·临床研究·

老年失眠共病阻塞性睡眠呼吸暂停患者睡眠监测及记忆功能受损研究

杨艳娟*
(邯郸市第一医院神经内科,河北 邯郸 056004)

【摘 要】 **目的** 研究老年失眠共病阻塞性睡眠呼吸暂停(COMISA)患者睡眠参数与记忆功能受损之间的关联性。**方法** 选取2024年6月至2025年6月邯郸市第一医院神经内科收治的86例老年单纯慢性失眠患者作为失眠组,74例合并阻塞性睡眠呼吸暂停(OSA)的失眠患者作为COMISA组,并选取健康体检部同期接收的30例无失眠症老年人作为对照组。所有研究对象均行多导睡眠监测(PSG),记录全夜睡眠呼吸暂停指数(AHI)、最低血氧饱和度($LSpO_2$)、非快速眼动睡眠期(NREM)、快速眼动睡眠期(REM)、睡眠总时间(TST)、入睡潜伏期(SL)、睡眠效率(SE)等睡眠参数,采用匹兹堡睡眠质量量表(PSQI)及失眠严重程度指数量表(ISI)评估主观睡眠质量,蒙特利尔认知评估量表(MoCA)评估整体认知功能,临床记忆量表(CMS)评估记忆功能。采用SPSS 26.0统计软件进行数据分析,根据数据类型,组间比较分别采用χ^2检验或单因素方差分析,采用Pearson相关系数分析COMSIA组患者睡眠参数与CMS量表得分之间的相关性;以COMSIA患者CMS量表总得分为因变量,采用多元线性回归模型分析影响患者CMS量表总得分的相关因素。**结果** COMISA组及失眠组患者的PSQI及ISI量表得分均低于对照组,SL高于对照组,TST、SE、NREM3占比低于对照组;CMOISA组患者AHI高于失眠组及对照组,REM占比及$LSpO_2$水平低于失眠组及对照组,CMOISA组NREM3占比低于失眠组,以上差异均有统计学意义(均$P<0.05$)。COMISA组及对照组的MoCA量表得分、CMS量表总得分及其各维度得分均低于对照组,轻度认知功能障碍(MCI)及记忆障碍检出率均高于对照组,且COMISA组患者MoCA量表得分、CMS量表总得分及其各维度得分均低于失眠组,MCI及记忆障碍检出率均高于单纯失眠组,以上差异均有统计学意义(均$P<0.05$)。Pearson相关分析提示CMOISA组患者NREM3与图像自由回忆及CMS量表总得分之间呈正相关($r=0.516,0.415$;均$P<0.001$),REM与指向记忆、联想记忆及CMS量表总得分之间呈正相关($r=0.403,0.407,0.504$;均$P<0.001$),AHI与联想记忆及CMS量表总得分之间呈负相关($r=0.389,0.398$;均$P<0.05$),$LSpO_2$水平与CMS量表总得分之间呈正相关($r=0.431$;$P<0.001$)。以CMOISA患者CMS量表总得分为因变量,线性回归分析结果显示,NREM3($\beta=0.146$,95%*CI* 0.012~0.229;$P<0.001$)、REM($\beta=0.178$,95%*CI* 0.007~0.184;$P<0.001$)对COMISA患者CMS量表得分具有正向预测作用,AHI($\beta=-0.084$,95%*CI* −0.345~−0.009;$P<0.001$)对CMS量表得分具有负向预测作用。**结论** 老年失眠患者及CMOISA患者均出现主观睡眠质量下降及客观睡眠结构异常表现,且整体认知功能及记忆功能均有所下降,但CMOISA患者客观睡眠结构异常表现更为严重,整体认知功能及记忆功能受损程度更高,睡眠参数是影响COMISA患者记忆功能的相关因素。

【关键词】 老年人;失眠共病阻塞性睡眠呼吸暂停;多导睡眠监测;睡眠参数;记忆功能
【中图分类号】 R749.79;R562.1 【文献标志码】 A 【DOI】 10.11915/j.issn.1671-5403.2026.09.137

Sleep monitoring and memory impairment in elderly patients with comorbid insomnia and obstructive sleep apnoea

Yang Yanjuan*
(Department of Neurology, Handan First Hospital, Handan 056004, Hebei Province, China)

