Blocked brain pathways may hint at early Alzheimer's

The study found that the pathways surrounding blood vessels, filled with cerebrospinal fluid, help remove neurological waste.

Web Desk January 12, 2026

The study found that the pathways surrounding blood vessels, filled with cerebrospinal fluid, help remove neurological waste.

However, arterial stiffness and high blood pressure can disrupt this process, leading to waste accumulation in the vessels. When this occurs, the drainage pathways—known as perivascular spaces—expand.

The researchers noted that enlarged perivascular spaces (EPVS) are more commonly observed in individuals showing early signs of Alzheimer's.

Associate Professor Nagendran Kandiah, who led the study at NTU's Lee Kong Chian School of Medicine, said these abnormal brain changes can be detected using standard MRI scans, commonly employed to evaluate memory and cognitive function. "EPVS identification could complement existing methods for early Alzheimer's diagnosis without requiring additional tests or costs," he explained.

Co-author and NTU medical student Justin Ong highlighted the importance of early detection, saying it allows timely interventions to slow cognitive decline, memory loss, reduced processing speed, and mood changes.

Previously, the link between EPVS and Alzheimer's was unclear. NTU researchers compared EPVS with other established Alzheimer's indicators and found a strong correlation.

The study included 979 participants from diverse ethnic groups in Singapore, addressing a gap in research that often focuses on Western populations, whose findings may not apply universally.

Professor Kandiah noted that the prevalence of the Alzheimer's-linked APOE4 gene is approximately 50–60% in Caucasian dementia patients but less than 20% in Singaporean patients, underscoring the need for region-specific research.

including amyloid plaques and tau tangles—were elevated, indicating higher Alzheimer's risk.

While white matter damage is a common Alzheimer's indicator, the study found that EPVS was more strongly associated with biomarkers in MCI patients, suggesting EPVS could serve as an early warning sign.

"Although white matter damage is widely used in dementia assessment, our findings show that EPVS holds unique significance in detecting early Alzheimer's changes," Professor Kandiah said. He added that MRI could become a more accessible tool for timely diagnosis, potentially slowing disease progression before symptoms worsen.

Researchers plan to continue monitoring the study participants to confirm whether EPVS can reliably predict dementia risk and the onset of Alzheimer's disease.