

INDIVIDUALS WITH SICKLE CELL DISEASE AND CHRONIC PAIN DISPLAY INCREASED DELTA AND THETA EEG POWER DENSITY AT REST

Autores

Tiago da Silva Lopes (1,2), Marjorie Rodrigues Xavier Reis (1), Jamille Evelyn R. S. Santana (1), Wellington dos Santos Silva (1,3), Sanzia Bezerra Ribeiro (1,3) Fernanda Costa Queiros (1) e Abrahão Fontes Baptista (1,2).

Afiliação

(1) Núcleo de Estudos em Saúde e Funcionalidade, Instituto de Ciências da Saúde, Universidade Federal da Bahia, Salvador, BA; (2) Programa de Pós-graduação em Medicina e Saúde, Faculdade de Medicina, Universidade Federal da Bahia, Salvador, BA; (3) Curso de Fisioterapia, Faculdade Adventista da Bahia, Cachoeira, BA

Introduction: Chronic pain due to musculoskeletal injury is associated with altered electroencephalography (EEG) power density, but it has not yet been shown if this is the case in individuals with sickle cell disease (SCD) and associated chronic pain (CP) due to hip osteonecrosis. **Objectives:** Characterize EEG activity in individuals with SCD and CP due to hip osteonecrosis. **Methods:** In this cross-sectional observational study 17 individuals (6 male, 11 female, age $35,35\pm 9,38$) were evaluated to estimate EEG power density at rest for the delta, theta, alpha and beta EEG bands in the frontal, central, parietal, temporal and occipital regions of interest (ROI). Healthy control participants were paired by sex and age. EEG data were acquired with 30 electrodes, during four minutes, with eyes closed and at rest. The study was ethically approved under the CAAE 31237514.1.0000.0042 at the Faculdade Adventista da Bahia Ethics Committee. All participants read and signed the informed consent. **Results:** Individuals with SCD and CP presented higher power density in the delta [$F(1,29) = 12,51, p=0,001$] and theta [$F(1,29) = 9,54, p=0,004$] EEG bands, which correspond to the low frequency range of EEG bands. **Conclusion:** Individuals with SCD and CP associated with hip osteonecrosis present a shift to lower frequencies in the EEG bands, which may correspond to thalamocortical dysrhythmia, a maladaptive phenomenon already observed in other CP conditions such as neuropathic pain. This characteristic may be a key factor in the chronification of pain in these individuals and may help understand maladaptive brain functioning in these individuals. It may also help the development of targeted therapies to these dysfunctional characteristics, such as noninvasive brain stimulation techniques that aim to interfere with maladaptive plasticity.

Key words: Chronic pain, Sickle Cell Disease, Hip osteonecrosis, quantitative EEG, Power density.