【**Abstract**】 **Objective** To investigate the association between sleep parameters and memory impairment in elderly patients with comorbid insomnia and obstructive sleep apnoea (COMISA). **Methods** From June 2024 to June 2025, 86 elderly patients with simple chronic insomnia admitted to the Department of Neurology of Handan First Hospital were selected as the insomnia group, 74 insomnia patients with comorbid obstructive sleep apnea (OSA) as the COMISA group, and 30 elderly people without insomnia received by the Health Examination Department during the same period the control group. All study subjects underwent polysomnography (PSG). Sleep parameters were recorded, including apnea hyponea index (AHI), lowest pulse oxygen saturation (LSpO2), non-rapid eye movement (NREM), rapid eye movement (REM), total sleep time (TST), sleep latency (SL), and sleep efficiency (SE). Pittsburgh sleep

收稿日期: 2025-10-09; **接受日期**: 2025-12-16
基金项目: 邯郸市科学技术研究与发展计划(24500069896)
通信作者: 杨艳娟, E-mail: yangyanj898@163.com

quality inventory (PSQI) and insomnia severity index (ISI) were used to evaluate the subjective sleep quality. Montreal cognitive assessment (MoCA) scale was used to evaluate the overall cognitive function, and clinical memory scale (CMS) to evaluate the memory function. SPSS 26.0 was used for data analysis. According to the data type, *Chi*-square test or one-way analysis of variance was performed for comparison between groups. Pearson correlation coefficient analysis was conducted to analyze the correlations between sleep parameters and CMS scores in the COMSIA group. With the total score of CMS in COMSIA patients as the dependent variable, and multivariate linear regression model was adopted to analyze the factors affecting the total score of CMS. **Results** The PSQI and ISI scores in the COMISA group and the insomnia group were lower than those in the control group; the SL was higher while the TST, SE and proportion of NREM3 were lower than those in the control group.The AHI in the CMOISA group was higher than that in the insomnia group and the control group. The proportion of REM and $LSpO_2$ level were lower than those in the insomnia group and the control group. The proportion of NREM3 in the CMOISA group was lower than that in the insomnia group (all $P<0.05$). The score of MoCA scale and total score and scores of dimensions of CMS in COMISA group and insomnia group were lower than those in control group while the detection rates of mild cognitive impairment (MCI) and memory impairment were higher, and the score of MoCA scale and scores of dimensions and total score of CMS in COMISA group were lower while the detection rates of MCI and memory impairment were higher than those in insomnia group (all $P<0.05$). Pearson correlation analysis suggested that in the CMOISA group, NREM3 was positively correlated with free recall of pictures and the total score of CMS ($r=0.516$, 0.415; both $P<0.001$); REM was positively correlated with directed memory score, associative memory score and total CMS ($r=0.403$, 0.407, 0.504; all $P<0.001$); AHI was negatively correlated with associative memory and total CMS ($r=0.389$, 0.398; both $P<0.05$); and $LSpO_2$ was positively correlated with total CMS ($r=0.431$; $P<0.001$). With total CMS in CMOISA patients as the dependent variable, linear regression analysis results revealed that NREM3 ($\beta=0.146$, 95%*CI* 0.012-0.229; $P<0.001$) and REM ($\beta=0.178$, 95%*CI* 0.007-0.184; $P<0.001$) could positively predict the CMS in COMISA patients, while AHI ($\beta=-0.084$, 95%*CI* -0.345--0.009; $P<0.001$) could negatively predict the CMS in COMISA patients. **Conclusion** Elderly patients with insomnia and elderly patients with CMOISA show decreased subjective sleep quality and abnormal objective sleep structure. In addition, the overall cognitive function and memory function declined, and patients with CMOISA have more severe abnormal objective sleep structure and a higher degree of impairment in overall cognitive function and memory function. Sleep parameters are factors affecting the memory function in patients with COMISA.

【**Key words**】 aged; comorbid insomnia and sleep apnoea; polysomnography monitoring; sleep parameters; memory function

This work was supported by Handan Science and Technology Research and Development Program (24500069896).

