OPEN PEER REVIEW REPORT 1

Name of journal: Neural Regeneration Research
Manuscript NO: NRR-D-23-00203
Title: Neural stem cells promote neuroplasticity-a promising therapeutic strategy for Alzheimer's disease
Reviewer's Name: Yan Yan
Reviewer's country: USA

COMMENTS TO AUTHORS

This intriguing review paper discussed the impairment of neuroplasticity in Alzheimer's disease (AD), and the application of neural stem cells in the therapeutic strategies of AD. Specifically, the review summarized that NSCs therapy alleviate AD pathology, promote neuroplasticity though enhancing synaptic plasticity and promoting neurogenesis. In addition, it discussed the regulatory factors that promote NSCs migration, proliferation, and differentiation. While it provides promising potential for NSCs in AD treatment, clarification of points described below is needed.

1. A large number of mice models are addressed in the review, such as APP/PS1 mice, 5xFAD mice, SAMP8 mice, Tg2576 mice, 3xTg mice, pPDGF-APPSw, Ind-mice, CaM/Tet-DTA mice, ICR mice. Please provide a short description for each of mouse models in the manuscript.
2. In the introduction, impairment of AD neuroplasticity section, authors addressed that deficits of synaptic plasticity and neurogenesis in the hippocampus cause cognitive impairment, how about the subventricular zone neurogenesis? is it also impaired in the AD?
3. In the impairment of AD synaptic plasticity section, 3rd paragraph, the authors mention that 'the density of HIPP and CTX and basal nucleus dendrite spins decreased in aging and AD patients'. Does aging and AD patients encounter similar degree reduction of dendrite spins? Or AD is more severe?
4. In the same paragraph as question 3, 'according to their findings, the density of dentritic spins has decreased in AD patients', does density of dendritic spins also decrease in CAD?
5. Any clinic trial about the neural stem cell therapy in AD? If yes, what stage is the trial or result of these clinic trials.
6. What determine the NSCs migration pathway, authors mention BDNF regulate NSCs, any other regulator involve in NSCs migration. How to control migration in the practical application?
7. What are the applicable NSCs transplant pathways clinically, pros and cons for each transplant pathway?