

## 癫痫共患注意缺陷与多动障碍（ADHD）患儿执行功能的研究

刘美燕<sup>1</sup>, 王荣<sup>2\*</sup>

<sup>1</sup>承德医学院 河北承德

<sup>2</sup>沧州市人民医院儿科 河北沧州

**【摘要】** 癫痫（Epilepsy）是儿童时期最常见的神经系统疾病之一，其病因复杂、表现形式多样，常导致患者执行功能障碍。ADHD 不仅是儿童常见的神经发育性疾病还是癫痫最常见的共患病之一。共患病的存在加重了疾病的诊治困难，还对患者的执行功能产生更为严重的影响。本文将对癫痫、ADHD 以及癫痫共患 ADHD 对患者执行功能的损害进行综述。

**【关键词】** 癫痫；ADHD；共患病；执行功能

### Study on executive function in children with epileptic attention deficit and hyperactivity disorder (ADHD)

Meiyan Liu<sup>1</sup>, Rong Wang<sup>2\*</sup>

<sup>1</sup>Chengde Medical College, Chengde, Hebei

<sup>2</sup>Pediatrics of Cangzhou People's Hospital, Cangzhou, Hebei, China

**【Abstract】** Epilepsy is one of the most common neurological diseases in children, It has complex etiology and various manifestations, and often leads to executive dysfunction. ADHD is a common neurodevelopmental disorder in children but also one of the most common comorbidities of epilepsy. Presence of comorbidities aggravates the difficulty of diagnosis and treatment of the disease, and causes more serious damage to the patients' executive function. This paper will review the impairment of epilepsy, ADHD and epileptic comorbid ADHD to patients' executive function.

**【Keywords】** Epilepsy; ADHD; Comorbidity; Executive Function

#### 1 概述

癫痫（Epilepsy）是脑部神经元异常放电所导致的一种长期、慢性、反复发作的神经障碍性疾病。全球大约有 6500 万人受到该疾病的影响，给全世界尤其是发展中国家带来了沉重的公共卫生负担<sup>[1-2]</sup>。研究表明 80% 癫痫儿童至少存在一种共患病<sup>[3]</sup>，注意缺陷与多动障碍（Attention-deficit/hyperactivity disorder, ADHD）是癫痫最常见的神经障碍性共患病之一，共患率约 13-70%，并以注意力缺陷型为主<sup>[4-5]</sup>。ADHD 表现为与正常同龄儿不相符合的注意力不集中、过度活动、冲动、与伙伴交流差等症状，该疾病影响约 5% 的学龄期儿童，该疾病尽管在早期就能被诊断出来，但其症状可一直持续至成年<sup>[6]</sup>。目前将注意缺陷多动障碍分为注意力缺陷为主（ADHD-IA）、多动/冲动为主（ADHD-HI）及混合表现为主（ADHD-C）三种亚型<sup>[7]</sup>。

执行功能（executive function, EF）是认知的高级形式，是指对意识、行为目标进行自我调控、思维控制和监督的过程，包括工作记忆、抑制控制、启动/监测和设置转移等，这些主要的执行功能能够帮助调节情绪、语言发展、思想和行为<sup>[8-10]</sup>，研究表明执行功能的损害会导致儿童学习困难、社交障碍、情感困扰，认知灵活性降低，甚至对社会生活能力造成终身影响<sup>[11]</sup>。目前国内外常用的执行功能检测方法有执行功能行为量表（BRIEF）、韦氏智力量表（WISC-IV）、图形测试、连线测试、Stroop 色词测验、威斯康辛卡片测验（WCST）、语言流畅类别切换测试（VFCS）、Go/No-Go 任务等等。