Corresponding author: *Yang Yanjuan*, *E-mail*: *yangyanj898@163.com*

失眠与阻塞性睡眠呼吸暂停(obstructive sleep apnea, OSA)均是临床常见的睡眠障碍性疾病。现有研究数据显示,慢性失眠患者中 OSA 患病率为 13.6%~77.5%,OSA 患者中合并失眠者占比 23.4%~88.0%[1,2]。当两种疾病共同存在时,该病症被定义为失眠共病阻塞性睡眠呼吸暂停(comorbid insomnia and sleep apnoea, COMISA)。与单纯性失眠及 OSA 不同的是,在失眠与 OSA 交互作用下,COMISA 患者更易出现不良临床结局[3]。有研究证实,失眠及 OSA 均会对认知功能造成损伤[4,5],其中记忆力作为中枢神经系统高级功能的重要组成部分,记忆力减退是认知功能障碍的主要临床表现,而良好的睡眠是维持个体正常学习与记忆活动的关键基础[6]。但目前关于 COMISA 患者认知功能及记忆功能受损程度是否高于单病种患者,以及该人群睡眠结构特征与记忆功能之间的相关性研究仍较为有限,基于此,本研究将分析探讨 COMISA 患者睡眠参数与记忆功能受损之间的相关性,旨在为 COMISA 患者的临床干预提供参考依据。

1 对象与方法

1.1 研究对象

选取 2024 年 6 月至 2025 年 6 月邯郸市第一医院神经内科收治的 86 例老年单纯慢性失眠患者作为失眠组,74 例合并 OSA 的失眠患者作为 COMISA组,并选取健康体检部同期接收的 30 例无失眠症老年人作为对照组。本研究经邯郸市第一医院伦理委员会批准(批准文号:2024-KZ-3319),所有研究者均签署书面知情同意书,研究符合《赫尔辛基宣言》。

1.1.1 诊断标准 失眠参照中国成人失眠诊断与治疗指南(2017 版)诊断标准[7],患者同时符合以下 5 点即可诊断为慢性失眠:(1)出现入睡困难、睡眠维持困难、早醒等睡眠紊乱症状;(2)出现疲乏感、注意力、工作或学习能力下降,日间瞌睡、冲动行为等日间功能受损症状;(3)失眠症无法单纯用不恰当睡眠环境和睡眠时间解释;(4)睡眠紊乱和日间功能受损每周至少发作 3 次且症状至少 3 个月;

(5)睡眠紊乱和日间功能受损症状无法用其他类型的睡眠障碍解释。OSA诊断标准[8]:患者经多导睡眠监测(polysomnography, PSG)全夜睡眠呼吸暂停指数(apnea hypopnea index, AHI)≥5次/h,且至少存在以下任意一种临床症状,白天嗜睡或疲劳、晚上屏住呼吸、目睹呼吸暂停或大声打鼾。

1.1.2 纳入标准 失眠患者纳入标准:年龄≥60岁;符合失眠相关诊断标准;匹兹堡睡眠质量量表(Pittsburgh sleep quality index, PSQI)得分≥8分;COMISA组患者同时符合OSA诊断标准;受教育年限≥6年,可配合完成相关研究;惯用手为右手;行PSG监测。对照组纳入标准:年龄≥60岁;睡眠状况良好;PSQI得分≤7分;PSG监测提示AHI<5次/h;受教育年限≥6年;惯用手为右手。

1.1.3 排除标准 周期性肢体运动障碍、发作性睡病及其他类型睡眠障碍;合并脑梗死、痴呆、癫痫等神经系统疾病;合并焦虑症、抑郁症、精神分裂症等精神疾病;合并严重脏器功能不全;明显视听力障碍及理解功能障碍;酗酒、药物滥用史;PSG监测时间<4 h。

1.2 方法

1.2.1 PSG监测 研究对象来诊当晚在睡眠中心,按照日常作息进行整晚的PSG监测,监测当晚不得饮酒、茶或咖啡,不得服用镇静催眠性药物,记录以下参数:(1)呼吸相关生理指标包括口鼻热敏电阻压力、鼻气流、胸腹呼吸运动、最低血氧饱和度(lowest pulse oxygen saluration, $LSpO_2$)、AHI;(2)睡眠分期参数包括非快速眼动睡眠(non-rapid eye movement, NREM)1期、2期、3期,快速眼动睡眠期(rapid eye movement, REM);(3)睡眠宏观结构参数包括睡眠总时间(total sleeptime, TST)、入睡潜伏期(sleep latency, SL)、睡眠效率(sleep efficiacy, SE)及睡眠各阶段所占百分比。

