·临床研究·

血压与2型糖尿病患者视网膜神经纤维层厚度的相关性

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【摘 要】 目的 探讨血压与2型糖尿病(T2DM)视网膜神经纤维层(RNFL)厚度的相关性。**方法** 选取2017年1月至2018年12月就诊于哈尔滨医科大学附属第一医院内分泌科的123例T2DM患者,根据荧光素眼底血管造影结果,按糖尿病性视网膜病变新的国际临床分级标准(2002年),将患者分为无糖尿病视网膜病变(NDR)组65例和非增殖期糖尿病视网膜病变(NPDR)组58例。收集入组患者的一般资料,记录糖化血红蛋白A1c(HbA1c)、空腹C肽等相关血化验结果。测量收缩压(SBP)、舒张压(DBP),计算平均动脉压(MAP)。光学相干断层成像(OCT)测量RNFL厚度。采用SPSS 22.0软件进行统计学分析,Spearman秩相关分析各象限RNFL厚度与血压之间的相关关系,采用单因素和多因素线性回归分析各象限RNFL厚度的独立影响因素。**结果** 与NDR组相比,NPDR组SBP、MAP显著增高,差异有统计学意义($P<0.05$)。相关分析显示,年龄与视网膜颞上($r=-0.184$,$P=0.041$)、颞下($r=-0.224$,$P=0.013$)象限RNFL厚度均显著负相关;体质量指数(BMI)与视网膜鼻下($r=-0.256$,$P=0.004$)象限RNFL厚度显著负相关;SBP与视网膜鼻上($r=-0.203$,$P=0.024$)、颞下($r=-0.272$,$P=0.002$)、颞侧($r=-0.286$,$P=0.001$)象限RNFL厚度均显著负相关;MAP与视网膜鼻上($r=-0.185$,$P=0.041$)、颞下($r=-0.264$,$P=0.003$)、颞侧($r=-0.253$,$P=0.005$)象限RNFL厚度均显著负相关;HbA1c与视网膜颞上($r=-0.234$,$P=0.009$)、颞下($r=-0.201$,$P=0.025$)象限RNFL厚度均显著负相关,差异均有统计学意义($P<0.05$)。单因素及多因素线性回归分析结果显示,SBP是视网膜鼻上、颞下、颞侧象限RNFL厚度的独立影响因素。**结论** 血压升高加速视网膜神经退行性改变,提示尽早关注血压变化可能有利于避免早期视网膜神经退变。

【关键词】 血压;糖尿病,2型;视网膜神经纤维层
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Correlation between blood pressure and thickness of retinal nerve fiber layer in type 2 diabetes mellitus

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【Abstract】 Objective To investigate the correlation between blood pressure and thickness of retinal nerve fiber layer (RNFL) in type 2 diabetes mellitus (T2DM). **Methods** A total of 123 patients with T2DM were selected for the study, who visited the Endocrinology Department of the First Hospital Affiliated to Harbin Medical University between January 2017 and December 2018. Based on the fluorescein fundus angiographic findings, the patients were divided into a group without diabetic retinopathy (NDR group, $n=65$) and a group with non-proliferative diabetic retinopathy (NPDR group, $n=58$) according to the International Clinical Grading Scale for Diabetic Retinopathy (2002). The general clinical data of the enrolled patients were collected, and the results of the blood tests, such as glycated hemoglobin A1c (HbA1c) and fasting C-peptide, were recorded. Systolic blood pressure (SBP), diastolic blood pressure (DBP) were measured, and mean arterial pressure (MAP) was calculated. RNFL thickness was measured with optical coherence tomography (OCT). SPSS statistics 22.0 was used for statistical analysis. The correlation between RNFL thickness and blood pressure in each quadrant was analyzed by Spearman rank correlation. Univariate and multivariate linear regression were performed to analyze the independent factors of RNFL thickness in each quadrant. **Results** SBP and MAP were significantly higher in the NPDR group than those in the NDR group ($P<0.05$). Correlation analysis revealed significantly negative correlation between age and RNFL thickness in both the supratemporal ($r=-0.184$, $P=0.041$) and infratemporal ($r=-0.224$, $P=0.013$) quadrants, between the body mass index (BMI) and the lower nasal retina ($r=-0.256$, $P=0.004$), between SBP and RNFL thickness in the upper nasal ($r=-0.203$,

