|  |
| --- |
| **Innovative approaches for behaviour management and health promotion——precision prevention for progression from mild cognitive impairment to Alzheimer’s Disease** |
| **Background/Objectives**  Mild cognitive impairment (MCI) is an intermediate state between dementia and normal aging and it is a stage in which intervention could be effective in reducing the conversion rate to dementia. It is important to find the high risk population with MCI for the intervention. The aim of the present study is to evaluate the effect of precision prevention on progression from MCI to AD using the innovative approaches based on genetic risk information and modifiable behaviour. As lipids represent easily modifiable behaviour targets, we examined the longitudinal relationship of baseline lipids with 4.5-y incident AD in older community-dwelling persons.  **Methods**  At the baseline of the Shanghai Aging Study (2010-2011), we established a sub-cohort with 655 MCI cases aged 50 or older reside in Jingansi community in downtown Shanghai. The final study sample comprised of 316 participants who were prospectively followed up for 4.5-y. The lipids effect on MCI-AD progression was assessed among total MCI participants and in stratified genetic-risk subgroup. The effects of genetic variants and lipids on MCI-AD conversion were assessed using Kaplan-Meier method with log-rank test and cox regression model.  **Results**  Results showed that *ABCA7* rs4147929 and *PVRL2* rs6859 were significantly associated with MCI-AD progression (AG/AA *vs.* GG, HR=1.82, *p*=0.036, and AG/AA *vs.* GG, HR=2.58, *p*=0.008, respectively). The MCI participants were stratified into two subgroup (low AD genetic-risk group and high AD genetic-risk group) based on comprehensive genetic-risk factors, and the association of lipids and MCI-AD progression were analysed both in total MCI samples and subgroup. Results demonstrated that MCI participants with high AD genetic-risk maintaining moderate LDL-C level (2.60-3.99 mmol/L) at baseline have significantly decreased MCI-AD progression (*p*=0.024), compared with low LDL-C level (< 2.60 mmol/L) which actually is the recommend LDL-C lowering values for cardiovascular risk. However, no significant results were found in total samples or low AD genetic-risk subgroup.  **Discussion**  It is noteworthy that older adults with MCI with high AD genetic-risk should maintain the moderate LDL-C level rather than excessively reduced lipids concentration to prevent both AD and cardiovascular disease. In conclusion, the present results indicated that it is important and innovative to apply the genetic information into behaviour management to better promote the population health.  **Keywords**  Mild cognitive impairment; Progression; Alzheimer’s disease; lipids; behaviour management |