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认知训练对阿尔茨海默病的作用机制及其影响研究

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摘　要

阿尔茨海默病(Alzheimer's Disease, AD)是一种以进行性认知功能障碍和行为损害为特征的中枢神经系统退行性病变，其病理特征是Aβ、tau蛋白等异常积累，主要表现为认知功能障碍和记忆力减退。本文旨在分析探究认知训练对AD患者的作用机制、疗效及重要性，为今后制定更为科学合理的认知训练方案提供依据。通过文献分析法，查找Pubmed资料库中认知训练对AD的干预效果的科学研究。发现针对AD患者的认知训练主要包括计算机化认知训练(Computerised Cognitive Training, CCT)、纸笔认知训练 (Paper-Based Cognitive Training, PBCT)、运动和多元认知训练，通过促进大脑中的神经可塑性机制保持完整区域改善其功能，减少认知缺陷，提高老年人的认知功能，从而治疗AD，降低AD发病率。因此，不同的认知训练方法可根据AD患者的病情程度和个人表现水平应用进行适用性调整，合适的认知训练是保障日常需求、提高认知能力、延缓AD进展的有效措施，对AD患者是有益的，但仍需进一步的临床试验研究。

关键词

阿尔茨海默病，非药物干预，计算机化认知训练，纸笔认知训练，多元认知训练

Study on the Mechanism and Influence of Cognitive Training on Alzheimer's Disease

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Abstract

Alzheimer's disease (AD) is a degenerative disease of the central nervous system characterized by progressive cognitive dysfunction and behavioral impairment. It is characterized by abnormal accumulation of A β and tau proteins, which are mainly manifested by cognitive dysfunction and memory loss. This study aims to analyze and explore the mechanism, efficacy and importance of cognitive training for AD patients, so as to provide a basis for developing more scientific and rational cognitive training programs in the future. Through literature analysis, scientific studies on the intervention effect of cognitive training on AD in Pubmed databases were searched. It is found that cognitive training for AD patients mainly includes computerised cognitive training, paper-based cognitive training, exercise and multi-component cognitive training can improve the function of the regions in the brain by promoting the neuroplasticity mechanism to remain intact, reduce cognitive deficits and improve cognitive function in the elderly, so as to treat AD and reduce the incidence of AD. Therefore, different cognitive training methods can be applied to adjust their applicability according to the degree of disease and individual performance level of AD patients. Appropriate cognitive training is an effective measure to ensure daily needs, improve cognitive ability and delay the progression of AD, which is beneficial to AD patients, but further clinical trials and studies are still needed.

Keywords

Alzheimer's Disease, Non-Drug Intervention, Computerised Cognitive Training, Paper-Based Cognitive Training, Multi-Component Cognitive Training

1. 前言

阿尔茨海默病(Alzheimer's Disease, AD)是一种以进行性认知功能障碍和行为损害为特征的中枢神经系统退行性病变，是老年失智中最常见的类型，约占 65 岁以上人群失智症总病例的 50%~60%。AD 的特点是不可逆和进行性功能、认知能力下降和行为丧失从而削弱人的功能[1]。AD 患者会经历多种症状，主要表现为渐进性记忆障碍、认知功能障碍、人格改变及语言障碍等神经精神症状[2]，通常伴有健忘症、失认症、失用症、失语症等多种脑部疾病，最常见的症状之一是记忆力减退[3]。据世界卫生组织报告，目前有 5000 万人患有 AD，预计到 2050 年这一数字将增加两倍，达到 1.52 亿。其中，中国 AD 患者数居世界第一，占世界 AD 患者总数量的四分之一[4]。且 AD 患者的百分比随着年龄的增长而急剧增加，病情也随着时间的推移而恶化。

据估计，5%~10%的 AD 患者在失智之前出现轻度认知障碍(Mild Cognitive Impairment, MCI)。认知障碍会增加个体跌倒的风险，并带来较高的健康成本，每年 AD 患者例数与认知功能受损的数量和症状的严重程度成正比[5]。目前，临床上具有许多改善 AD 进展的治疗，主要分为药物干预与非药物干预。通过药物干预和非药物干预都可以改善个体的认知功能、症状和生活质量，减少破坏性行为，减缓从 MCI 到失智的进展，并延迟住院[6]。但 AD 病程长，需要长期治疗，而可用于 AD 的药物治疗在逆转甚至阻止 AD 进展方面的疗效有限，且不能完全减缓或阻止导致 AD 症状，并损伤和破坏使 AD 致命的神经元[7]，长期以往就有可能给个人、家庭、社会带来沉重又持续的负担。幸运的是，研究证明以非药物干预补充

