Wake-Up Stroke

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Abstract

With an estimated 20% of ischemic strokes occurring during sleep, wake-up stroke (WUS) represents both a medical emergency and a significant clinical challenge. Although the time when a patient was last known to be well was traditionally used as an eligibility criterion in major clinical trials of intravenous thrombolysis, it is now recognized that physiological processes may predispose patients to stroke during the early morning hours. Epidemiological studies examining the circadian distribution of stroke onset have identified a peak between 6:00 and 8:00 a.m., which may be explained by concurrent increases in blood pressure and blood coagulability. Furthermore, patients with WUS appear more likely to have atrial fibrillation than the broader population of patients with acute ischemic stroke. Another relevant observation is the predominance of rapid eye movement (REM) sleep during the early morning hours. REM sleep is frequently accompanied by fluctuations in autonomic regulation, including changes in sympathetic and parasympathetic activity. Based on findings from several randomized clinical trials, contemporary acute stroke treatment guidelines support advanced neuroimaging-based selection of patients with WUS who may benefit from intravenous thrombolysis. Relevant imaging approaches include diffusion-weighted imaging/fluid-attenuated inversion recovery (DWI/FLAIR) mismatch and computed tomography perfusion (CTP) mismatch.

Keywords: wake-up stroke; sleep; thrombolysis; mechanical thrombectomy; obstructive sleep apnea

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Moždani udar nakon buđenja

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Sažetak

Procjenjuje se da gotovo 20 % ishemijskih moždanih udara nastaje tijekom spavanja, zbog čega moždani udar otkriven nakon buđenja (*wake-up stroke*, WUS) predstavlja hitno medicinsko stanje i značajan klinički izazov. Iako se vrijeme kada je bolesnik posljednji put viđen bez neuroloških simptoma tradicionalno koristilo kao kriterij za uključivanje u velika klinička istraživanja intravenske trombolize, danas je poznato da određeni fiziološki procesi mogu povećati sklonost nastanku moždanog udara tijekom ranih jutarnjih sati. Epidemiološka istraživanja cirkadijane raspodjele nastanka moždanog udara utvrdila su vrhunac incidencije između 6 i 8 sati ujutro, što se može objasniti istodobnim porastom arterijskog tlaka i koagulabilnosti krvi. Nadalje, čini se da bolesnici s moždanim udarom nakon buđenja češće imaju fibrilaciju atrija nego ukupna populacija bolesnika s akutnim ishemijskim moždanim udarom. Dodatno je važna činjenica da je REM spavanje zastupljenije tijekom ranih jutarnjih sati. REM spavanje često je praćeno promjenama autonomne regulacije, uključujući oscilacije simpatičke i parasimpatičke aktivnosti. Na temelju rezultata nekoliko randomiziranih kliničkih istraživanja suvremene smjernice za liječenje akutnog moždanog udara podupiru odabir bolesnika s moždanim udarom nakon buđenja za intravensku trombolizu na temelju naprednih neuroradioloških metoda. Relevantni pristupi uključuju nepodudarnost nalaza difuzijski ponderirane magnetske rezonancije i sekvencije FLAIR (DWI/FLAIR mismatch) te perfuzijsku računalnu tomografiju (CTP mismatch).

Ključne riječi: moždani udar nakon buđenja; spavanje; tromboliza; mehanička trombektomija; opstruktivna apneja u spavanju

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