TOP-DOWN ATTENTION PROCESSES CAN INITIAL DISTRESS CLINICAL TINNITUS VIA NEUTRAL AUDITORY PHANTOM

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Subjective tinnitus is a perception of a sound in the absence of external source and can be classified as an auditory phantom. Current models condition, or at least emphasize, the role of external events congruently paired with the causal physical event that originated the phantom perception. Our suggesting for explaining negative symptoms related to tinnitus is based on top-down cognitive processes. Integrating behavioral, neuroanatomical and neurofuncional research results, we propose a detailed neurofunctional model whose main structural components are the peripheral auditory system, the thalamus (reticular, medial geniculate and dorsal nuclei), the limbic system (hippocampus, anterior cingulate cortex, amygdala), brain stem (raphe nucleus), basal ganglia (ventral palladium), striatum (nucleus accumbens), and the auditory and prefrontal cortices. Functionally, we assume continuous or abnormal signal at the peripheral auditory system. The signal might be perceived or not, depending on availability of attentional valuation and resources. Negative cognitive values of cortical top-down processes weaken the noise canceling effect and the abnormal signal being considered a relevant stimulus. . The consequences are an increase of cognitive and emotional negative reactions, such as depression, observed in part of the tinnitus patients. Negative or positive top-down feedback can be independent of previous experience or association with stimuli similar in nature to the abnormal neural activity that generated the phantom auditory perception. It depends on general personality biases toward negative cognitive interpretation of stimuli, such as the case of people that present hypochondria, generalized anxiety syndrome and/or depression symptoms We present empirical evidence from studies using neuroimaging, electrophysiology, brain lesion and behavioral techniques to support the model. This model represents an advance in our understanding of clinically-significant tinnitus symptoms and might eventually help to improve current treatments.