药物干预的综合治疗比仅靠药物干预更能减轻患者的病情[8]，延缓疾病的进展，维持认知功能。并且可以显著降低 AD 的发病率，减少医疗费用，并提高受影响个体的生活质量。因此，非药物干预对此前期干预 AD 尤其重要。

在这篇综述中，旨在通过关注认知训练对 AD 的影响，特别强调认知训练对 AD 的作用机制、疗效、重要性。

2. AD 的发病机制

AD 是一种进行性神经退行性疾病，会导致整个大脑出现广泛的神经病理学，并严重破坏认知和记忆功能[9]。多种宏观和微观神经病理学特征代表了 AD 的病理生理学特征。宏观的显著特征是对称和弥漫性萎缩，沟和脑室都扩大，脑回旋变平；这些变化表明神经元大量减少[10]。在显微镜检查中，AD 的两个特征性改变包括老年斑(或淀粉样斑块)和神经原纤维缠结(Neurofibrillary Tangle, NFT)；第一种是由 β-淀粉样蛋白前体蛋白(Amyloid Precursor Protein, APP)过量产生的淀粉样蛋白-β 肽(Amyloid Protein, A β)的细胞外聚集形成的，而第二种是由细胞质水平的过度磷酸化 tau 蛋白在细胞内沉积形成的[11]。除了 A β 和 tau 蛋白，AD 发病还与多种因素有关，例如神经炎症因子[12]。神经炎症分泌物与邻近的神经胶质细胞结合，海马体和顶叶、额叶和枕叶皮层等这些选定大脑区域的功能障碍，引起神经元数量减少[13]，使其存在神经病理学异常，导致多种行为和认知障碍[14]。

2.1. A β 的沉积

A β 是一种正常分泌的肽，来源于较大的 APP，通过两种蛋白酶 β-和 γ-分泌酶的协同和顺序作用[15]。A β 具有一定的生理功能，早期研究表明极低浓度的可溶性 A β 促进神经元存活和轴突分支，调节 K^+离子通道的功能，参与神经元的正常功能[16]。然而 A β 原纤维在高浓度下对成熟神经元有毒性，导致树突和轴突收缩，随后细胞死亡。A β 原纤维会迅速从健康个体的大脑中清除，半衰期在 1 到 2.5 小时之间[17]。由于 A β 斑块在大脑中的形成显示出损害泛素－蛋白酶体系统活性的能力，导致神经元功能障碍和死亡，从而促进进行性记忆丧失和认知能力下降[18]。

2.2. tau 蛋白的过度磷酸化

Tau 是一种稳定的微管(Microtubule, MT)相关蛋白，其功能主要受磷酸化调节。Tau 蛋白在 AD 中被发现过度磷酸化，这可能是其失去 MT 稳定能力的原因。而 MT 的不稳定可能导致神经退行性疾病的毒性，从而导致认知功能下降[19]。磷酸化的 tau 蛋白极大地影响了神经元微管的稳定性，且其具有自我聚集的能力，通过这种自聚集，逐渐形成纤维，沉积为 NFT，寡聚体和纤维的形成可以通过影响神经胶质细胞和神经元的功能来介导 AD 的病理进展[20]。

2.3. 神经炎症因子

大脑中炎症介质的主要来源是小胶质细胞和星形胶质细胞。小胶质细胞和星形胶质细胞可以释放细胞因子，这些细胞因子可以根据刺激和微环境在大脑中发挥促炎和抗炎作用[21]。小胶质细胞是中枢神经系统中神经炎症的最大参与者，在 AD 中小胶质细胞对 A β 有反应，A β 在小胶质细胞中的积累会导致小胶质细胞死亡和炎症增加以及更多小胶质细胞的募集，从而继续这种炎症级联反应[22]。在 AD 中，星形胶质细胞的正常功能受到影响并导致星形胶质细胞功能障碍和炎症，从而导致神经元功能受损。而且激活的星形胶质细胞通常会失去向神经元输送营养的能力，进而释放细胞因子，导致神经元毒性增加以及神经元过程的生长减少和整体活动率降低[23]。小胶质细胞和星形胶质细胞协同工作可加速高度神经元损伤不同的疾病，增加 AD 中的神经炎症。

