Music and the brain (SOFMER-INSERM-CNRS)

Oral communications

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Cognitive, emotional, and neural benefits of musical leisure activities in stroke and dementia
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Introduction The capacity of music to engage auditory, cognitive, motor, and emotional functions across cortical and subcortical brain regions and the relative preservation of music in ageing and dementia makes it a promising tool in the rehabilitation of age-related neurological illnesses, such as stroke and Alzheimer’s disease. As the incidence and prevalence of these illnesses is increasing rapidly, it is important to develop music-based interventions that are enjoyable and effective in the everyday care of the patients.

Methods In two single-blind RCTs, the cognitive, emotional, and neural efficacy of self- or caregiver-implemented musical leisure activities was studied in stroke patients (n = 60) and persons with dementia (PWDs, n = 89). In stroke patients, daily music listening was compared to audio book listening and standard rehabilitation. In PWDs, regular listening and singing of familiar songs were compared to standard care.

Results Original results showed that music listening enhanced the recovery of memory, attention, and mood after stroke [1] and that both singing and music listening helped maintain better cognitive functioning and mood in PWDs [2]. Here, we will present recent results from voxel-based morphometry (VBM) analyses showing that the cognitive and emotional benefits of music listening after stroke are associated with structural neuroplasticity in a network of prefrontal and limbic regions [3]. We will also present new results on how different clinical and demographical factors influence the outcome of the music interventions in PWDs.

Discussion Musical leisure activities can provide an effective and easily applicable to enhance cognitive and emotional well-being after stroke and in the early stage of dementia.

Key words Music; Listening; Singing; Stroke; Dementia; Alzheimer; Neuropsychology; Emotion

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References

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Verbal and musical memory: Selectivity of auditory disorders after stroke
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Introduction Neuropsychological consequences of stroke have important social, professional, and private life impacts. Deficits affecting language processing are well documented unlike musical disorders. Yet, according to Sarkamo et al. (Neuropsychologia, 2009), the incidence of acquired amusia after stroke is 60% after a delay of one week and 42% after 3 months.

The goal of this study is to compare verbal and musical auditory memory in patients with stroke history, using a short-term memory paradigm. The goal is to evaluate the interest of testing non-verbal memory in neuropsychological assessment after stroke, as it could guide the choice of reeducation methods.

Material and methods Patients included in the study have been hospitalized in the stroke unit of the neurological hospital in Lyon for a stroke in the MCA (middle cerebral artery) territory. Several months after stroke, they were assessed with a test battery including cognitive evaluation, speech evaluation and audiometry. Acquired amusia was diagnosed with the MBEA (Montreal Battery of Evaluation of Amusia, Peretz et al., Ann N Y Acad Sci, 2003). The auditory musical and verbal short-term memory was tested with a paradigm involving a comparison of short word sequences or tone sequences, separated by a delay of 1000 ms.

Results Performance in the auditory short-term memory task were significantly decreased for the verbal task in patients with left hemisphere lesions, and for the musical task in patients with right hemisphere lesions, in comparison with controls.

References

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