# COMPARISON OF EMERGENCY MEDICAL SERVICE STROKE IDENTIFICATION AND NEUROLOGIST IN-HOSPITAL STROKE ASSESSMENT: PRELIMINARY RESULTS OF THE GENOVA NETWORK

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## INTRODUCTION

The main objective of this study is to compare emergency medical dispatch (EMD) stroke identification with hospital-confirmed stroke. The secondary objective is to compare the results of stroke diagnostic tool (SDxT) of Medical Priority Dispatch System™ (MPDS®) with National Institutes of Health Stroke Scale (NIHSS) used in hospital by neurologists.

## METHODS

Data utilized for the observational study were taken from a preliminary stroke dataset collected at San Martino Hospital (Genova) between January 2016 and June 2017. All cases of suspected stroke arrived at First Aid of San Martino Hospital began part of the study. The dataset includes pre-hospital and in-hospital information: time of call, chief complaint, level of evidence of SDxT, onset, time of arrival at the hospital, confirmation of the stroke by the neurologist, NIH upon arrival and other information and other information on the patient's in-hospital route. At the time of collection information MPDS® 12.1 version was used. EMS of Genova (Italy) isn't ACE center and the calls included in the study have not been reviewed. The Stroke Genova Network is summarized schematically in Figure 1.

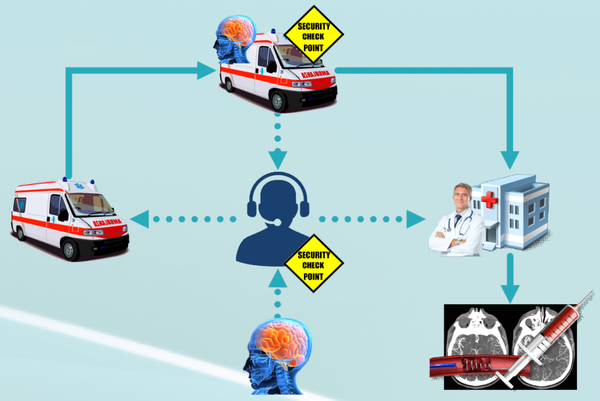



Figure 1

### The Stroke Genova Network and the new perspectives:

The Stroke Genova Network consists of a first telephone "check point" made using MPDS. When the rescuers are with the patient they perform the Cincinnati Stroke Scale and if even this second "check point" is positive, during the time of transport to the hospital, the EMCC activates the "Stroke Team" telfonically communicating: sex and age of the patient, presumed time of onset of symptoms and estimated time of arrival. In our network 4 hospitals can receive patients with suspected stroke (San Martino, Galliera, Villa Scassi and Lavagna). Find a correlation between SDxT and NIHSS is very important because, with high probability (Heldner, Stroke 2013; Cooray C. Int. J. Stroke 2015), the patients with NIHSS > 10 must be subjected to mechanical thrombectomy and, in our situation, only a hospital (San Martino) can do this type of therapy: detect, during the emergency call using SDxT, the patients with probable NIHSS > 10 would allow us to send the patient to the only hospital capable of providing the best therapy saving time and brain.

Figure 2

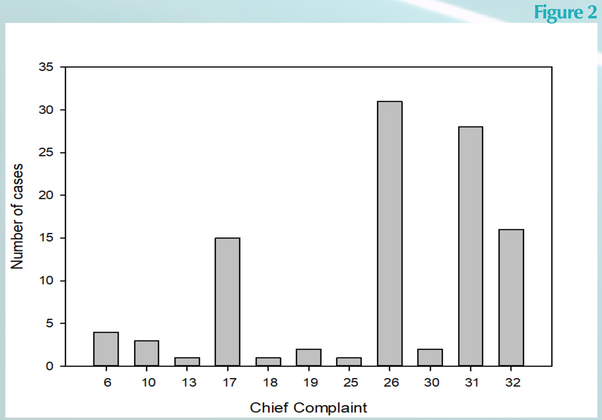
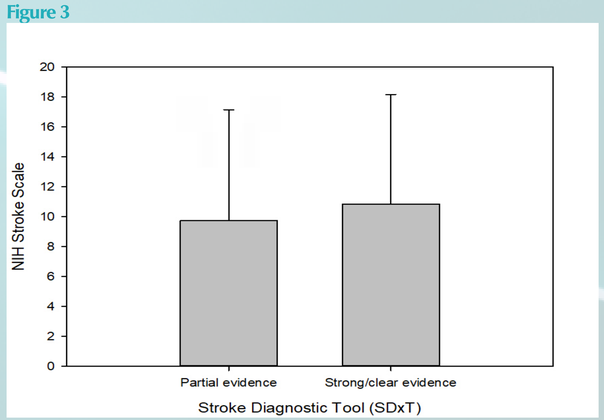



Figure 3




## RESULTS

From 438 suspected stroke included in registry, 353 cases (80.6%) called the EMS. The patients who called EMS had an initial NIH of 10.9 (5.3 for self-presentation at first aid, 14.9 for for transfers from another hospital). From these, 205 (58.1%) were identified by the EMD as suspected stroke; in the remaining 106 cases (Fig.2) the suspicion of stroke was posed by ambulance rescuers (in 42 cases the Chief Complaint was missing at dispatch). SDxT was used in 129 cases: 5 no evidence, 87 partial evidence, 5 strong evidence and 32 clear evidence; in 76 cases SDxT has not been used or completed. The onset was classified as follows: less than 4 hours 114 cases (55.6%), between 4 and 6 hours 8 cases (3.9%), more than 6 hours 18 cases (8.8%), unknown 65 cases (31.7%). Matching this information 46.5% of patients has a partial evidence of stroke and an onset of less than 4 hours. The neurologist at the hospital confirmed 234 cases out of 311 (75.3%): of these 91.0% (n=213) was ischemic and 8.0% (n=21) was hemorrhagic. The NIHSS was related to the SDxT: there were no significant results comparing groups with partial evidence versus strong/clear evidence (NIH score (95%CI): 9.73(7.43 – 12.03) vs 10.85 (7.33 – 14.36), respectively) (Fig.3). Furthermore, the time between the onset of symptoms and the first contact with the neurologist is significantly lower when EMS is activated (139.3 vs 188.3; p = 0,004).

## DISCUSSION

The results show a good ability of EMDs to identify stroke patients. Nonetheless, the results obtained demonstrate the key role in the "face to face" evaluation of rescuers.
It's interesting, and in accordance with what was noted by I. Gardett et al. (2017, Annals of Emergency Dispatch & Response), which falls (17), sick person (26) and unconscius /fainting (31) are the most used chief complaints in patients with unidentified stroke during the call. In addition, access to the hospital via EMS guarantees an improvement of the first neurological contact and, presumably, also access to definitive therapies.

## CONCLUSION

The correlation between SDxT and NIHSS would seem to be useful for telephone screening of patients with NIHSS> = 10 but this study is inconclusive for this topic.

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