3. 认知训练对 AD 的影响

AD 是一种神经退行性综合征，其特征是存在 Aβ 聚集、磷酸化 tau 蛋白进入 NFT、神经炎症、氧化损伤以及神经元和突触变性[21]，这些大脑改变有助于促进进行性记忆丧失、认知能力下降、日常功能丧失以及精神和行为障碍[24]。AD 病理标志的空间进展已被充分了解多年，从内侧颞叶扩散到额叶、外侧颞叶和顶叶区域和 AD 保留区域的变化，以及弥漫性全局萎缩，已被证明与 Aβ 和 tau 蛋白病理学水平升高有关[25]。背侧(枕顶叶)和腹侧(枕颞)皮质视觉区域与分散注意力和持续注意力相关的注意力机制受损与老年人的视觉空间记忆功能受损有关，视觉空间下降与轻度至中度 AD 患者的双侧顶叶和右侧颞顶叶代谢降低有关[26]。核心执行功能(工作记忆、抑制、认知灵活性)取决于前额脑区域——与年龄相关的衰退最脆弱的区域之一，其还涉及许多认知过程和高阶功能[27]。此外，AD 患者的丘脑、后扣带回和前扣带回以及海马灌注的异常减少预示着其随后可能会转变为可能的 AD [28]。因此，通过促进大脑神经可塑性机制可促进老年人的认知和神经增强，从而治疗 AD，降低 AD 发病率。

随着人口老龄化的加剧，AD 和其他失智症的数量急剧增加，其对患者健康和生活质量产生巨大的负面影响[29]，发病前的漫长阶段为改变病程和推迟症状表现提供了可能性。迄今为止，还没有针对这种绝症开发出有效的药物治疗方法[30]，这引起了非药物干预的发展。现在，非药物治疗在预防和缓解 AD 症状方面发挥着越来越重要的作用[31]，如认知训练、认知刺激、认知康复等。在各种方法中，与 MCI 或早期 AD 患者的认知刺激和认知康复相比，认知训练是最有效的方法[32]。

认知训属于 AD 传统的非药物干预治疗的其中一种，用于维持或改善有或无认知障碍的老年人的认知功能。尽管证据基础非常有限，但一些人体试验表明认知训练主要通过促进大脑中的几种神经可塑性机制保持完整区域活跃和补偿失去的功能来减少认知缺陷[33]，这些机制主要包括神经化学激活、氟脱氧葡萄糖摄取改变、tau 蛋白水平降低和 Aβ 负荷减少[34]。认知训练可使右侧脑岛、左侧眶额叶和梭状皮质厚度增加，海马体积稳定或增加，各向异性分数(Fractional Anisotropy, FA)增加和平均扩散系数降低(Mean Diffusion Coefficient, MD)在胼胝体膝部，增加额叶白质束中的 FA 以响应训练[35]，改变颞回和小脑自发波动的区域同质性，增强额回和小脑低频波动的幅度，减少上顶叶皮层和下颞叶之间的功能连接[36]，从而激活大脑。而且，这些数据支持高龄灰质和白质结构的经验依赖可塑性，灰质可塑性的潜在细胞机制包括轴突萌芽、树突分支和突触发生、神经发生和胶质细胞变化，而白质变化的潜在机制包括髓鞘形成、纤维组织变化、星形胶质细胞变化和血管生成[35]。

许多证据表明在 AD 的早期阶段与训练相关的认知表现有所改善[35]，使患者提高或保持人体的记忆、执行功能、视觉空间技能和语言等特地领域的能力[37]，改善老年人的行为结果，还可以预防或延缓 AD 症发作，使日常生活受益。因此，认知训练作为一种非药物的、具有成本效益的 AD 干预和治疗方法，对 AD 进展有重要意义。

认知训练通常涉及一组标准化任务的指导性练习[38]，这些任务旨在反映特定的认知功能，有针对性地提高整体认知或特定领域(包括记忆、注意力、速度、执行功能、解决问题的能力和语言等)和日常生活技能(如金融知识或驾驶表现) [39]。AD 的病理特征包括大脑结构和功能的改变，一些生活方式因素和训练任务可能会增加或减少个体患 AD 的风险。由于大多数 AD 患者或患 AD 症的高危人群居住在社区中，所以针对 AD 的认知训练的任务一般以计算机化形式、纸笔形式或日常生活形式(如运动、穴位按压)呈现，促进老年人的认知和神经可塑性[27]，并由根据病情程度和个人表现水平进行适应性调整。

