

## INFLUENCE OF RECORDING TIME ON MICRO-EMBOLIC SIGNAL (MES) DETECTION BY MEANS OF TRANSCRANIAL DOPPLER IN ACUTE STROKE PATIENTS: TCDX VERSUS STANDARD RECORDING.

L. Piccolo<sup>1,2</sup>, H. Müller<sup>1</sup>, G. Toledo Sotomayor<sup>1</sup>, R. Sztajzel<sup>1</sup>

<sup>1</sup>Department of Clinical Neurosciences, Vascular Neurology Unit, Geneva University Hospital, Geneva, Switzerland

<sup>2</sup>Department of Bio-Medical and Specialized Surgical Sciences, Section of Neurology, Ferrara University, Ferrara, Italy

### Background:

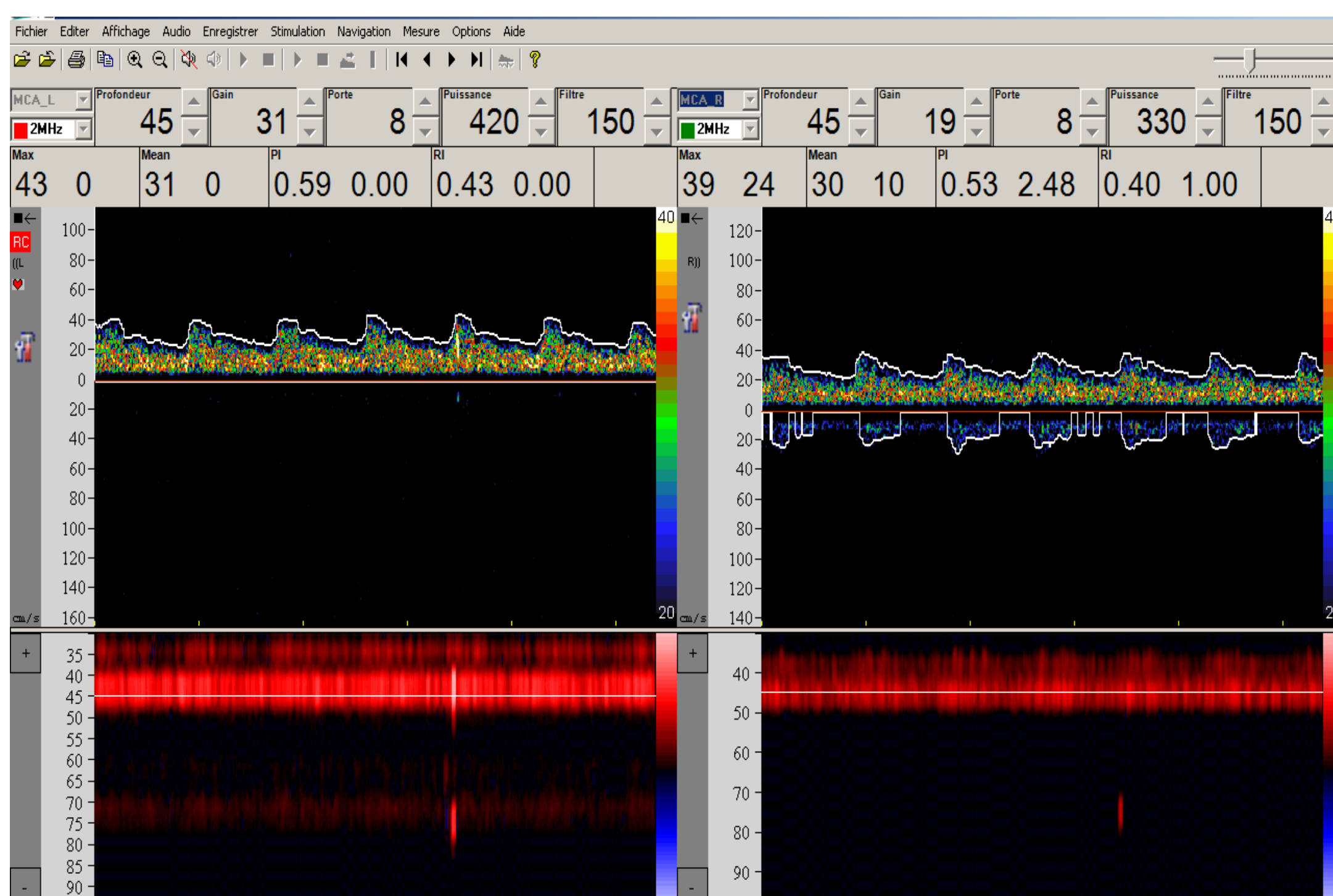
