

Factors influencing the in-hospital acute stroke management within the “golden hour”

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Background and purpose: Thrombolysis is the best therapy for acute ischemic stroke but the main limitation of its administration is time. In our large geographical area with more than 3 millions of inhabitants, we conducted a project to improve the management of stroke patients, considering pre- and in-hospital delays. Aim of this analysis was the estimation of single factors reaching the “golden hour”.

Material and methods: All consecutive patients admitted to 11 Hospitals in Northern Italy for stroke were enrolled during a 6 months period. Demographical data, time of single steps of stroke pathway and treatment procedures were registered for each patients. Structural settings for each hospitals were also collected. Statistical analysis was conducted using t-test and chi-square test for univariate and logistic regression for multivariate analysis. We considered the optimal in-hospital management times as reported by the NIH: door-to-neurologist evaluation as less than 15 minutes, door-to-CT scan less than 25 minutes and finally door-to-treatment less than 60 minutes.

Results: 1032 patients were analysed (Median age: 78 years; female: 52.8%; NIHSS: 6). Median door-to-treatment, door-to-CT scan and door-to-neurologist evaluation times were 111, 107 and 72 minutes, respectively. Patients were mainly admitted to hospitals during daytime (71.4%) and using EMS (54.5%). An acute treatment (thrombolysis and/or thrombectomy) was performed in 49 patients (4.7%). An optimal door-to-treatment time within the “golden hour” was registered in only 215 subjects (20.8%). At univariate analysis age, hospital setting, clinical severity at admission and high urgency codes at transport and triage showed significant correlations with this temporal management target of less than one hour ($p < 0.05$). At multivariate analysis age and clinical severity remained significantly associated with this management outcome, as well as high urgency code at triage (OR: 1.726; 95%CI: 1.134 – 2.629; $p : 0.011$) (Fig. 2).

Conclusion: Despite some attempts to improve the acute stroke management pathway, temporal delays remain higher than in other similar time-dependent diseases. In this analysis we observed that age and clinical severity contributed significantly to reduce the in-hospital delays. At the same time, the application of high urgency codes at triage seemed to be effective to reach the actual temporal recommendations in the acute stroke treatment. The spreading of the high urgency code use at triage could contribute to increase the number of patients promptly treated with the concomitant potential administration of thrombolytic therapy.

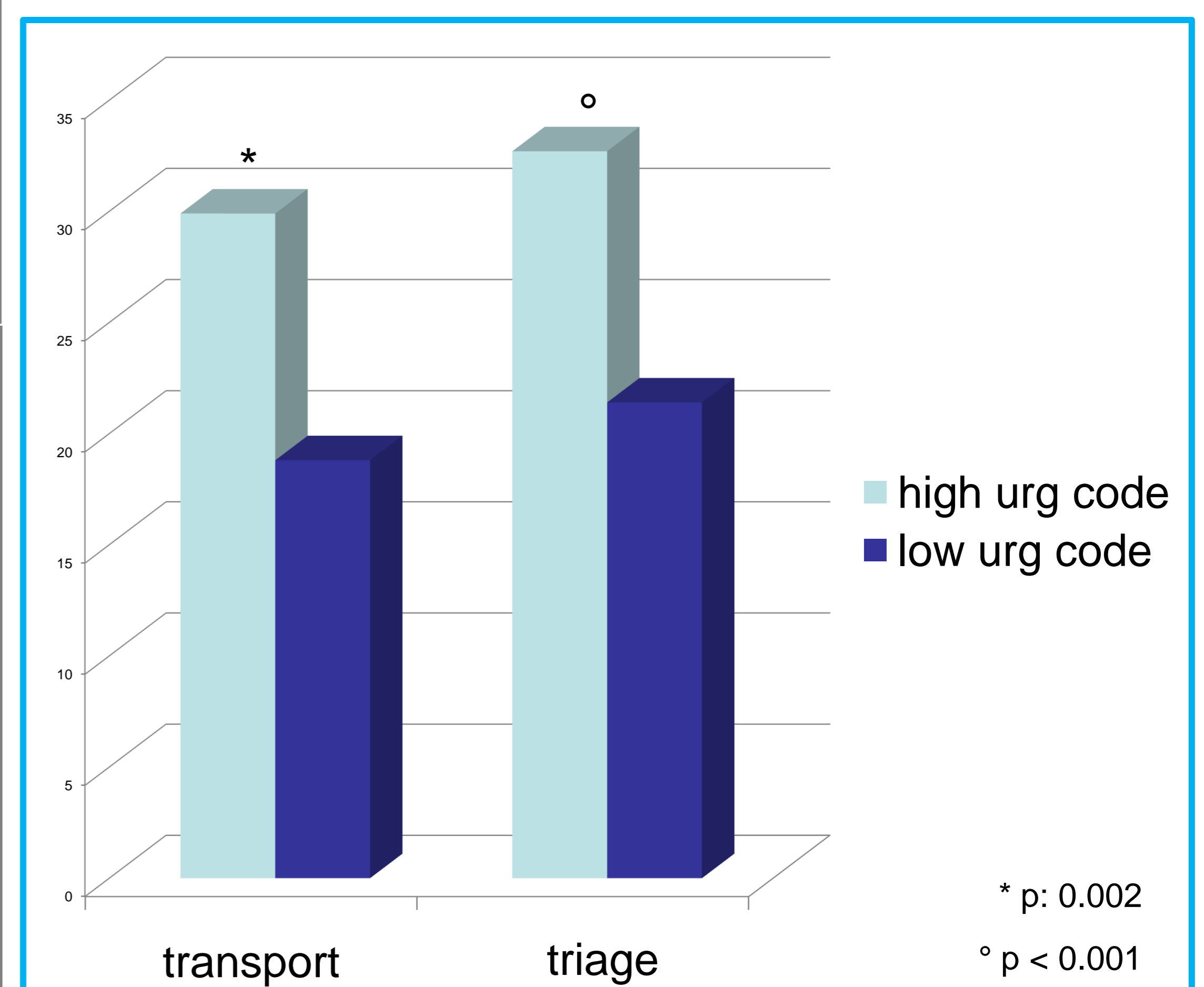


Figure 1

Variable	OR	95%CI	p
Age	0.972	0.957 – 0.987	< 0.001
NIH admission	1.027	1.002 – 1.054	0.037
Triage Code	1.726	1.134 – 2.629	0.011

Figure 2