3.1. 计算机化认知训练对 AD 的影响

AD 根据认知能力和身体机能的恶化程度一般分成三个时期，分别为包括临床前 AD、MCI 和失智[40]。计算机化认知训练(Computerised Cognitive Training, CCT)是一种用于认知障碍患者的非药物干预方

法，相比其他类型的认知训练，CCT 更适合家庭使用和个性化训练方案[41]，其通过支持更积极的认知生活方式来改善 AD 患者的认知表现。CCT 主要是由大规模大脑网络中的神经可塑性介导的，涉及针对特定能力(例如记忆力、执行功能、语言和注意力)的计算机化认知练习，以改善认知功能，从而更有效地配置和配置这些认知资源的策略的发展[42]。

一些关于不同认知障碍程度与 CCT 研究的荟萃分析发现，相同强度的 CCT 对老年人和 AD 患者改善认知障碍的疗效不同[43]。CCT 的系统康复可以较大幅度地降低老年人患 AD 的风险，改善 AD 患者的认知和情感状态，而不提供准时刺激认知功能的康复计划则没有显著效果[44]。前瞻性研究还表明，即使 CCT 是在晚年开始，也有积极的好处，据报道衰退率降低，AD 发病率降低[45]。与 AD 失智患者相比，MCI 患者的认知功能受损程度更轻，更容易接受 CCT，在延迟记忆、命名、语义流畅性、视空间能力、执行功能、注意力和处理速度方面有显著的有益影响[46]，减缓神经退化的进展。AD 是不可逆转的，发展到失智阶段将无法治愈，因此，从客观的角度来看，越早期进行 CCT 的 AD 患者改善认知障碍的疗效越好。

科学研究发现，“整体”治疗可以显著改善 AD 患者的行为和功能方面：在未进行其他治疗的情况下，未接受 CCT 的 AD 患者可能随着年龄的增大病情无显著变化且可能恶化[47]，接受较轻强度的 CCT 的患者仅在评估日常生活功能能力上有所改善[48]，而接受较强强度的 CCT 的患者在日常生活中的表现和文字语言流畅性都有所提升，且接受较强强度的 CCT 的患者的看护者压力有所改善[49]。然而，人到老年时，身体的各项机能减弱，身体状况和心理素质都会受到一定的影响。因此，在进行 CCT 时，应根据病情程度和个人表现水平进行适应性调整，选择适合强度的训练更有助于 AD 的治疗。

由于 AD 临床前表现出的长久性，CCT 对 AD 患者的长期影响及疗效的稳定性至关重要。有研究发现，经过 CCT 的 AD 患者在初级工作记忆和次级工作记忆(用于语言和视觉刺激)、信息处理速度参数整体认知或特定领域等都有显著改善[50]，这些认知参数的改善在完成训练计划后的五个月内可得以维持，在十二个月后减弱[51]，这突出表明长期的 CCT 可使 AD 患者的认知能力提高。此外，与需要训练有素的神经心理学家的传统神经心理学训练方法相比，在 MCI 患者的记忆和执行功能、积极情感、冷漠和生活质量等认知领域进行 CCT 的效果更好，并具有转移效应。而且，CCT 的实施成本低得多且更容易根据个体患者的认知状态优化计算机认知训练[52]，对个人、家庭、社会而言更具有优势。为此，建议可以更广泛地使用 CCT 来预防和治疗老年人的认知缺陷，延缓 AD 的进展，维持认知和生活质量。

3.2. 纸笔认知训练对 AD 的影响

纸笔认知训练(Paper-Based Cognitive Training, PBCT)是一种传统的认知训练，需要面对面的互动和使用纸笔方法教授。PBCT 可以提高认知正常者在特定认知域的表现，如加工速度、执行功能及记忆力。研究表示，有进行 PBCT 的 AD 患者语言、注意力和执行功能都有显著改善[53]，PBCT 对 AD 早期的一般认知功能产生有益影响，可作为 AD 早期的潜在非药物干预手段。

相比 CCT，PBCT 对于经济压力大且没有护工的家庭可能更适用，因为电子设备的使用对老年人和 AD 患者来说可能是困难的[54]。此外，为所有机构配备用于基于计算机的培训的电子设备具有挑战性。据报道，基于计算机和基于纸张的认知训练对 MCI 患者均有益，然而，传统的 PBCT 在一般认知功能、学习能力、延迟言语回忆、视觉记忆、言语流畅性和视觉选择性注意方面有更好的结果，并且还可以转移现实生活中的主要认知益处[55]。