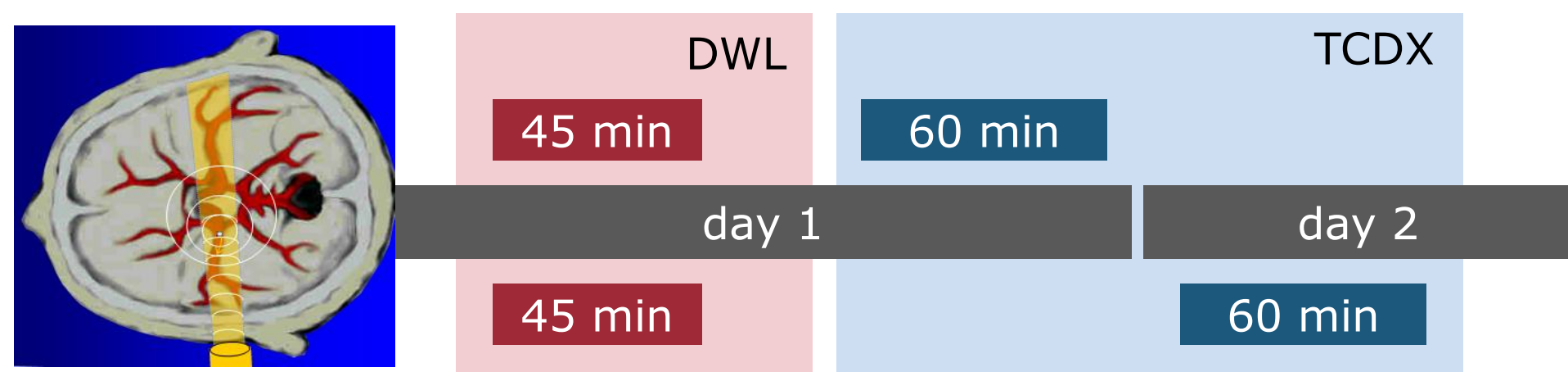
previous studies reported a low prevalence of micro-embolic signals (MES) among acute stroke patients, with an overall low sensitivity (31%) and a good specificity (95%). Also, it has been demonstrated that a reduction of the time interval between symptoms onset and MES recording was associated with a higher prevalence of MES positive patients. As embolization typically occurs in cluster, it is likely that serial examinations and a longer duration of the recording could increase sensitivity as well.

