With advanced age, comes an increased risk of Alzheimer’s Dementia (AD) - a progressive decline in cognitive brain function and subsequent death for which there is currently no treatment. While the clinical manifestations of Alzheimer’s and other dementias are mostly seen in people older than 65 [1], changes in the brain may happen slowly over decades. Scientists have not clearly identified the cause of AD, but there is evidence that modifying risk factors such as diabetes, high cholesterol, and high blood pressure may decrease the likelihood of developing this type of dementia. In women, estrogen is believed to boost brain function; consequently, the decline in estrogen level may contribute to cognitive impairment in postmenopausal women. Since women have a higher incidence of dementia than men, the effects of estrogen replacement on cognitive function is a topic of ongoing research. A study published in *Neurobiology of Aging* tried to find out if taking hormone therapy (HT) at different stages of menopause would improve metabolic risk factors of AD and prevent cognitive decline.

The study included 643 healthy postmenopausal women among which, 271 were in early menopause (6 years or less) and 372 were in late menopause (10 years or more). Each group was randomly assigned to receive either estrogen (with/without progesterone) or placebo. The participants underwent a detailed neuropsychologic and other health assessments before being enrolled in the study. Women with significant pre-existing medical conditions such as uncontrolled high blood pressure, diabetes, heart disease etc. were excluded from the study. Health assessments were done at baseline, at 2.5 years, and at 5 years. Standardized test scores were used to assess "global cognition, verbal memory, and executive brain functions." [2] Blood pressure, blood sugar, and cholesterol were among the 9 metabolic biomarkers evaluated.
At the end of the 5-year period, the participants were stratified into 3 groups (those with healthy metabolic profiles, poor metabolic profiles, and high blood pressure) and compared with each other. The results were as follows:

There was no significant difference in cognitive function among women who took HT vs placebo regardless of their metabolic profiles. Although both treatment groups (HT and Placebo) had improved global cognition and verbal memory/recall, executive functions (more complex mental tasks) were unchanged. This partial improvement across all metabolic profiles was attributed to “a learning effect”[2] during the study period. This means, even when risk factors improved, impact on brain function from HT was limited – at least in this study. The timing of menopause-onset did not seem to impact outcome in any of the groups.

Could it be that all the women in this study were too healthy to benefit from this type of intervention? Even the women in the “poor” metabolic group had biomarkers that were only “slightly” out of range. Although HT improved all the metabolic biomarkers in those with “poor” metabolic health, it did not lead significantly better scores in cognition. In my opinion, the limited neurocognitive benefits reported in this study do not justify exposure to the risks of taking HT i.e. cardiovascular events, blood clots, and breast cancer.

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