3.3. 运动对 AD 的影响

AD 是失智症最常见的病因，其特征是 A β 斑块和 NFT 在脑内累积，造成神经元突触和锥体神经元

的丧失，且伴有进行性认知神经变性[56]，而 A β 斑块在大脑中的形成会导致神经元功能障碍和死亡[57]。研究表明，与体力活动较少的人群相比，体力活动水平较高的人患失智症的风险要低 14%。运动可通过一系列神经元机制，如下调导致 A β 和 tau 蛋白产生的途径，防止 A β 诱导的氧化应激、损伤和记忆缺陷等，从而对学习和空间记忆减少认知衰退和 A β 水平以及保持突触可塑性和产生防止记忆相关信号分子失调的积极影响[58]，直接减轻现有 AD 患者的 AD 严重程度。而且，运动可以增强全身和中枢神经系统的抗炎作用，即使在衰老过程中也是如此。与运动相关的基本细胞因子可以减少 AD 相关的神经炎症，防止疾病进展，并促进其他已被证实的神经保护作用，如支持神经元可塑性、刺激成人神经发生和增强认知功能，并建立一种治疗性运动模拟，以对抗 A β 相关的神经变性[59]。

此外，在 AD 中，与更复杂的大脑功能相关的区域，被认为对类情景记忆相对重要的海马回路最受到影响，海马体的体积增大与认知能力的提高有关[60]。通过了解老化大脑的生理学，可知运动会对大脑的三个区域产生影响：血管生理学、海马体积和神经发生，可直接调节免疫球蛋白超家族受体水平[61]，增加海马体的大小，提高认知能力，增强大脑的可塑性，从而改变调节大脑老化。由此可见，运动可以有效改善 AD 的几种神经精神症状，如认知、神经精神症状和生活质量，比较显著的是认知功能[62]。

而且大多数前瞻性研究已经证明，缺乏身体活动是发展为 AD 最常见的可预防风险因素之一，较高的身体活动水平与降低 AD 发展的风险相关[1]。早期体力活动干预对 AD 高危人群具有积极的预防作用，身体活动对久坐不动的老年人的认知有普遍的积极影响[63]，长期运动训练可延迟生理性记忆丧失的发生而产生的积极影响，中等强度运动会增加海马体的大小，以及增加健康老年人的空间记忆[64]，有氧运动激活已知参与整体认知(Global Cognition, GC)，工作记忆(Working Memory, WM)和执行功能(Executive Function, EF)的大脑区域，例如动物的内侧前额叶、鼻周皮质、纹状体、海马体和中缝核，以及背侧前扣带皮层、辅助运动区、额上回和额中回、右额下回、颞中回、前白质束和人类海马体，诱导认知过程中激活的神经可塑性和神经保护作用[65]，显著减缓了轻度至重度 AD 患者整体认知能力的自然衰退。

与药物治疗相比，运动已被证明具有更少的副作用和更好的依从性，运动持续时间显著影响改善 AD 结果[66]。因此，对于 AD 的早期阶段和一般失智症的预防，运动具有重要的已知神经保护作用，保护失智和神经退行性疾病的认知功能，其作为一种预防与年龄相关的记忆丧失和神经退行性变的策略是有效的[67]。

3.4. 多元认知训练对 AD 的影响

对 AD 患者而言，制定合适的预防性干预策略对于降低认知能力下降和失智症的发生率非常重要。认知训练可以改善社区生活老年人的记忆力、视觉推理、视觉空间、注意力和神经心理状态，并有助于长期维持认知功能。一项荟萃分析发现，在 AD 的临床治疗中，相比单一认知训练，多元认知训练对记忆力的改善较小，但对其他认知功能的影响更广，改善执行功能和处理速度的效果更好[68]。多元认知训练增强记忆能力，单一认知训练增强视觉空间/建构和注意力能力，而多元认知训练在训练效果维持方面更具优势[69]。多元认知训练包括复杂的认知过程，比单领域训练对多个认知领域产生更广泛的影响[70]。因此，在 AD 患者的临床治疗中，采用多元认知训练是一个明智的选择。

