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Stress proteins and circulating miRNAs as biomarkers of hippocampal remodelling in drug-resistant temporal lobe epilepsy (DR-TLE)

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Among the mediators of stress response, Heat Shock Proteins (HSPs) play essential roles in cell survival, protein folding, trafficking and degradation [1]. In particular, HSPs alterations were associated with temporal lobe epilepsy (TLE) [2] and recently, specific microRNAs (miRNA) have been proposed as regulators of HSPs expression [3].

The significance of HSP60 in hippocampus, derived from patients affected by drug resistant TLE with hippocampal sclerosis and associated controls, was investigated by immunohistochemistry while circulating levels of this protein were detected by ELISA test. qRT-PCR was used to evaluate the expression levels of HSP60 and associated miRNA such as miR1 and miR206 in hippocampus. Moreover, miR-8071, miR-663, miR-146a and miR-124 expression levels associated with clinical features of TLE were also investigated. Our findings show that HSP60 is localized inside neurons somata and neuropil. Hsp60 expression levels were correlated to those of miR1 and miR206. Moreover, plasma Hsp60 levels in patients were higher than those of controls. Finally, circulating levels of miR-8071, miR-663, miR-146a and miR-124 decreased in TLE patients and were correlated to neuroinflammation and seizure recurrences.

Our work suggests that Hsp60 and associated miRNA levels are altered in relation to epileptogenesis and disease progression and may serve as a target for new therapeutic approaches in the management of TLE patients.

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References

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Key words

Epilepsy, microRNA, molecular chaperones.