### Aims:

to evaluate how examination duration influences the prevalence of MES-positivity in non-selected acute stroke/TIA patients and to compare a new TCDX system, allowing a longer recording time, with the standard method using a DWL (TCD) machine.

### Materials and Methods:

we performed three sequential recordings of Doppler signal of the Middle Cerebral Artery (depth: 45-55 mm): a 45 minutes bilateral recording by means of the standard machine (DWL) and two 60 minutes unilateral recordings (one for each side) using the not jet validated TCDX.



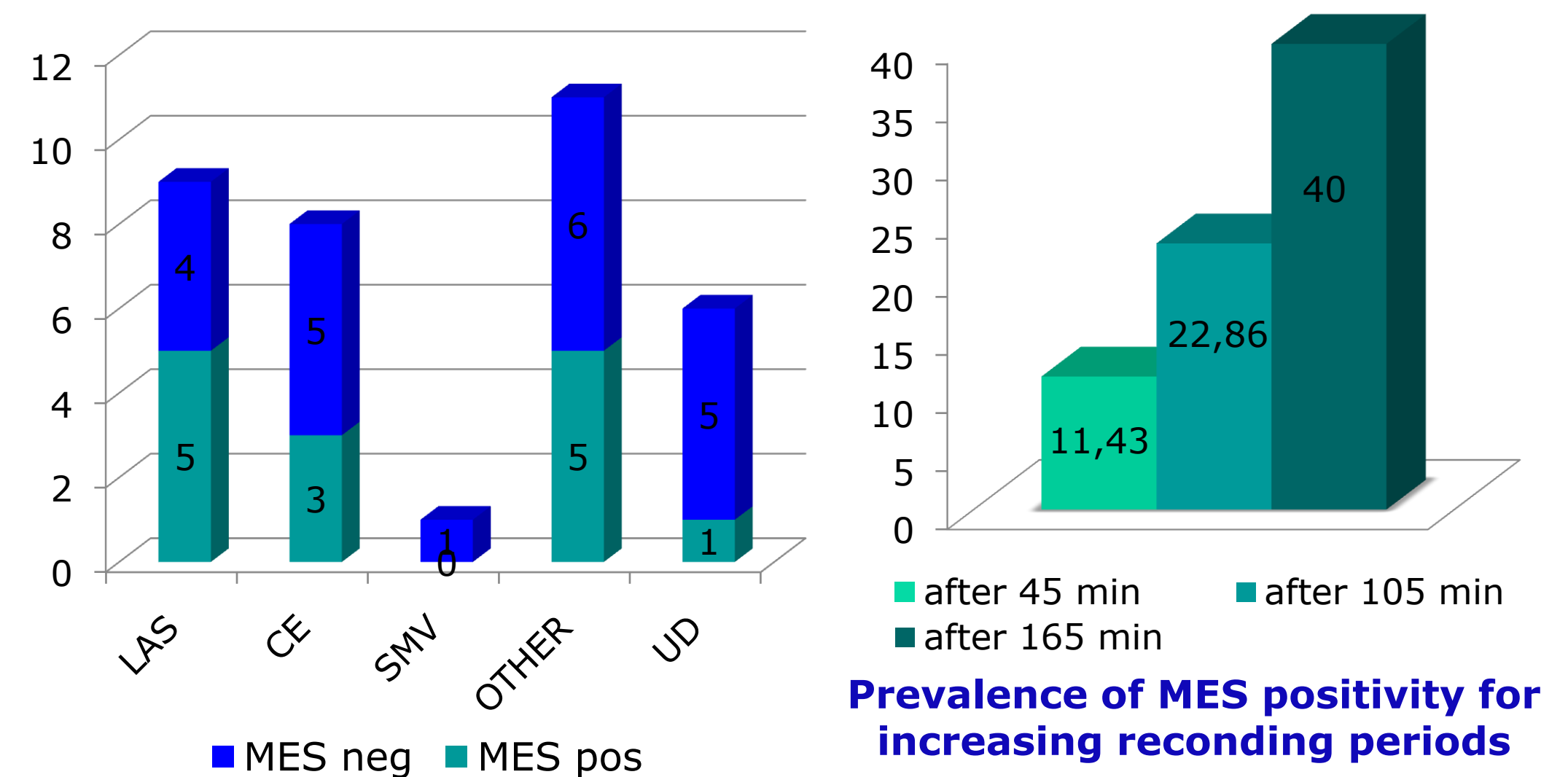
### Discussion:

our study identified a high prevalence of MES in acute stroke/TIA patients (among the highest reported in Literature since the introduction of International Consensus Criteria on MES detection). This result is likely due to the short latency between stroke onset and the beginning of TCD examination as well as to the long overall duration of recording. In 2 TCDX-positive/standard-negative cases TCDX recording preceded the standard one, which was however done within the same day, excluding an influence of treatment modifications or biohumoral changes on MES detection.