3.4.1. 计算机化认知训练和运动的联合干预对 AD 的影响

最近一项随机对照试验(Randomized Controlled Trial, RCT)进行的系统回顾和网络分析表明，CCT 和运动的协同作用可能通过诱导脑源性神经营养因子和海马神经发生的释放来增加神经可塑性，通过认知和运动系统的参与以及多感官输入的整合，重建类似于日常生活需求的训练环境的可能性[71]。由上述的 AD 影响可得知，CCT 和运动都具有预防认知缺陷、延缓认知功能、延缓 AD 进展和维持生活质量的作用。此外，这两种认知训练的联合干预对健康和认知受损的老年人产生了相当的认知和身体益处，且优

于单一的训练干预[72]，因此通过 CCT 和运动的联合干预可降低认知衰退和失智症的风险，对 AD 患者的益处极大。

3.4.2. 计算机化认知训练和穴位按压的联合干预对 AD 的影响

穴位按压是一种非侵入性技术，涉及使用手指、拇指、指关节或适当的穴位按压工具对穴位施加压力[73]，通过指压按摩是一种非侵入性技术，涉及使用手指、拇指、指关节或适当的指压工具对穴位施加压力，增强创伤性脑损伤(Traumatic Brain Injury, TBI)后认知障碍参与者的工作记忆功能[74]。在 AD 治疗中，单独使用 CCT 有助于缓解原发性疲劳症状，提高认知能力，降低 TBI 的伤害[75]。研究表明，穴位按压和认知训练均能改善老年 MCI 患者的认知功能，且两者联合应用时效果更显著。对于患有 AD 的老年人，穴位按压可以作为一种补充干预措施来改善社区老年人的认知功能和预防失智[76]。因此，穴位按压可与 CCT 等其他干预措施相结合，以更好地改善认知功能，延缓 AD 进展。

3.4.3. 运动和经颅直流电刺激对 AD 的影响

经颅直流电刺激(Transcranial Direct Current Stimulation, tDCS)是一种低成本无创且安全的脑刺激方法，通过连接到头皮并放置在目标大脑区域的表面电极施加微弱且恒定的电流，从而调节神经元活动并引发神经可塑性变化[77]，这主要表现在人类运动皮层，例如初级运动皮层[78]。在一些针对 AD 失智患者的研究中证实，tDCS 作为一种重要的治疗方法可以促进早期治疗 MCI 患者和 AD 患者，可以暂时但有意义地改善与衰老相关的认知能力下降，改善视觉记忆识别任务[79]。值得研究的是，运动和 tDCS 都具有改善认知功能，延缓 AD 发病的疗效，运动和 tDCS 的联合干预是否可以产生更大的治疗效果。通过荟萃分析发现，运动和 tDCS 的联合干预扩大了分配给步行控制的前额叶执行－注意力资源的可用性，从而更有效地补偿受损的运动自动化。由于阳极 tDCS 促进的神经元兴奋性增加，患者可能已经能够募集更多的神经元[80]。此外，在一项 RCT 中，tDCS 和运动在对健康人进行的认知训练干预中，比单独使用每种技术更可以增强对执行功能和工作记忆游戏的学习，且在多个认知领域取得更大的改善[81]。由此看来，将运动与 tDCS 联合干预(如在有氧运动中应用 tDCS 刺激大脑)有可能减缓 AD 患者认知能力下降的症状进展[82]。但是，除了不同的机制和大脑功能的调节能力外，这两种技术有相似之处，联合使用之时应根据患者的实际情况调整。

4. 结论与展望

AD 是以进行性记忆力减退和获得性知识丧失，直至日常生活活动能力完全丧失为特征，一般好发于 65 岁以上的老年人。目前，我国是全世界 60 岁以上老年人口最多的一个国家，随着人口老龄化和人口增长的增长趋势预测，未来 AD 患者可能会持续上升。但可用于 AD 的药物治疗疗效不佳，无法实现完全治愈，且不断增加的医疗费、精神压力也给社会和家庭带来沉重负担，成为严重的社会和医疗卫生问题。仅依靠药物治疗改善 AD 进展是十分困难的，因此应积极地采取非药物干预补充药物干预的综合治疗。对于已患有 AD 的患者，通过加强患者的认知训练，培养和训练 AD 老人的语言、记忆、注意力、速度、执行功能、解决问题的能力和生活自理能力，加强体育锻炼，形成健康生活方式，保障患者日常生活上的需求，训练生活自理能力，延缓认知能力衰退，降低认知衰退和失智症的风险。即使未患有 AD，也应加以预防认知衰退的发生，减少患 AD 的风险。因此，研究认知训练是保护认知功能的有效干预措施，对 AD 的影响是非常有益的，加强宣传 AD 的相关知识也是很有必要的。

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