

· 临床研究 ·

老年结肠慢传输型便秘患者肠道神经递质变化及精神心理状态

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【摘要】目的 调查老年结肠慢传输型便秘(STC)患者的肠道神经递质变化、精神心理状态及生活质量。**方法** 将四川大学华西医院广安医院肛肠科 2020 年 12 月至 2022 年 12 月间收治的 115 例老年结肠 STC 患者纳入观察组,同期健康体检部接收的 90 名无胃肠道疾病的同龄老年人作为对照组。采集受试者外周静脉血,检测血清 P 物质(SP)、一氧化氮(NO)及 5-羟色氨酸(5-HT)等肠道神经递质水平。采用 90 项症状自评量表(SCL-90)评估受试者精神心理状态,简明健康状况调查问卷(SF-36)评估受试者生活质量。对观察组患者进行为期 6 个月的精神心理干预,评估干预前后患者血清肠道神经递质水平、SCL-90 及 SF-36 得分情况。采用 SPSS 20.0 统计软件进行数据分析。采用 Pearson 相关系数分析老年结肠 STC 患者血清神经递质水平与 SCL-90 各因子之间的相关性。**结果** 观察组患者血清 SP 及 5-HT 水平显著低于对照组,NO 水平显著高于对照组,差异均有统计学意义(均 $P < 0.05$)。观察组患者 SCL-90 中躯体化、人际关系敏感、抑郁、焦虑因子得分以及量表总平均分均显著高于对照组,SF-36 中 RP、GH、VT、MH 维度得分以及问卷总得分均显著低于对照组,差异均有统计学意义(均 $P < 0.05$)。Pearson 相关性分析提示,观察组患者血清 SP 与 SCL-90 中躯体化、人际关系敏感以及焦虑因子得分呈负相关($r = -0.243, -0.276, -0.311; P < 0.05$),血清 NO 水平与躯体化及焦虑因子得分呈正相关($r = 0.247, 0.283; P < 0.05$),血清 5-HT 水平与人际关系敏感及焦虑因子得分呈负相关($r = -0.369, -0.363; P < 0.05$)。经精神心理干预后,观察组患者血清神经递质 SP 及 5-HT 水平显著上升,血清 NO 水平显著下降,精神心理状况 SCL-90 量表总平均分显著下降,生活质量 SF-36 问卷总得分显著上升,差异均有统计学意义(均 $P < 0.05$)。**结论** 老年结肠 STC 患者生活质量与同龄无胃肠道疾病的对照组相比明显下降,精神心理障碍更严重,且存在肠道兴奋性递质分泌减少、抑制性递质分泌增多表现。老年结肠 STC 患者血清神经递质水平与其精神心理障碍之间具有相关性,调节患者精神心理状态可在一定程度上改善其肠道神经递质水平异常,提高患者生活质量。

【关键词】 老年人;结肠慢传输型便秘;肠道神经递质;心理学;生活质量

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Intestinal neurotransmitters and mental and psychological state of elderly patients with slow-transit constipation

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【Abstract】Objective To investigate the changes in the intestinal neurotransmitters, mental and psychological state, and quality of life in the elderly patients with slow-transit constipation (STC). **Methods** A total of 115 elderly STC patients in the Department of Anorectal Surgery of Guang'an Hospital of West China Hospital affiliated to Sichuan University from December 2020 to December 2022 were included in the observation group, and 90 age-matched elderly individuals without gastrointestinal diseases in the Physical Examination Department during the same period were enrolled as the control group. Peripheral venous blood was collected from the subjects to detect the levels of intestinal neurotransmitters including serum substance P (SP), nitric oxide (NO), and 5-hydroxytryptophan (5-HT). The symptom check-list 90 (SCL-90) was used to assess the mental and psychological status of the subjects, and MOS short-form-36 health survey (SF-36) was used to assess their quality of life. The patients in the observation group were given mental and psychological intervention for 6 months, and the serum intestinal neurotransmitters, SCL-90 scores and SF-36 scores were evaluated before and after the intervention. SPSS 20.0 was used for data processing and analysis. Pearson correlation coefficient was used to