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$P=0.024$), infratemporal ($r=-0.272$, $P=0.002$) and temporal ($r=-0.286$, $P=0.001$) quadrants, between MAP and RNFL thickness of the upper nasal ($r=-0.185$, $P=0.041$), infratemporal ($r=-0.264$, $P=0.003$) and temporal ($r=-0.253$, $P=0.005$) quadrants, and between HbA1c and RNFL thickness of the supratemporal ($r=-0.234$, $P=0.009$) and infratemporal ($r=-0.201$, $P=0.025$) quadrants, the difference being statistically significant for all ($P<0.05$). The univariate and multivariate linear regression analysis showed SBP as an independent factor of RNFL thickness in the upper nasal, infratemporal, and temporal quadrants. **Conclusion** Elevated blood pressure accelerates degenerative change in the retina, suggesting early attention to changes in blood pressure may help to avoid early nervous degeneration of the retina.

【Key words】 blood pressure; diabetes mellitus, type 2; retinal nerve fiber layer

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糖尿病视网膜病变(diabetic retinopathy, DR)是2型糖尿病(type 2 diabetes mellitus, T2DM)常见慢性微血管并发症之一,严重者可导致失明。最新研究表明T2DM在出现临床可见的视网膜微血管改变前已出现视网膜神经退行性改变[1-3]。有报道证实,视网膜神经退行性改变涉及神经元凋亡、节细胞体丢失和胶质细胞反应性缺陷。在神经元改变中,视网膜神经纤维层(retinal nerve fiber layer, RNFL)变薄是视网膜神经退行性病变的早期表现[4],可通过光学相干断层成像(optical coherence tomography, OCT)对RNFL厚度进行精确测量,观察其变化[5]。随着生活方式的改变,高血压成为糖尿病患者的常见合并症,同时也是心、脑、肾等器官病变的已知高危因素,其对视网膜血管病变有一定的促进作用[6]。本研究通过分析T2DM患者血压与RNFL的相关性,为探讨血压对DR的影响提供依据。

1 对象与方法

1.1 研究对象

回顾性分析2017年1月至2018年12月就诊于哈尔滨医科大学附属第一医院内分泌科的123例T2DM患者,中位年龄53(46,59)岁,中位糖尿病病程8(3,13)年。根据荧光素眼底血管造影(fundus fluorescein angiography, FFA)结果,按糖尿病性视网膜病变新的国际临床分级标准(2002年)[7],将患者分为无糖尿病视网膜病变(non-diabetic retinopathy, NDR)组65例和非增殖期糖尿病视网膜病变(non-proliferative diabetic retinopathy, NPDR)组58例。纳入标准:(1)符合WHO 1999年制订的《糖尿病诊断标准》[8];(2)根据最新的ESC/ESH动脉高血压管理指南,入组患者最多1级高血压,血压<160/100mmHg(1 mmHg=0.133 kPa)[9];(3)无高眼压病史,眼压范围11~21 mmHg;(4)无特殊眼部病史。排除标准:(1)增殖期糖尿病视网膜病变;(2)1型及特殊类型糖尿病;(3)阿尔茨海默症等神经系统疾病,全身系统性疾病及高血压导致的视网膜病变。本回顾性研究遵循《赫尔辛基宣言》,获得哈尔滨医科大学附属第一医院伦理委员会批准,免除患者签署知情同意书。

1.2 方法

1.2.1 收集患者基线资料 收集入组患者的一般资料,包括年龄、性别、病程、体质量指数(body mass index, BMI)等。所有患者均进行眼压、FFA检查。

1.2.2 血生化检查 收集研究对象空腹血糖(fasting plasma glucose, FPG)、糖化血红蛋白A1c(glycosylated hemoglobin A1c, HbA1c)、总胆固醇(total cholesterol, TC)、甘油三酯(triglycerides, TG)、血肌酐(serum creatinine, SCr)、尿素氮(blood urea nitrogen, BUN)等检验结果。

1.2.3 血压检查 选取温度适宜、环境安静的房间。嘱患者静坐休息5~10 min后使用台式水银血压计测量两次血压,两次测量间隔5 min。记录收缩压(systolic blood pressure, SBP)、舒张压(diastolic blood pressure, DBP),取两次测量平均值作为血压结果用于分析。计算平均动脉压(mean arterial pressure, MAP),MAP=(SBP+2×DBP)/3。