1.2.2 量表测试 研究对象入组后,在安静的环境中进行量表测试,由工作人员采用统一用语向研究对象说明研究目的、内容及保密性,要求研究对象如实填写问卷内容,问卷填写完毕后当场回收,由工作人员对问卷进行复查审核,发现漏填项目及时回访补填,确保调查结果的可靠性。

1.2.3 主观睡眠质量评估 (1)PSQI量表[9]:包含睡眠质量、睡眠时间、睡眠效率、睡眠障碍、催眠药物、日间功能障碍等7个维度,量表总得分0~21分,PSQI总得分≥8分即存在睡眠障碍;(2)失眠严重程度指数量表(insomnia severity index, ISI)[10]:包含入睡困难、早醒、睡眠维持困难的严重程度、睡眠满意度、对失眠症状的焦虑及失眠对日间生活的影响程度等7个维度,量表总得分0~28分,其中0~7分为无临床意义的失眠,8~14分为亚临床失眠,15~21分为中度临床失眠,22~28分为重度临床失眠。

1.2.4 认知功能评估 (1)整体认知功能评估:采用蒙特利尔认知评估量表(Montreal cognitive assessment scale, MoCA)[11]评估研究对象整体认知功能,当受试者受教育年限<12年时,MoCA总得分≤26分即存在轻度认知功能障碍(mild cognitive impairment, MCI);(2)记忆能力评估:采用临床记忆量表(clinical memory scale, CMS)[12]评估研究对象记忆功能,量表包含指向记忆、联想学习、图像自由回忆、无意义图形再认、人像特点回忆联系等5项内容,将5项分测验的原始分换算成量表分,再按年龄组查表得到记忆商(memory quotient, MQ)分值,MQ<70分为记忆障碍,≥70分为无记忆障碍。

1.3 统计学处理

采用SPSS 26.0统计软件进行数据分析。计量资料行正态性和方差齐性检验,符合正态分布的计量资料用均值±标准差($\bar{x}\pm s$)表示,多组间比较采用单因素方差分析,多重比较采用LSD-t检验;计数资料用例数(百分率)表示,组间比较用χ^2检验,多组间两两比较采用Bonferroni法对检验水准进行校正。采用Pearson相关系数分析COMSIA组患者睡眠参数与CMS量表得分之间的相关性。以COMSIA患者CMS量表总得分为因变量,采用多元线性回归模型分析影响患者CMS量表总得分的相关因素。P<0.05为差异有统计学意义。

2 结 果

2.1 三组患者一般人口学资料及主观睡眠质量

三组患者PSQI、ISI量表得分组间差异有统计学意义,其中COMISA组及失眠组PSQI、ISI量表得分均高于对照组(均P<0.05);其余一般人口学资料、不良习惯、基础性疾病比较,差异无统计学意义(均P>0.05;表1)。

2.2 三组患者PSG监测结果

三组患者PSG监测结果比较,除NREM1占比、NREM2占比三组间差异无统计学意义外(均P>0.05),其余指标三组间总体差异均有统计学意义(均P<0.05)。两两比较结果显示,COMISA组与失眠组TST、SE低于对照组,SL长于对照组;COMISA组NREM3占比低于失眠组,且均低于对照组;COMISA组REM占比及$LSpO_2$均低于失眠组及对照组,AHI高于失眠组及对照组(均P<0.05;表2)。

表 1 三组患者一般人口学资料及主观睡眠质量比较

Table 1 Comparison of general demographic data and subjective sleep quality among three groups

