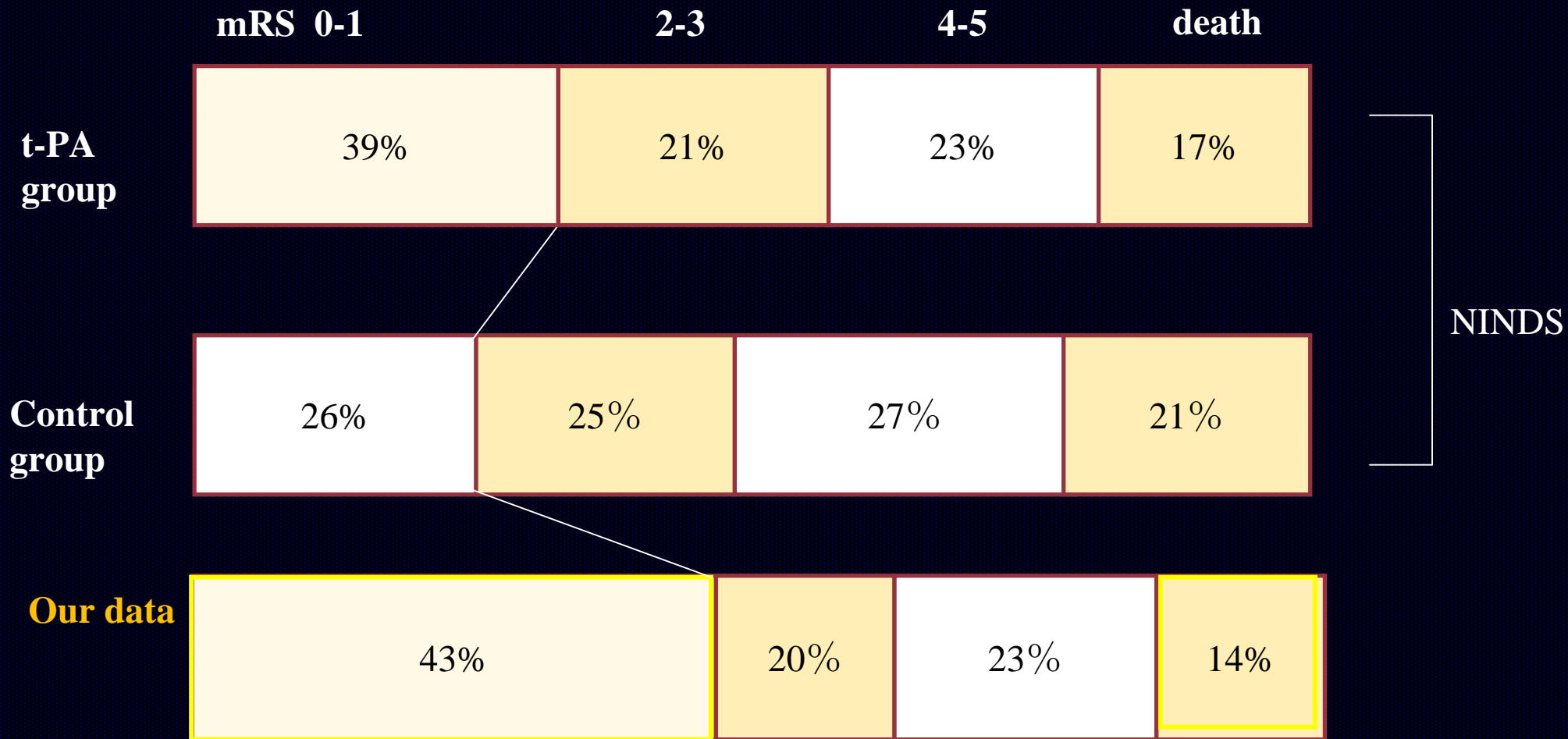


Figure 6. Three months outcome(mRS) compared to the study of rt-PA for acute ischemic stroke NEJM 1995;333:1581-7

Interpretation

Early appropriate therapy immediately after emergency MRI can improve 3-month clinical outcome and decrease 3-month mortality.

CONCLUSION

Early appropriate therapy immediately after emergency MRI improves 7-day neurological symptoms and subsequent intensive rehabilitation improves 3-month clinical outcome. As 7-day NIHSS score is the most significant predictor of 3-month clinical outcome, MRI-based appropriate therapy is important.