1.2.4 OCT测定RNFL厚度 应用德国海德堡OCT仪(870 nm波长,40000 Hz/s)进行检查,以视盘中点为中心,进行直径为3.45 mm的圆盘区域扫描,行3次重复性较好的优化扫描。利用计算机图像分析系统进行RNFL厚度的测量,测量参数包括:鼻上(superonasal, NS)、鼻下(inferonasal, NI)、鼻侧(nasal, N)、颞上(supratemporal, TS)、颞下(infratemporal, TI)、颞侧(temporal, T)RNFL厚度。同一操作者选用同一设备,同一患者双眼病变程度相同者随机选一只眼的OCT数据,病变程度不同者选取病变严重的眼OCT数据入组。每眼至少扫描3次,取信号最好、重复率最高的数值进行保存分析。

1.3 统计学处理

采用 SPSS 22.0 软件进行统计学分析。计量资料呈正态分布者以均数±标准差($\bar{x}\pm s$)表示,组间比较采用独立样本 t 检验;呈非正态分布者以中位数(四分位间距)[$M(Q_1, Q_3)$]表示,组间比较采用秩和检验。计数资料以例数(百分率)表示,组间比较采用 χ^2 检验。Spearman 秩相关分析各象限 RNFL 厚度与血压之间的相关关系。采用单因素和多因素线性回归分析各象限 RNFL 厚度的独立影响因素。$P<0.05$ 为差异有统计学意义。

2 结 果

2.1 2 组患者基线资料比较

与 NDR 组相比,NPDR 组年龄、病程、BMI、SBP、MAP 和尿素氮明显增高,RNFL 厚度在 NI、TI 象限明显变薄,差异均有统计学意义($P<0.05$;表 1)。

2.2 各象限 RNFL 厚度与相关指标的相关性分析

年龄与视网膜 TS($r=-0.184$, $P=0.041$)、TI($r=-0.224$, $P=0.013$)象限 RNFL 厚度均显著负相关;BMI 与视网膜 NI($r=-0.256$, $P=0.004$)象限 RNFL 厚度显著负相关;SBP 与视网膜 NS($r=-0.203$, $P=0.024$)、TI($r=-0.272$, $P=0.002$)、T($r=-0.286$, $P=0.001$)象限 RNFL 厚度均显著负相关;MAP 与视网膜 NS($r=-0.185$, $P=0.041$)、TI($r=-0.264$, $P=0.003$)、T($r=-0.253$, $P=0.005$)象限 RNFL 厚度均显著负相关;HbA1c 与视网膜 TS($r=-0.234$, $P=0.009$)、TI($r=-0.201$, $P=0.025$)象限 RNFL 厚度均显著负相关。详见表 2。

2.3 单因素线性回归分析结果

以 T2DM 患者各象限 RNFL 为因变量,进行单因素线性回归分析,结果显示,年龄、BMI、SBP、MAP、HbA1c 与 T2DM 患者 RNFL 厚度相关($P<0.05$;表 3)。

2.4 多因素线性回归分析结果

在上述单因素线性回归分析基础上,以 T2DM 患者各象限 RNFL 为因变量,以年龄、BMI、HbA1c、SBP 为自变量,行多因素线性回归分析,结果显示 SBP 是视网膜 NS、TI、T 象限 RNFL 厚度的独立影响因素($P<0.05$;表 4)。