Item	COMISA group(n=74)	Insomnia group(n=86)	Control group(n=30)	F/χ^2	P value
Gender[n(%)]				0.045	0.978
Male	30(40.54)	36(41.86)	12(40.00)		
Female	44(59.46)	50(58.14)	18(60.00)		
Age(years, $\bar{x}\pm s$)	66.79±4.16	67.31±4.03	67.15±4.63	0.245	0.783
Years of education(years, $\bar{x}\pm s$)	11.49±2.19	12.07±2.25	12.24±2.27	1.953	0.145
Body mass index(kg/m^2, $\bar{x}\pm s$)	23.15±2.73	22.74±2.41	22.87±2.63	0.412	0.663
Bad habits[n(%)]					
Smoking history	27(36.49)	25(29.07)	9(30.00)	1.076	0.584
Alcohol drinking history	20(27.03)	22(25.58)	7(23.33)	0.156	0.925
Underlying diseases[n(%)]					
Diabetes mellitus	10(13.51)	13(15.12)	4(13.33)	0.106	0.948
Hypertension	11(14.86)	9(10.47)	4(13.33)	0.714	0.700
Hyperlipidemia	5(6.76)	8(9.30)	3(10.00)	0.449	0.799
Coronary heart disease	2(2.70)	4(4.65)	2(6.67)	0.707	0.635
Lung disease	2(2.70)	2(2.33)	1(3.33)	0.091	0.956
Subjective sleep quality(points, $\bar{x}\pm s$)					
PSQI	9.37±1.63*	9.64±1.75*	6.52±1.84	62.214	<0.001
ISI	13.46±2.27*	13.39±2.34*	6.13±1.79	243.112	<0.001

COMISA: comorbid insomnia and sleep apnoea; PSQI: Pittsburgh sleep quality index; ISI: insomnia severity index. Compared with control group, *P<0.05.

表 2 三组患者 PSG 监测结果比较

Table 2 Comparison of PSG monitoring results among three groups ($\bar{x}\pm s$)

Item	COMISA group(n=74)	Insomnia group(n=86)	Control group(n=30)	F	P value
TST(min)	407.15±45.34*#	409.27±49.39*	448.15±51.46	13.824	<0.001
SL(min)	43.86±12.45*#	45.02±13.05*	16.81±11.74	104.188	<0.001
SE(%)	76.37±15.66*#	77.45±16.37*	89.45±15.96	13.011	<0.001
NREM1(%)	27.35±4.36	28.11±4.53	28.24±4.83	0.697	0.499
NREM2(%)	51.46±6.79	50.31±7.26	49.33±6.68	1.502	0.225
NREM3(%)	1.89±0.49*#	2.31±0.37*	5.61±0.53	1 195.976	<0.001
REM(%)	12.36±3.3*#	15.19±3.54	15.54±3.61	15.783	<0.001
AHI(times/min)	17.35±3.37*#	3.89±0.67	3.63±0.41	974.881	<0.001
$LSpO_2$(%)	82.45±2.13*#	94.45±3.19	95.01±2.93	381.310	<0.001

PSG: polysomnography; COMISA: comorbid insomnia and sleep apnoea; TST: totalsleeptime; SL: sleep latency; SE: sleep efficiacy; NREMR: non-rapid eye movement; REM: rapid eye movement; AHI: apnea hypopnea index; $LSpO_2$: lowest pulse oxygen saluration. Compared with control group, *P<0.05; compared with insomnia group, #P<0.05.

2.3 三组患者主观认知功能及记忆功能

三组患者主观认知功能及记忆功能比较，COMISA 组及失眠组 MoCA 量表得分、CMS 量表总得分及各维度得分均低于对照组，MCI 检出率及记忆障碍检出率均高于对照组，且 COMISA 组 MoCA 量表得分、CMS 量表总得分及各维度得分均低于失眠组，MCI 检出率及记忆障碍检出率均高于失眠组，以上差异均有统计学意义(均 P<0.05；表 3)。

2.4 COMISA 组患者睡眠参数与记忆功能相关性分析

Pearson 相关性分析结果显示，CMOISA 组患者 NREM3 占比与图像自由回忆及 CMS 量表总得分呈正相关，REM 占比与指向记忆、联想记忆及 CMS 量表总得分呈正相关，AHI 与联想记忆及 CMS 量表总得分呈负相关，$LSpO_2$水平与 CMS 量表总得分呈正相关(均 P<0.05；表 4)。

2.5 COMISA 组患者 CMS 量表得分影响因素分析

以 CMOISA 患者 CMS 量表总得分为因变量，表 4中有统计学意义的指标为自变量，构建多因素线性回归模型，在校正年龄、性别、受教育年限等混杂因素后，结果显示 NREM3(β=0.146, 95% CI 0.012~0.229; P<0.001)、REM(β=0.178, 95% CI 0.007~0.184; P<0.001)对 COMISA 患者 CMS 量表得分具有正向预测作用，AHI(β=−0.084, 95% CI −0.345~−0.009; P<0.001；表 5)对 CMS 量表得分具有负向预测作用。

