The relationship between Obstructive Sleep Apnea (OSA) and Major depressive disorder (MDD) is complex which may share neurological risk factors. Arousal (Ar) from sleep is an important mechanism for reestablishing upper airway patency in OSA. When EEG frequency changes are not seen at event termination by visible cortical arousals but accompanied by sudden drop in pulse transit time (PTT), those are known as autonomic arousals. Therefore, the aim of this study is to look at if there is any difference of arousal patterns in polysomnography (PSG) and PTT recordings in OSA patients with MDD and without MDD subjects.

Nine overnight PSG recordings (7~8 hours) were acquired from OSA subjects (AHI: 15~60; 36.68±13.55 events/hour) with MDD diagnoses [OSAMDD] (5 cases) and OSA subjects (AHI: 15~60; 38.37±19.61) without MDD [OSA] (4 cases) from a local psychiatric clinic. Selection criteria include the age [39.5±5 vs 41.4±3.5 yrs; p>0.05] and weight [120.2±10 vs 118.6±12 Kgs; p>0.05] matched subjects. Diagnoses of MDD were made by the Mini-International Neuropsychiatric Interview with ICD-10 questionnaire.

PTT was measured from R wave on the ECG trace to the arrival of the pulse waveform taken as 50% of the maximum value of Photo-plethysmogram. A PTT arousal (ArPTT) was defined as a decrease in PTT by at least 15 milliseconds of the baseline lasting at least 5 seconds. Expert scored EEG based cortical arousals (ArEEG) include respiratory, movement, periodic leg movement and spontaneous arousals. Mann-Whitney U test showed that ArPTT index (events per hour) of OSAMDD was significantly (p<0.05) higher than that of OSA groups [36.56±5.6 vs 28.78±4.6]. In contrast, ArEEG indices in both groups were not found significantly different [24.18±6.7 vs 25.74±8.3].

We reported the possible association of ArPTT with diagnosis of MDD. However, understanding the neurobiological mechanism of autonomic arousal and serotonergic pathways needs further study.