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analyze the correlation between levels of serum neurotransmitters and SCL-90 dimensions in the elderly STC patients. **Results** The levels of serum SP and 5-HT in the observation group were significantly lower than those in the control group, the NO level was significantly higher than that in the control group, and the differences were statistically significant ($P<0.05$). The scores for somatization, interpersonal sensitivity, depression and anxiety and total score on SCL-90 in the observation group were significantly higher than the control group, the scores for RP, GH, VT and MH and total score on SF-36 were significantly lower than those in the control group, and the differences were statistically significant ($P<0.05$). Pearson correlation analysis indicated that serum SP in the observation group was negatively correlated with scores for somatization, interpersonal sensitivity, and anxiety of SCL-90 ($r=-0.243, -0.276, -0.311$; $P<0.05$), that serum NO level was positively correlated with scores for somatization and anxiety ($r=0.247, 0.283$; $P<0.05$), and that serum 5-HT level was negatively correlated with interpersonal sensitivity and anxiety ($r=-0.369, -0.363$; $P<0.05$). After mental and psychological intervention, the levels of serum SP and 5-HT in the observation group increased significantly, the serum NO level decreased significantly, and the average SCL-90 score decreased significantly, and the total SF-36 score increased significantly ($P<0.05$ for all). **Conclusion** The quality of life in the elderly STC patients declined significantly compared with that of the control group without gastrointestinal diseases, and the mental and psychological disorders worsen, featuring decreased secretions of intestinal excitatory transmitters and increased secretion of inhibitory transmitters. There is a correlation between serum neurotransmitters levels and mental and psychological disorders in the elderly STC patients. Adjusting the patient's mental and psychological status can improve the abnormal levels of intestinal neurotransmitters and improve the quality of life of the patient.

【Key words】 aged; slow-transit constipation; intestinal neurotransmitter; psychology; quality of life

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结肠慢传输型便秘 (slow-transit constipation, STC) 是指由结肠传输功能障碍导致肠内容物传输缓慢所引起的便秘,是老年人群中常见的功能性便秘类型,主要临床表现为排便频率降低、大便干结及排便费力等^[1]。目前,结肠 STC 的具体发病机制尚不清楚,依旧处于研究阶段。有研究表明,肠神经系统改变在结肠 STC 发病机制中占据重要地位,其中肠道神经递质表达异常将导致肠道神经调节失衡,促进结肠 STC 的发生^[2]。此外,精神心理因素也被证实与结肠 STC 密切相关。有研究称,结肠 STC 患者普遍存在各种精神心理障碍,同时,精神心理障碍所导致的心理应对机制缺陷也是结肠 STC 的重要病因之一^[3]。随着临床观念的转换,生物-心理-社会医学模型带来了新的健康服务理念,强调应用“生活质量”评估疾病症状对患者所造成的主观感受的影响。因此,本研究对老年结肠 STC 患者肠道神经递质及精神心理状况进行调查,并对患者生活质量进行分析,旨在进一步研究结肠 STC 发病机制,为提高患者生活质量提供参考。

1 对象与方法

1.1 研究对象

将四川大学华西医院广安医院肛肠科 2020 年 12 月至 2022 年 12 月收治的 115 例老年结肠 STC 患者纳为观察组,同期健康体检部接收的 90 名无胃肠

道疾病的同龄老年人作为对照组。观察组纳入标准:年龄 ≥ 60 岁;符合《罗马Ⅲ标准》中结肠 STC 相关诊断标准^[4];有排便次数减少、少便意、粪便坚硬、排便困难等临床症状,肛门直肠指检时直肠内无粪便或触及坚硬粪便,结肠传输时间延长,且缺乏出口梗阻型便秘的证据;钡灌肠或结肠镜检查无结直肠器质性疾病;仅采用保守治疗。对照组纳入标准:年龄、性别比例等资料与观察组相匹配;无胃肠道疾病。共同排除标准:合并恶性肿瘤及重要器官功能障碍等其他严重影响患者生活质量的器质性疾病;合并中重度认知障碍不能配合调查;合并血液系统或自身免疫系统疾病。本研究经四川大学华西医院广安医院医学伦理委员会批准(伦理批号:2020079),受试者均知情且同意。

1.2 方法

1.2.1 一般资料收集 收集受试者年龄、性别、体质指数(body mass index, BMI)及基础性疾病等资料。

1.2.2 血清肠道神经递质水平检测 观察组于采集血液标本 7 d 前停止服用泻剂。采集患者外周空腹静脉血 5 ml,离心机 3 000 转/min 离心 15 min,留取上层血清待用。采用酶联免疫吸附法检测血清 P 物质(substance P, SP)、一氧化氮(nitric oxide, NO)以及 5-羟色氨酸(5-hydroxytryptophan, 5-HT)水平。试剂盒均购自赛默飞世尔科技公司。