表3 三组患者主观认知功能及记忆功能比较

Table 3 Comparison of subjective cognitive function and memory functionamong three groups

Item	COMISA group(n=74)	Insomnia group(n=86)	Control group(n=30)	F/χ^2	P value
MoCA scale(points, $\bar{x}\pm s$)	23.69±2.61 *	25.18±3.32 *	27.69±2.93	29.322	<0.001
Detection rate of MCI[n(%)]	46(62.16) #	35(40.70) *	3(10.00)	24.334	<0.001
CMS scale(points, $\bar{x}\pm s$)					
Directed memory	11.14±2.07 *#	12.69±2.25 *	19.45±3.12	193.975	<0.001
Associative learning	12.76±1.89 *#	14.21±1.94 *	18.65±2.21	146.099	<0.001
Image freememory	13.35±2.26 *#	15.49±2.29 *	21.73±2.45	219.730	<0.001
Meaningless figure recognition	15.41±3.07 *#	17.15±2.86 *	22.27±3.15	111.712	<0.001
Portrait characteristics recall association	12.22±2.25 *#	14.07±2.19 *	19.89±2.43	192.654	<0.001
Total	64.88±10.32 *#	73.61±11.24 *	101.99±12.35	186.375	<0.001
Detection rate of memory impairment[n(%)]	66(89.19) *#	45(52.33) *	4(13.33)	55.832	<0.001

COMISA: comorbid insomnia and sleep apnoea; MoCA: Montreal cognitive assessment scale; MCI: mild cognitive impairment; CMS: clinical memory scale. Compared with control group, * $P<0.05$; compared with insomnia group, # $P<0.05$ (enumeration data corrected by Bonferroni method, # $P<0.016$).

表4 COMISA组患者睡眠参数与记忆功能的相关性分析

Table 4 Correlation analysis between sleep parameters and memory function in COMISA patients

Sleep parameter	Directed memory	Associative learning	Image freememory	Meaningless figure recognition	Portrait characteristics recall association	Total
TST	0.149	0.164	0.134	0.084	0.155	0.123
NREM1	0.215	0.137	0.163	0.097	0.127	0.084
NREM2	0.146	0.134	0.178	0.264	0.137	0.165
NREM3	0.119	0.159	0.516 **	0.194	0.297	0.415 **
SL	0.207	0.143	0.205	0.187	0.194	0.213
REM	0.403 **	0.407 **	0.187	0.194	0.174	0.504 **
SE	0.087	0.094	0.113	0.157	0.211	0.119
AHI	0.099	−0.389 *	−0.153	0.193	0.187	−0.398 *
$LSpO_2$	0.131	0.078	0.156	0.029	0.078	0.431 **

COMISA: comorbid insomnia and sleep apnoea; TST: totalsleeptime; NREMR: non-rapid eye movement; SL: sleep latency; REM: rapid eye movement; SE: sleep efficiacy; AHI: apnea hypopnea index; $LSpO_2$: lowest pulse oxygen saluration. * $P<0.05$, ** $P<0.001$.

表5 COMISA组患者CMS量表得分多因素线性回归分析

Table 5 Multivariate linear regression analysis of CMS scale score in COMISA patients

Variable	β	SE	Standardized β	95%CI	t	P value
NREM3	0.146	0.035	0.041	0.012−0.229	5.415	<0.001
AHI	−0.084	0.024	−0.023	−0.345−−0.009	−4.379	<0.001
REM	0.178	0.043	0.035	0.007−0.184	5.846	<0.001
$LSpO_2$	0.213	0.044	0.154	0.019−0.465	1.841	0.245

CMS: clinical memory scale; COMISA: comorbid insomnia and sleep apnoea; NREM: non-rapid eye movement; AHI: apnea hypopnea index; REM: rapid eye movement; $LSpO_2$: lowest pulse oxygen saluration.