#### 2 儿童癫痫的执行功能

人体情感与记忆能力的调节与额颞区密切相关，因此相关研究认为，大脑额、颞叶的结构或功能缺陷

作者简介：刘美燕（1995-），女，贵州遵义，研究方向：小儿神经。

\*通讯作者：王荣（1964-），女，河北沧州，主任医师，研究方向：小儿神经。

会导致执行功能的异常。其中前额叶对执行功能的调节起着至关重要的作用, 颞叶的损伤会引起语言功能的严重下降<sup>[12-13]</sup>。癫痫患者存在脑部结构功能的异常, 其可能是导致执行功能损伤的基础, 故而在特定领域表现出执行功能的整体或部分缺陷, 有学者研究发现 30%-50% 的癫痫儿童存在执行功能的异常<sup>[14-15]</sup>, 尤以工作记忆更显著<sup>[16]</sup>, 儿童良性癫痫伴中央颞区棘波 (Benign childhood epilepsy with centrotemporal spikes, BECTS) 是儿童时期最常见的局灶性癫痫, 尽管称其为“良性”癫痫, 但其执行缺陷和行为障碍可能对生活质量、社会适应和学业表现产生负面影响<sup>[17-18]</sup>, Cheng、Jun Ye-Hwa 和 Lima 等人<sup>[19-20,46]</sup>采用 WCST 证实了 BECT 患者存在明显抑制控制和工作记忆等执行功能的损害, WCST 被常用于测验认知的灵活性, Lima 还分别通过儿童韦氏智力量表、连线测验、匹配熟悉图测验评估 BECT 与健康儿童的语言注意力和工作记忆能力、交替注意力和转移能力、抑制控制, 研究结果示 BECT 患者的执行功能相关损害皆较正常儿童严重。Kucukboyac<sup>[21]</sup>等用 VFCS 研究颞叶癫痫患者的任务交换能力, 结果提示无论左侧还是右侧颞叶癫痫, 其词语流畅得分显著均低于健康儿童。Kelle 等<sup>[22]</sup>通过 Stroop 色词干扰测验评估 43 例颞叶癫痫患者和 30 例健康儿童的执行功能, 发现实验组患者的实验耗时间较对照组久, 提示其执行功能的受损。这与 Deltour 等<sup>[23]</sup>的结果大致一致。Malfait 等人<sup>[24]</sup>也发现在 Stroop 色词测验实验中, BECT 患者在抑制任务错误次数多于正常对照组。Li Yihan 等<sup>[25]</sup>利用 WISC-IV 对 BECT 儿童执行认知测评, 发现 BECT 组儿童的言语理解指数、直觉推理指数、工作记忆指数和加工速度指数和总智商均显著低于对照组。这与 Ciumas 等<sup>[26]</sup>的研究相符合。Cerminara 等<sup>[27]</sup>发现在 Go/No-Go 任务中, 实验组和对照组之间的反应时间、委托错误次数存在显著差异。2007 年 Parrish 等<sup>[28]</sup>使用 BRIEF 量表对 8 至 18 岁的首发癫痫儿童 (53 例) 和健康对照组 (n=50) 进行评估。结果表明癫痫组儿童总分、行为管理指数及元认知指数得分均高于对照组, 而得分越高, 提示其执行功能受损越严重。Modi 等<sup>[29]</sup>也曾对 237 个癫痫患者进行 BRIEF 量表测试, 结果示 54% 患者存在执行功能的损害, 其中 29% 的患者存在全面执行功能缺陷, 8% 患者存在 (行为调节+工作记忆) 缺陷, 表现在抑制、转移、情绪控制和工作记忆方面出现困难, 元认知缺陷 (启动、工作记忆和计划) 占 17%。

### 3 ADHD 患者的执行功能

研究发现 ADHD 患者存在前额叶、纹状体、丘脑功能不足, 这些部位功能障碍导致了其反应抑制受损<sup>[30-31]</sup>, 相关研究也表明 ADHD 最突出的障碍之一就是执行功能的障碍<sup>[32]</sup>。先后有学者提出 ADHD 的核心缺损是反应抑制<sup>[33]</sup>和工作记忆的<sup>[34]</sup>缺损, 然而无论是反应抑制或是工作记忆皆提示执行功能的广泛损害。Tan 等<sup>[35]</sup>对 42 例 ADHD 患者 (ADHD-I 21 例、ADHD-C 21 例) 和 21 例健康儿童 (HC) 进行执行功能对比分析, 结果示与 HC 组相比, ADHD 组儿童的行为管理指数 (抑制、转换、情绪控制)、元认知指数 (任务启动、工作记忆、计划、组织、监控) 都明显增高, 多数表现为元认知指数的损害, 而行为管理指数在 ADHD-C 组显著高于 ADHD-I 组和 HC 组, 特别是抑制因子, 提示可能与多动、冲动的症状显著相关, 这与既往的研究结果一致<sup>[36-37]</sup>。Bauer 等<sup>[38]</sup>发现 ADHD 患者的反应抑制和工作记忆较对照组弱, 而工作记忆的损害会加重 ADHD 患者的负面情绪, 增加其自杀风险, 因此记忆工作的损害可作为评估 ADHD 患者自杀意念的早期危险因素。Krieger 等<sup>[39]</sup>进一步证实了 ADHD 儿童和青少年在工作记忆、抑制和计划任务方面的表现差于对照组。Skogli 等<sup>[40]</sup>对 44 名 ADHD-I、36 名 ADHD-C、50 名健康对照组使用语言流畅性测试、色词干扰实验、连线测试评估所有参与人员的语言流畅性、控制注意力和认知灵活性, 结果示实验组的儿童和青少年在语言流畅性方面表现出更明显的功能受损, ADHD-I 组在控制注意力和认知灵活性方面比对照组表现出更明显的受损。Coghill 等<sup>[41]</sup>研究者对注意缺陷多动障碍患者进行记忆、延迟厌恶、时间、抑制、决策和可变性全面综合分析提示实验组儿童表现均不如对照组, 他们还利用英国图片词汇量表-第二版 (BPVS-II) 评估患者的语言能力, 提示其得分低于健康儿童。

