partially interrupted. To the best of our knowledge, 2 cases with an infarct located at the paramedian midbrain presented with tetra-ataxia and ophthalmoplegia during the acute phase of the stroke and developed tremor during the acute or chronic phase [9, 10]. The concomitant occurrence of tetra-ataxia and skeletal tremor without oculomotor disorders due to mesencephalic stroke can occur, but it seems to be very rare.

A recent study examining 40 patients with isolated midbrain infarction proposed the existence of a branch atheromatous disease as the operative pathogenic mechanism in more than half of their patients [4]. Our patient's stenosis of the distal basilar artery also suggests that the occlusion of penetrating branches originating from the basilar artery could cause stroke. Spengos et al. [10] highlighted the vascular variation in the uncommon 'top of the basilar' syndrome with both posterior cerebral arteries arising from the corresponding internal carotid arteries as an etiological mechanism of the small bilateral paramedian midbrain infarction with tremor and tetra-ataxia. The fact that the P1-segment of the right posterior cerebral artery was narrow in our patient might also have contributed to the unusual configuration of isolated midbrain infarction.

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Kurashiki Prehospital Stroke Scale

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A prehospital stroke scale should identify stroke patients and measure stroke severity. Our stroke center is located in Kurashiki City, a Japanese city with a population of 460,869. The Kurashiki prehospital stroke scale (KPSS) was developed to assist emergency medical service (EMS) paramedics (table 1). The KPSS was constructed using 4 items, including consciousness level, consciousness disturbance, motor weakness and language. These 4 items were chosen and modified based on the 15 neurological examination test items of the National Institutes of Health Stroke Scale (NIHSS) score. We prospectively studied the correlation between the KPSS as determined by EMS paramedics at the place of stroke onset and the NIHSS score determined by neurologists at the time of the patient's hospital arrival.

Subjects and Methods

Consecutive patients transferred to our stroke center who were evaluated by EMS paramedics using the KPSS from September 2005 to March 2007 were enrolled prospectively. The following clinical data were collected for all patients: (1) patient age and gender; (2) KPSS score evaluated by paramedics; (3) NIHSS score evaluated by neurologists at the time of hospital arrival, and (4) diagnosis (stroke or nonstroke).

Paramedics arrived at the patients' location, and patients suspected of having a stroke were immediately evaluated using the KPSS. Before the patients were transferred to our stroke center, the paramedics called the stroke center's stroke hotline to provide the KPSS score. The NIHSS score was determined by the neurologists when the patients arrived at the hospital. Subsequently, the patients had diagnostic CT or MRI.

Statistical analysis was done using the Statview (version 5) statistical package to establish a correlation between the KPSS score and the NIHSS score using the Spearman rank correlation test. A *p* value of <0.05 was considered significant.

Results

A total of 90 consecutive patients (24 men, 20 women; mean age 71.8 ± 11.0 years) were enrolled in the present study. There were 71 (79%) stroke patients (46 ischemic strokes and 25 hemorrhagic strokes); 19 (21%) patients did not have a stroke. Figure 1 shows the excellent correlation between the KPSS score and the NIHSS score for all patients ($R = 0.827$; $p < 0.0001$) and for the 46 ischemic stroke patients ($R = 0.827$; $p < 0.0001$). Furthermore, if patients with an NIHSS score of 5–22 were considered to be candidates for tissue plasminogen activator therapy, a KPSS score of 3–9 could identify such patients with a sensitivity of 84% and a specificity of 93%.

Fig. 1. The correlation between the KPSS score and the NIHSS score for all patients.

Discussion

Acute stroke therapy is time dependent because intravenous administration of tissue plasminogen activator can improve the clinical outcome [1]. In Japan, 44% of ischemic stroke patients are transported by an EMS ambulance [2]. Improving prehospital care can avoid delays in hospital arrival. Both the Cincinnati Prehospital Stroke Scale [3], the Los Angeles Prehospital Stroke Screen [4] and the Melbourne Ambulance Stroke Screen [5] can identify stroke patients, but they cannot be used to accurately assess stroke severity. Therefore, the KPSS was developed as a stroke severity scale for EMS paramedics. An optimal prehospital stroke scale must be quickly and easily administered by EMS paramedics. It takes approximately 2 min to complete assessment of the 4 KPSS items. We excluded stroke patients from the study who were not assessed by EMS paramedics using the KPSS. Therefore, there was a selection bias in the study. However, the present study found an excellent correlation between the KPSS determined by EMS paramedics and the NIHSS score determined by neurologists. Furthermore, the KPSS score can be used to select candidates for tissue plasminogen activator therapy. The KPSS is a useful prehospital stroke scale that can be used to identify stroke patients and evaluate stroke severity.

Table 1. Kurashiki Prehospital Stroke Scale

Scoring (total disorder: 13 points)			
Consciousness level	Level of consciousness		
	Alert		Normal: 0 point
	Arousable by stimulation		1 point
	No response		2 points
Consciousness disturbance	Ask patient's name		
	Correct		Normal: 0 point
	Incorrect		1 point
Motor weakness (kinetic paralysis)	Ask the patient to close eyes, raise arms to the front with palms down (with gestures)	Right hand	Left hand
		Normal: 0 point	Normal: 0 point
		1 point	1 point
		2 points	2 points
	Instruct the patient to close eyes, raise legs from the bed to the front with gestures	Right leg	Left leg
		Normal: 0 point	Normal: 0 point
		1 point	1 point
		2 points	2 points
Language	Ask the patient to say 'It's fine today' repeatedly		
	Being able to clearly say it repeatedly		Normal: 0 point
	Either unclear (slurred) or abnormal		1 point
	Keeping silence, unable to understand linguistically		2 points
Total			 points

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