3 讨 论

本研究结果显示,在基线资料均衡可比的情况下,COMISA组及失眠组患者主观睡眠质量,包括PSQI及ISI量表总得分均显著高于对照组,而COMISA组与失眠组上述两项量表总得分差异无统计学意义。以上结果提示,COMISA及失眠患者均存在明显的主观睡眠障碍表现,但两者之间差异不明显,说明合并OSA并未加重患者主观睡眠质量的损害,该结论与前期部分已发表的研究结论相悖[13],考虑可能与本研究样本量较小,且主观睡眠质量评估工具测量结果的准确性易受到研究对象文化背景、个体差异与评估场景等因素影响有关。

本研究采用PSG监测研究对象的客观睡眠质量,结果显示各组的睡眠结构及相关参数存在显著的组间差异,其中COMISA组及失眠组患者SL水平高于对照组,TST、SE、NREM3占比均低于对照组,提示失眠及COMISA患者均存在总睡眠时间缩短、深睡眠时间减少、入睡潜伏期延长等特点,该结果与失眠的典型睡眠特征一致。COMISA组患者表现出AHI升高、$LSpO_2$水平下降,符合OSA的病理特征。此外,与失眠组患者相比,COMISA组患者NREM3及REM占比均降低,提示相比于失眠者,COMISA患者存在深睡眠及快波睡眠占比进一步下降的改变。

随着我国人口老龄化进程加快及医学技术的不断发展,由睡眠障碍引起的认知功能损害逐渐受到临床的重视。现有研究显示,睡眠障碍与阿尔茨海默病及认知功能下降相关,关注老年失眠患者认知功能损害情况,对预防甚至延缓老年人群认知功能受损、改善远期预后具有重要的临床价值[14,15]。本研究结果显示,相较于无失眠的对照组老年人,COMISA组及失眠组患者MoCA量表得分均显著降低,MCI检出率显著升高,提示失眠及COMISA患者的认知功能损害情况更严重。此外,COMISA组

患者MoCA 量表得分低于失眠组患者,MCI 检出率高于失眠组患者,提示 COMISA 患者的整体认知功能损害程度更为严重。

记忆力下降是认知功能障碍的主要临床表现,已有大量研究证实睡眠与记忆力之间存在密切关联。现有证据表明,睡眠可加强已形成的记忆,同时支持记忆在海马与新皮层之间转化,并将新皮层中的记忆整合为更为广泛的联系;此外,睡眠还可使个体觉醒学习阶段神经环路中广泛增强的突触连接适当减弱[16]。另有研究指出,睡眠剥夺将扰乱脑内神经递质分布,破坏脑内神经网络的结构平衡,进而导致个体记忆能力下降[17]。

本研究结果显示,相较于无失眠的对照组老年人群,CMOISA 组及失眠组患者 CMS 量表各维度及总得分均有所下降,而记忆障碍检出率升高,提示老年失眠患者在记忆广度、知觉反应速度及注意分辨操作能力等维度的表现均差于无失眠者。此外,与失眠组患者相比,CMOISA 组 CMS 量表总得分及各维度得分均更低,记忆障碍检出率更高,提示 CMOISA 组患者的记忆力损害情况较失眠者更为严重,该结果应当引起临床重视。

相关性分析结果显示,CMOISA 组患者 NREM3 占比与图像自由回忆及 CMS 量表总得分呈正相关,REM 占比与指向记忆、联想记忆及 CMS 量表总得分呈正相关,AHI 与联想记忆及 CMS 量表总得分呈负相关,$LSpO_2$ 水平与 CMS 量表总得分呈正相关,提示CMOISA 患者的异常睡眠参数与其记忆力水平存在一定的关联性。进一步构建线性回归模型分析 COMISA 组患者记忆损害的影响因素发现,NREM3、REM 对 COMISA 患者 CMS 量表得分具有正向预测作用,AHI 对 CMS 量表得分具有负向预测作用,说明深度睡眠时间减少、REM 比例降低、AHI 水平升高是影响 CMOISA 患者记忆功能的独立影响因素。

综上,相较于无失眠的老年人群,失眠患者及 CMOISA 患者均存在主观睡眠质量降低及客观睡眠结构异常的表现,且整体认知功能及记忆功能均出现下降,其中 CMOISA 患者较失眠患者更为显著,NREM3、REM 及 AHI 是影响 CMOISA 患者记忆功能的独立影响因素。本研究因可配合完成 PSG 监测的病例招募难度较高,纳入样本量较小,所得结论可能存在一定的选择偏倚;同时受限于研究条件,本研究未能进一步探讨 NREM3、REM 及 AHI 等睡眠参数与记忆力减退之间的具体作用机制,存在一定的局限性。

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(编辑: 龚志忠)