1.2.3 90 项症状自评量表^[5] 采用 90 项症状自评量表(symptom check-list 90, SCL-90)评估患者精

神心理状态。量表共有 90 个评估项目,包括 10 个因子,分别为躯体化、强迫症状、人际关系敏感、抑郁、焦虑、敌对、恐怖、偏执、精神病性及其他,得分越高提示精神心理障碍越严重。

1.2.4 简明健康状况调查问卷^[6] 采用简明健康状况调查问卷(short-form-36 health survey, SF-36)调查患者生活质量。问卷包括生理职能(role physical, RP)、生理功能、躯体疼痛、总体健康(general health, GH)、生命力(vitality, VT)、情感职能、社会功能以及精神健康(mental health, MH)8 个维度,各维度得分范围 0~100 分,得分越高提示患者生活质量越好。

1.2.5 精神心理干预 对观察组患者采取统一的精神心理干预方法。在评估患者心理精神状态后,对其进行健康教育,提高患者对便秘的相关认识,包括便秘产生原因、病程、预后、治疗方法及自我调养方法等,向患者阐述精神心理状态对便秘的影响,同时教导患者应用音乐疗法、转移注意力及正向冥想等方法进行自我调节,减轻精神心理压力。对具有焦虑症或抑郁症的患者给予抗焦虑、抑郁用药,对具有睡眠障碍者给予安眠药。以上干预持续 6 个月,期间患者均同时采用保守治疗。在干预完成后重新评估患者血清神经递质水平、SCL-90 及 SF-36 得分。

1.3 统计学方法

采用 SPSS 20.0 统计软件进行数据分析。计量资料以均数±标准差($\bar{x} \pm s$)表示,组间比较采用独立样本 t 检验。计数资料以例数(百分率)表示,组间比较采用 χ^2 检验。采用 Pearson 相关系数分析老年便秘患者血清神经递质水平与精神心理状况的相关性。 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 两组患者一般资料比较

2 组患者年龄、性别、BMI 以及 2 型糖尿病、高血压、高脂血症、冠心病、中风史等基础性疾病比较,

差异均无统计学意义($P > 0.05$;表 1)。

2.2 两组患者血清肠道神经递质水平比较

观察组患者血清 SP 及 5-HT 水平显著低于对照组,NO 水平显著高于对照组,差异均有统计学意义(均 $P < 0.05$;表 2)。

2.3 两组患者精神心理状况比较

观察组患者 SCL-90 中躯体化、人际关系敏感、抑郁和焦虑因子得分以及量表总平均分均显著高于对照组,差异均有统计学意义(均 $P < 0.05$;表 3)。

2.4 两组患者生活质量比较

观察组 SF-36 中 RP、GH、VT 和 MH 维度得分以及问卷总得分均显著低于对照组,差异均有统计学意义(均 $P < 0.05$;表 4)。

2.5 观察组患者血清肠道神经递质因子水平与精神心理状况的相关性分析

Pearson 相关性分析提示,观察组患者血清 SP 与 SCL-90 中躯体化、人际关系敏感以及焦虑因子得分呈负相关,血清 NO 水平与躯体化及焦虑因子得分呈正相关,血清 5-HT 水平与人际关系敏感及焦虑因子呈负相关(均 $P < 0.05$;表 5)。

2.6 干预后观察组的血清神经递质水平、精神心理状况及生活质量

精神心理干预后,观察组患者血清神经递质 SP 及 5-HT 水平上升,血清 NO 水平下降,SCL-90 量表总平均分下降,SF-36 问卷总得分上升,差异均有统计学意义(均 $P < 0.05$;表 6)。

3 讨论

结肠 STC 是临床最常见的便秘类型,老年人群机体免疫力下降,多病共存现象明显,长期便秘引起的腹压升高可能诱导脑卒中及心血管意外事件,威胁患者生命安全^[7]。分析结肠 STC 致病机制,对指导结肠 STC 治疗具有重要意义。

表 1 两组患者一般资料比较

Table 1 Comparison of general data between two groups

Group	n	Age (years, $\bar{x} \pm s$)	Male/female (n)	BMI (kg/m ² $\bar{x} \pm s$)	Basic disease[n(%)]					
					T2DM	Hypertension	Hyperlipidemia	Coronary heart disease	History of stroke	Others
Observation	115	66.45±5.31	60/55	22.66±2.11	30(26.09)	40(34.78)	24(20.87)	20(17.39)	8(6.96)	9(7.83)
Control	90	65.17±4.85	46/44	22.41±2.31	18(20.00)	24(26.67)	15(16.67)	11(12.22)	5(5.56)	5(5.56)
χ^2/t		1.779	0.023	0.806	1.043	1.549	0.579	1.051	0.167	0.409
P value		0.077	0.880	0.421	0.307	0.213	0.447	0.305	0.683	0.522

BMI: body mass index; T2DM: type 2 diabetes mellitus.

