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REM theta activity predicts stress adaptation after experimental trauma

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Intrusive memories developed after trauma are thought to rely on an insufficient memory integration of the event hampering its adaptive consolidation. Sleep plays an essential role in the processing and integration of emotional memories, but at the same time is often disturbed after trauma. Recent evidence found a correlative link between sleep disturbances and posttraumatic symptoms. The underlying neurophysiological mechanisms of this link are poorly understood. Here, we investigated (i) how an experimental trauma (i.e. a traumatic film) influences sleep architecture and EEG oscillatory activity and (ii) how trauma film induced changes of oscillatory activity may influence intrusion development. We found prolonged sleep latency and a slower initial increase in slow wave activity (SWA; 0.5-4 Hz) after the trauma film compared to a neutral film condition. Increased theta activity during REM sleep after the trauma film was associated with less intrusive reexperiencing during the following week. Our results point out an important role of theta activity in stress adaptation that is consistent with previous studies suggesting theta activity as a driver for affective depotentiation.

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