and attention deficiencies, and auditive and olfactive abnormalities [4,9-11].

In a previous study we showed that EHS and/or MCS bearing patients may present with a significant decrease in mean PI in several tissue areas of temporal lobes, suggesting these abnormalities may correspond to some decrease in brain blood flow (BBF) and/or neuronal dysfunction [4,12].

The present study aims at confirming and extending our previous data by showing UCTs is a well-tolerated non-invasive ultrasound-based technique which can be used routinely in addition to other ultrasound-based imaging techniques such as transcranial Doppler ultrasonography (TDU), and peripheral blood biomarker measurement; to fully identify and characterize EHS and so contribute to the objective diagnosis of this new pathological condition occurring in EHS-self reporting patients, whether it is or not associated with MCS.

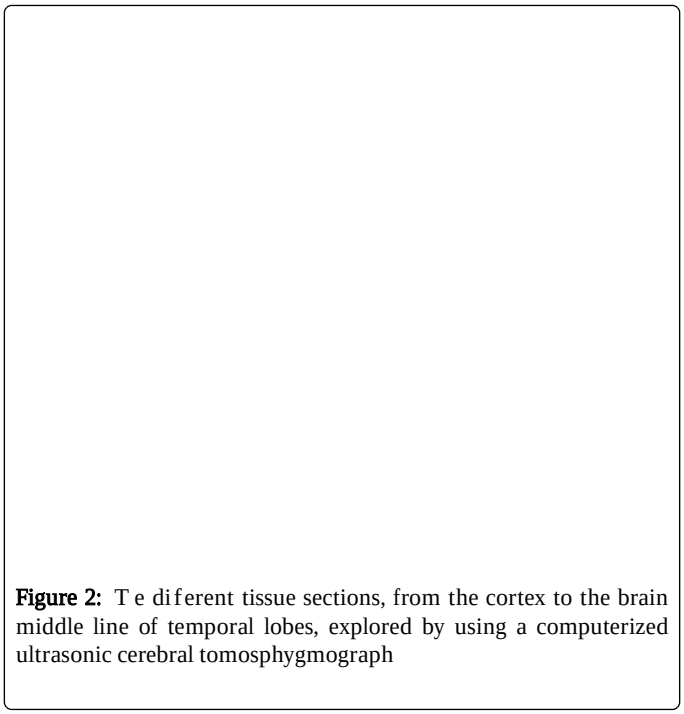

Figure 2: T e di ferent tissue sections, from the cortex to the brain middle line of temporal lobes, explored by using a computerized ultrasonic cerebral tomosphygmograph

Comparison to normal controls

Comparison between the mean tissue PI values obtained in the investigated EHS and EHS/MCS patients and the mean tissue PI values obtained in the apparently healthy subjects used as normal concomitant controls was done using the two tailed student t-test. Also the comparison between the EHS and the EHS/MCS groups of patient was done using the two tailed student t-test.

T is allowed us to show that in comparison with normal subjects, the MCA-dependent tissue pulsatility in temporal lobes of EHS- or EHS/MCS-self-reporting patients is decreased or even abolished in several areas, more particularly in the capsulo-thalamic area, in one or the two temporal lobes, suggesting that in these areas, decrease in BBF and/or neuronal metabolic dysfunction may have occurred.

Results

Demographic data

areas, meaning that the cut-of number being established at 3, the percentage of patients with a pathological UCTS scan in comparison with normal controls is estimated to be 84%, whether EHS is associated or not with MCS (Figure 3).

Temporal lobe	Tissue areas analyzed	Apparently healthy subjects n=84	EHS patients n=353	p**	EHS-MCS patients n=182	p***
	carotidian	20.39 ± 4.33	13.48 ± 3.76	<0.00001	13.44 ± 3.62	<0.00001
	cortical-subcortical	6.02 ± 2.90	5.28 ± 2.92	0.12		
Right						

So, the statistically significant decrease in mean tissue PI values evidenced in the MCA-dependent areas of temporal lobes may similarly be associated with some brain tissue metabolic changes in the limbic system and the nearby brain connected neuronal structures. Such pathological changes could indeed be related to oxidative stress-induced BBB opening [26] and/or to brain hypoxia caused by EMF-induced BBF decrease and/or EMF-induced haemoglobin deoxygenation [27,28].

In the present study, all patients who have been investigated before inclusion with a brain MRI or CT scan had a normal MRI or CT scan, so abnormalities in the limbic system and/or in the thalamus could not be detected by using these classical EMF-related routinely used imaging techniques to characterize and diagnose EHS. However by