

A Scoping Review of Protocol and Yield of Hyperventilation During Electroencephalography

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Objective: Hyperventilation (HV) is an effective activation procedure to provoke epileptic and interictal discharges in patients with epilepsy and to classify seizure types such as generalized and focal epilepsy. The objectives of this study were to establish the HV yield in clinical electroencephalography (EEG), evaluate the effect of voluntary HV on EEG, determine HV indications and contraindications, and identify the optimal HV protocol and HV mechanism during EEG.

Design: This was a scoping review study that involved identifying the initial research questions, identifying relevant studies, selecting the studies, charting the data, and summarizing and reporting results.

Setting: Literature review.

Method: We searched PubMed and Scopus databases for English articles published between 2000 and 2020 using search terms 'Hyperventilation' and 'EEG' in the title. Based on the abstract, we determined whether the article contained information about the effect of HV on EEG, the indications, and contraindications of HV, and/or the mechanism of HV. Based on the selected articles, we identified the protocol used in each study to distinguish the best protocol for HV.

Result: Among 1111 articles, 7 met our inclusion criteria, comprising 4 retrospective studies, 2 prospective studies, and 1 review. HV during clinical EEG provoked exacerbation of interictal discharge in 4.4-12.2% and induced seizure in 0.4-24%.

Conclusion: HV aids better in the diagnosis of generalized seizures, especially childhood absence epilepsy, than in the diagnosis of focal seizures.

Keywords: Hyperventilation, Electroencephalography, Epilepsy

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