戊四唑誘發癲癇反應與發炎基因表現

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摘要

癲癇為世界上常見的神經失常疾病，罹病率約佔整體人口 0.5-1 的百分比，其主要是因乃大腦神經元一連串不正常放電所致。近年來已有些證據指出，大腦處在長期或慢性發炎之際，更容易誘發出此癲癇的病症，因此探討癲癇產生大腦皮質是否發炎相關基因的表現會增加，便是刻不容緩的議題。本研究便是以化學物戊四唑誘發雄性小鼠產生癲癇之適當的劑量，並進一步以反轉錄定量聚合連鎖反應法探討大腦皮質組織之細胞激素介白素-1 貝他的基因表現量。結果發現較高劑量的戊四唑注射後，實驗動物的癲癇行為表現指數便增加，以及 8 小時後之大腦皮質區域的介白素-1 貝他的基因表現量亦表達增加，並且呈現劑量依賴現象。其次給予卡巴馬平此抗癲癇藥物後，可降低戊四唑誘發癲癇的反應指數，以及介白素-1 貝他的基因表現增加情形，然而此抑制現象僅出現在高劑量戊四唑誘發較強的癲癇反應之際，但對低劑量戊四唑的作用並不明顯。因此這些結果證實戊四唑誘發實驗動物的癲癇反應與大腦皮質的介白素-1 貝他基因表現量改變具相關性。

關鍵詞：大腦、神經發炎、介白素-1、抗癲癇藥物、小鼠

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Effects of pentylenetetrazole induced seizure and inflammatory genes expression

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Abstract

Epilepsy is a common neural disorder throughout the world affecting about 0.5-1% of the population, is characterized by an enduring predisposition to generate seizures due to a chronically low seizure threshold, resulting in spontaneous, recurrent seizures. Recently there has been increasing interest in the role of inflammation in the pathogenesis of epilepsy. Therefore, it is an urge to investigate whether the levels of inflammatory cytokine genes expression, such as interleukin-1β (IL-1β), were increased after seizure. The present study aims to establish the optimal doses of pentylenetetrazole (PTZ)-induced seizure responses in male mice, and then to determine the gene expressions of IL-1β by reverse transcription quantitative PCR. Higher doses of PTZ induced higher behavioral changes in seizure score and elevated the levels of IL-1β mRNA expressions in cortex as well as these exhibited dose-responses. Furthermore, anticonvulsant, carbamazepin (CBZ), decreased both the seizure score and the levels of IL-1β gene expressions in PTZ-induced seizure responses in higher dose, but not in lower one of PTZ treatment. These data clarified the issue of the previous studies by demonstrating that expression levels of inflammatory cytokine IL-1β genes are influenced by PTZ-induced seizure conditions. IL-1β might be responsible for the predisposition or cause of seizure related brain injury.

Keywords：brain, neuroinflammation, interleukin-1, anticonvulsant, mice