表 2 两组患者血清肠道神经递质水平比较

Table 2 Comparison of serum levels of intestinal neurotransmitters between two groups ($\bar{x}\pm s$)

Group	<i>n</i>	SP (ng/L)	NO (μmol/L)	5-HT (μg/L)
Observation	115	53.43±13.25	84.35±19.38	96.36±21.37
Control	90	64.58±15.37	32.06±5.34	177.82±24.36
<i>t</i>		5.572	24.857	25.465
<i>P</i> value		<0.001	<0.001	<0.001

SP: substance P; NO: nitric oxide; 5-HT: 5-hydroxytryptophan.

表 3 两组患者精神心理状况比较

Table 3 Comparison of mental and psychological state between two groups (points, $\bar{x}\pm s$)

Item	Observation group (<i>n</i> =115)	Control group (<i>n</i> =90)	<i>t</i>	<i>P</i> value
Somatization	1.56±0.25	1.23±0.27	9.055	<0.001
Obsessive-compulsive symptom	1.63±0.35	1.55±0.34	1.645	0.102
Interpersonal sensitivity	1.55±0.26	1.28±0.33	6.553	<0.001
Depression	1.63±0.31	1.36±0.25	6.726	<0.001
Anxiety	1.71±0.33	1.34±0.31	8.180	<0.001
Hostility	1.31±0.29	1.33±0.35	0.447	0.655
Terror	1.25±0.26	1.22±0.29	0.779	0.437
Paranoia	1.32±0.38	1.35±0.39	0.555	0.580
Psychosis	1.41±0.31	1.36±0.34	1.098	0.273
Others	1.36±0.29	1.32±0.31	0.951	0.343
Total average score	14.73±2.36	13.34±2.29	4.240	<0.001

表 4 两组患者生活质量比较

Table 4 Comparison of quality of life between two groups (points, $\bar{x}\pm s$)

Item	Observation group (<i>n</i> =115)	Control group (<i>n</i> =90)	<i>t</i>	<i>P</i> value
PF	84.18±13.64	85.01±16.33	0.396	0.692
BP	80.09±15.69	81.43±16.37	0.595	0.552
RP	75.43±15.36	80.39±16.37	2.229	0.027
GH	61.98±12.67	67.46±13.76	2.959	0.004
RE	70.96±13.38	71.04±14.39	0.041	0.967
VT	73.42±12.56	82.69±16.15	4.624	<0.001
MH	66.63±12.37	75.04±13.64	4.617	<0.001
SF	74.26±14.77	75.03±15.09	0.367	0.714
Total score	586.95±58.59	618.09±60.37	3.726	<0.001

PF: physical function; BP: body pain; RP: role physical; GH: general health; RE: role emotional; VT: vitality; MH: mental health; SF: social function.

表 6 干预后观察组血清神经递质水平、精神心理状况及生活质量

Table 5 Serum neurotransmitter levels, mental and psychological state and quality of life in observation group after intervention (*n*=115, $\bar{x}\pm s$)

Time	SP (ng/L)	NO (μmol/L)	5-HT (μg/L)	Total average score of SCL-90 (points)	Total score of SF-36 (points)
Before intervention	53.43±13.25	84.35±19.38	96.36±21.37	14.73±2.36	586.95±58.59
After intervention	61.13±12.69	56.98±20.31	131.79±22.49	13.65±3.42	610.41±60.37
<i>t</i>	-6.366	14.790	-17.325	4.008	-4.230
<i>P</i> value	<0.001	<0.001	<0.001	<0.001	<0.001

SP: substance P; NO: nitric oxide; 5-HT: 5-hydroxytryptophan; SCL-90: symptom check-list 90; SF-36: MOS short-form-36 health survey.