### 4 癫痫共患 ADHD 对执行功能的影响

综上所述, 癫痫和注意缺陷多动与多动障碍作为儿童时期常见的神经性障碍疾病, 皆可对患者的执行功能造成不同程度上的损害。而共患病的存在不仅加重了患者的诊治, 对患者执行功能的损害也较单纯癫痫或注意缺陷与多动障碍患者更严重。MacAllister 等人<sup>[42]</sup>利用韦氏对不同亚型 ADHD 共患癫痫的研究结果提示, ADHD-I 型和 ADHD-C 型共患癫痫组的总智商、言语理解指数、感知推理指低于无共患 ADHD 的癫痫组。Kang Sung-Han 等<sup>[43]</sup>研究发现癫痫共患 ADHD 组儿童较单纯癫痫、ADHD 组表现出更差的听觉注意力和工作记忆。这与之前的研究结论一致<sup>[44]</sup>。陈静等<sup>[45]</sup>

使用 BRIEF 量表对 30 例癫痫共患 ADHD 组、49 例单纯癫痫组以及 52 例健康儿童评估发现, 癫痫共患 ADHD 组患者在情绪控制、抑制、转换、工作记忆、任务启动、组织和监控、计划以及 BRIEF 总分上均高于非共患组, Lima 等<sup>[46]</sup>研究结果认为共患 ADHD 是 BECT 患儿注意功能和执行功能的决定因素。房海波等人<sup>[47]</sup>通过视听整合连续测试评估发现 BECT 共患 ADHD 患者的听觉反应控制商数、综合反应控制商数、听觉注意力商数得分均低于 ADHD 组患者, 综合反应控制商数较 BECT 组得分低, 这些结果都提示了当两种疾病共存时, 对患者的功能损害较无共患病时更大。儿童尤其学龄期时儿童是智力发育的关键时期, 轻微的认知障碍也可能对学业成绩产生重大影响, 并产生持久和长远的影响, 当癫痫和 ADHD 两种疾病共同存在时, 对患者执行功能的损害更大, 因此共患病成为疾病诊治与预后的重要影响因素。

## 5 展望

尽管目前关于癫痫及 ADHD 患者存在全面执行功能受损已经得到了大量的研究证实。但癫痫共患 ADHD 的发生机制、对患者行为、认知和执行功能的影响还未得到更为具体的阐述, 因此, 对于癫痫共患 ADHD 执行功能的损害进行进一步探讨, 为患者的早期诊治、药物治疗、心理干预及预后提供更多的数据支持成为必要。

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**收稿日期:** 2022 年 7 月 1 日

**出刊日期:** 2022 年 9 月 2 日

**引用本文:** 刘美燕, 王荣, 癫痫共患注意缺陷与多动障碍 (ADHD) 患儿执行功能的研究[J]. 国际临床研究杂志, 2022, 6(7): 48-52.

DOI: 10.12208/j.ijcr.20220304

**检索信息:** RCCSE 权威核心学术期刊数据库、中国知网 (CNKI Scholar)、万方数据 (WANFANG DATA)、Google Scholar 等数据库收录期刊

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