Midbrain Sonography in Parkinson's Disease: Further Evidence of a Different Etiopathogenesis of Alexithymia and Depression.

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**Background and Objective:** Parkinson's disease (PD) is often characterized by altered emotional processing, such as depression (prevalence of 30-35% in levodopa treated PD patients) and alexithymia (prevalence of 21% in PD patients). Salient features of alexithymia are the inability to distinguish one's feelings from the accompanying bodily sensations with a tendency to amplify the somatic sensations accompanying emotional arousal, the inability to communicate feelings to others and an externally oriented cognitive style reflecting an absence of inner thoughts (1). Alexithymic and depressive symptoms may be partially overlapping, and the relative independence of the two disorders is strongly debated.

Reduced echogenicity of midbrain raphe, evaluated with transcranial sonography (TCS), is a characteristic finding in depression associated with Parkinson's disease (2).

No data are available on brainstem's echogenicity in alexithymic patients. We assessed, by means of transcranial sonography, possible differences between PD patient with or without alexithymia and/or depression.

**Materials and methods:** We recruited 22 PD patients among local cohort of 200 patients referred to our institution during 2014. All patients were treated with optimal dose of dopaminomimetic (L-DOPA 300-750mg) and they underwent neuropsychological tests: Mini Mental State Examination (MMSE, exclusion criteria MMSE<25), Beck Depression Inventory (BDI), Toronto Alexithymia Scale-20 (TAS-20), Symptom Checklist 90-R (SCL-90-R). Motor symptoms were assessed with Unified Parkinson's Disease Rating Scale (UPDRS III) and modified Hoehn and Yahr scale (H&Y).

TCS was performed, through temporal window, using a color-coded phased-array ultrasound system (SONOS 7500), to evaluate midbrain raphe (0=absent, 1=discontinuous, 2=continuous) (examples of absent and continuous raphe Fig. A,B,C,D).

**Results and Conclusions:** This study evidenced the presence of hypoechochogenicity in the midbrain raphe in PD patient with depression; hypoechochogenicity correlated with BDI score (r=-0.6227, p-value=0.0012). No alteration of midbrain raphe was found in PD patient with alexithymia. TAS-20 did not correlate with hypoechochogenicity of raphe (r=-0.172, p-value=0.4441) (Pearson's correlation) (tab. 1-2).

These findings may suggest that white depression in PD may involve central component of brainstem midline, constituting the basal limbic system, called meso-cortico-limbic pathway, alteration in alexithymia does not interest midbrain and it may involve cortical disfunction (3). This pilot study will lead to a larger number of patients to produce further evidence that depression and alexithymia are independent affective disorder.

**References:**
2-Berg D et al. Depression in Parkinson's disease: brainstem midline alteration on transcranial sonography and magnetic resonance imaging. J Neurol 1999b;246:1186-93