

What role does sleep play in the development of cognitive reserve? A systematic review on the effects of sleep modulation in animal models

Monday, September 23, 2024 4:30 PM (10 minutes)

Individuals' responses to aging or neuropathological insults vary due to factors affecting the central nervous system's structure and function. Cognitive reserve, shaped by life experiences, helps protect the brain from neuronal damage. Modifiable lifestyle factors like sleep can enhance cognitive reserve, counteracting age- or disease-related brain changes. Sleep impacts cognitive domains, and sleep disruptions or disorders could pose neurodegenerative risks. The present work explores how positive or negative sleep modulations affect cognitive functions and neuromorphological mechanisms in rodents, aiming to understand its role in cognitive/brain reserve development.

The systematic review, performed according to PRISMA-P guidelines, was registered on Prospero (Registration ID: CRD42023423901). All articles published until June 2022 were considered and the search was performed on four databases: Pubmed, Scopus, Web of Science, and Embase. The search strategy utilized terms related to sleep, rodents, and cognitive functions.

Out of the 28,666 articles found on databases, 142 met the inclusion criteria.

The data, divided by species (mouse/rat), were analyzed based on cognitive domains (learning, memory, executive functions, and attention) and sleep manipulation types (REM, total, or circadian alteration, with enrichment or deprivation), and duration (acute or chronic).

Data revealed a significant cognitive decline after sleep deprivation, particularly in the memory domain, while other domains exhibited varied results. Regarding this, limited studies on REM sleep enrichment via medication hinted at enhanced memory performance. These findings confirm that sleep modulation affects cognitive and neuromorphological processes, underscoring the importance of sleep as a critical factor in modulating brain/cognitive reserve.

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Session Classification: Mini-talks: LIFE CYCLE