表 5 观察组患者血清肠道神经递质因子水平与精神心理状况的相关性分析

Table 5 Correlation of serum intestinal neurotransmitter factor level with mental and psychological state of patients in observation group

Item	SP (ng/L)	NO (μmol/L)	5-HT (μg/L)
Somatization	-0.243 *	0.247 *	-0.074
Obsessive-compulsive symptom	-0.075	0.134	0.134
Interpersonal sensitivity	-0.276 *	0.133	-0.369 *
Depression	-0.113	0.156	-0.133
Anxiety	-0.311 *	0.283 *	-0.363 *
Hostility	0.079	0.147	0.037
Terror	-0.076	0.085	-0.107
Psychosis	0.116	0.137	-0.119
Others	0.143	0.125	-0.043

SP: substance P; NO: nitric oxide; 5-HT: 5-hydroxytryptophan. **P*<0.05.

本研究从肠道神经递质方面对老年结肠 STC 致病机制进行分析,结果发现,老年结肠 STC 患者血清 SP 及 5-HT 水平低于同龄对照组,NO 水平高于同龄对照组,其中 SP 及 5-HT 是兴奋性递质,NO 是抑制性递质。SP 能刺激结肠蠕动,并直接作用于环形肌与纵行肌,进一步促进结肠收缩与蠕动^[8]。5-HT 具有促进肠壁蠕动功效^[9]。NO 是胃肠道平滑肌松弛相关神经系统中的抑制性神经递质,能削弱结肠蠕动强度^[10]。以上研究结果提示老年结肠 STC 患者肠道神经递质水平异常,具体表现为兴奋性递质分泌减少,抑制性递质分泌增多,与王永彬等^[11]研究结果相似。这可能与老年人受年龄因素影响,本身就存在肠道蠕动减慢、参与排便的肌肉张力降低、内脏感觉减退、对排便反应的敏感性降低等特点,且不少患者长期服用泻药,使用开塞露,均可能导致胃肠道功能减退及盆底肌群功能紊乱,进而造成肠道神经递质分泌异常。此外,老年人基础疾病多,不少患者因合并心肌梗死、肺心病、肺气肿等疾病不能用力排便,进而有意抑制排便,也在一定程度上增加了便秘发生风险及肠道神经递质改变。

结肠 STC 被认为是一种身心疾病,有研究证实,精神心理障碍可能增加结肠 STC 发病风险,同时,结肠 STC 发病后症状将进一步加重患者精神心理负担,进而加重结肠 STC 症状,形成恶性循环^[12,13]。本研究发现,与同龄无胃肠道疾病的对照组相比,老年结肠 STC 患者 SCL-90 中躯体化、人际关系敏感、焦虑及抑郁维度得分明显升高,提示老年结肠 STC 患者以上精神心理维度受损明显。同时,本研究还发现,老年结肠 STC 患者生活质量 SF-36 中 RP、GH、VT、MH 维度以及总得分均明显低于同龄无胃肠道疾病的对照组,说明结肠 STC 可降低患者生活质量,与孟丽敏等^[14]研究结论一致。

有研究称,精神心理障碍可能通过抑制外周自主神经,影响下丘脑及植物神经系统对结肠的作用,加重便秘病情^[15]。本研究发现,老年结肠 STC 患者血清神经递质水平与其精神心理障碍之间也存在一定的关系,具体表现为血清 SP 与 SCL-90 量表中躯体化、人际关系敏感以及焦虑维度得分呈负相关,血清 NO 水平与躯体化及焦虑维度得分呈正相关,血清 5-HT 水平与人际关系敏感及焦虑维度呈负相关,提示神经递质可能与精神心理障碍相互作用,共同参与结肠 STC 致病机制。但受限于研究设计与研究条件,其中的具体作用尚不清楚,可作为下一步研究的方向。

此外,本研究对观察组患者进行精神心理干预后发现,观察组患者的血清神经递质 SP 及 5-HT 水平上升,血清 NO 水平下降,精神心理状况 SCL-90 量表总平均分下降,生活质量 SF-36 总得分上升,提示在改善老年结肠 STC 患者精神心理状态后,其血清肠道神经兴奋递质异常状态及生活质量均有所改善,调节老年结肠 STC 患者的精神心理状态对其病情有利。

综上,老年结肠 STC 患者生活质量与同龄无胃肠道疾病的对照组相比明显下降,精神心理障碍更严重,且存在肠道兴奋性递质分泌减少、抑制性递质分泌增多表现。相关性分析提示,老年结肠 STC 患者肠道神经递质水平与其精神心理障碍之间具有相关性,调节患者精神心理状态可在一定程度上改善其肠道神经递质水平异常,提高患者生活质量。

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