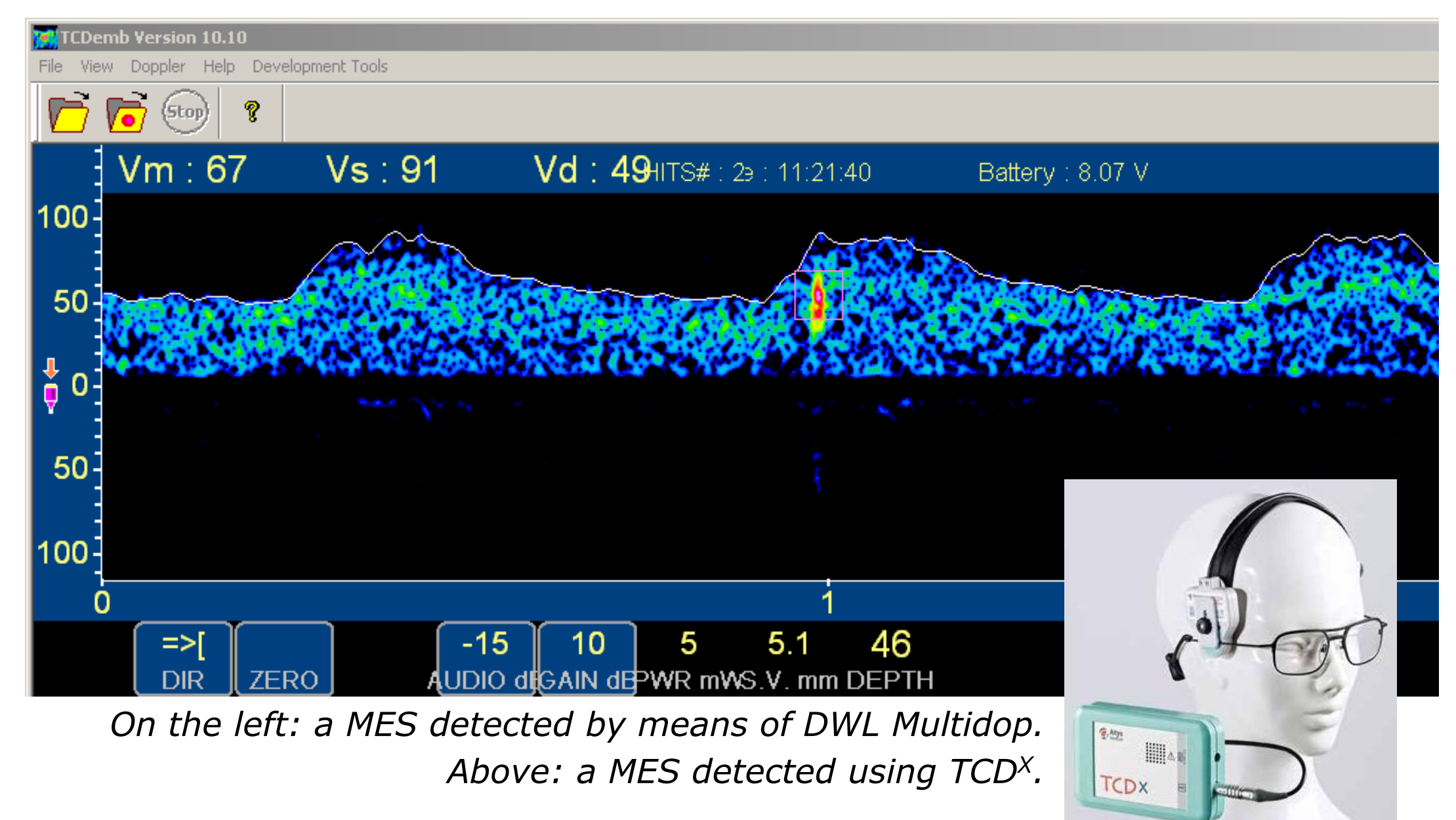
### Results:

we included 35 patients and found a 40% overall prevalence of MES-positivity (14 patients). Recordings were started 49 (SD: 33) hours after stroke onset. The percentage of MES-positive patients at the first recording was 11.4%; it increased to 22.8% after the second (105 minutes) and arrived to 40% at the end of the whole 165 minutes of recording. In 2 cases the detection was positive during both standard and TCDX examination; the other positive cases were detected by TCDX only (85.7%).

	MES pos n=14 (%)	MES neg n=21 (%)	p
Age ≥ 65 aa	7 (50)	9 (42.86)	0.678
Gender M, n (%)	8 (57.14)	15 (71.43)	0.383
NIHSS ≥ 5	3 (21.43)	1 (4.76)	0.129
Hypertension, n (%)	7 (50)	10 (47.62)	0.890
Diabetes, n (%)	0 (0)	2 (9.52)	0.234
Hypercholesterolemia, n (%)	3 (21.43)	9 (42.86)	0.191
Smoke, n (%)	1 (7.14)	6 (28.57)	0.121
Previous stroke/TIA, n (%)	5 (35.71)	3 (14.29)	0.139
AF, n (%)	2 (14.29)	1 (4.76)	0.324
Ischemic cardiopathy, n (%)	1 (7.14)	1 (4.76)	0.766
OSAS	1 (7.14)	2 (9.52)	0.805
<b>Embolic ethiology, n (%)</b>	<b>14 (100)</b>	<b>14 (66.67)</b>	<b>0.016</b>



Prevalence of MES positivity for increasing recording periods



On the left: a MES detected by means of DWL Multidop. Above: a MES detected using TCDx.

### Conclusions:

transcranial-Doppler sensitivity for MES detection improved with the augmentation of recording time. TCDX demonstrated itself to be not inferior to the conventional system in detecting MES; it was more easily tolerated for long-lasting recordings and less prone to displacement. More extensive studies and larger number of patients are needed in order to confirm this preliminary result.

### References:

- Ringelstein BE. et al. Stroke 1998; 29:725
- Idicula T.T. et al. BMC Neurology 2010; 63:784
- Serena J. et al. Cerebrovasc Dis 2000; 10:278