表 1 2 组患者基本资料比较

Table1 Comparison of baseline data between two groups

Item	NDR group ($n=65$)	NPDR group ($n=58$)	P value
Age[years, $M(Q_1, Q_3)$]	49(44, 55)	57(51, 61)	<0.001*
DM duration[years, $M(Q_1, Q_3)$]	5.00(1.25, 11.00)	9.00(4.75, 15.00)	0.013*
Hypertension history[n(%)]	17(26.15)	22(37.93)	0.179
BMI[(kg/m^2, $M(Q_1, Q_3)$],	25.00(22.72, 27.26)	26.10(24.67, 27.82)	0.015*
SBP[mmHg, $M(Q_1, Q_3)$]	126(118, 132)	133(125, 150)	<0.001*
DBP(mmHg, $\bar{x}\pm s$)	78.52±8.44	80.05±9.16	0.340
MAP[mmHg, $M(Q_1, Q_3)$]	93(88, 100)	99(93, 104)	0.006*
ESR(mm/h, $\bar{x}\pm s$)	8.09±5.88	6.32±5.65	0.102
HbA1c(%, $\bar{x}\pm s$)	8.76±2.16	8.75±1.99	0.970
FPG(mmol/L, $\bar{x}\pm s$)	9.62±3.21	9.60±3.90	0.966
TC(mmol/L, $\bar{x}\pm s$)	5.07±1.18	5.70±3.52	0.195
TG(mmol/L, $\bar{x}\pm s$)	2.39±1.80	2.80±1.96	0.227
SCr(mmol/L,$\bar{x}\pm s$)	62.82±20.87	61.73±15.70	0.741
BUN[mmol/L, $M(Q_1, Q_3)$]	5.36(4.28, 6.40)	6.10(5.10, 6.89)	0.015*
IOP(mmHg, $\bar{x}\pm s$)	18.0±1.9	18.1±2.0	0.812
NS(μm, $\bar{x}\pm s$)	119.3±21.6	116.3±21.8	0.450
NI[μm, $M(Q_1, Q_3)$]	119.0(104.0, 139.1)	106.5(95.3, 124.3)	0.005*
N(μm, $\bar{x}\pm s$)	70.1±13.4	70.3±13.4	0.935
TS(μm, $\bar{x}\pm s$)	142.3±17.2	138.1±21.7	0.244
TI(μm, $\bar{x}\pm s$)	150.9±22.6	142.4±24.2	0.046*
T(μm, $\bar{x}\pm s$)	78.7±12.1	77.2±11.1	0.470

NDR: non-diabetic retinopathy; NPDR: non-proliferative diabetic retinopathy; DM: diabetes mellitus; BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; MAP: mean arterial pressure; ESR: blood sedimentation; HbA1c: glycosylated hemoglobin A1c; FPG: fasting plasma glucose; TC: total cholesterol; TG: triglycerides; SCr: serum creatinine; BUN: blood urea nitrogen; IOP: intraocular pressure; NS: superonasal; NI: inferonasal; N: nasal; TS: supratemporal; TI: infratemporal; T: temporal. *$P<0.05$. 1 mmHg=0.133 kPa.

表2 各象限 RNFL 厚度与相关指标的相关性分析

Table 2 Correlation analysis between RNFL thickness and relevant indicators in each quadrant

Item	NS		NI		N		TS		TI		T	
	r	*P* value	*r*	*P* value	*r*	*P* value	*r*	*P* value	*r*	*P* value	*r*	*P* value
Age	−0.001	0.993	0.044	0.629	0.145	0.110	−0.184	0.041*	−0.224	0.013*	−0.162	0.073
DM duration	−0.029	0.748	0.020	0.824	0.167	0.066	−0.026	0.775	−0.139	0.124	−0.005	0.952
Hypertension history	0.125	0.167	0.074	0.416	0.063	0.490	0.154	0.089	0.166	0.066	0.124	0.172
BMI	−0.090	0.324	−0.256	0.004*	−0.035	0.697	−0.085	0.351	−0.045	0.039*	−0.039	0.670
SBP	−0.203	0.024*	−0.080	0.381	−0.084	0.357	−0.114	0.210	−0.272	0.002*	−0.286	0.001*
DBP	−0.089	0.329	−0.100	0.271	−0.121	0.181	−0.075	0.407	−0.185	0.041*	−0.163	0.072
MAP	−0.185	0.041*	−0.121	0.184	−0.122	0.178	−0.162	0.074	−0.264	0.003*	−0.253	0.005*
HbA1c	−0.023	0.800	−0.117	0.198	−0.090	0.323	−0.234	0.009*	−0.201	0.025*	−0.113	0.215
ESR	0.012	0.896	0.122	0.195	−0.038	0.684	0.090	0.340	0.162	0.084	0.121	0.196
FPG	−0.037	0.683	−0.123	0.070	−0.129	0.156	−0.006	0.944	−0.122	0.178	−0.122	0.218
TC	0.077	0.398	0.049	0.588	0.216	0.123	−0.084	0.357	−0.082	0.368	−0.207	0.022*
TG	0.034	0.710	−0.177	0.050	−0.076	0.400	0.055	0.549	0.013	0.883	−0.052	0.569
SCr	−0.025	0.782	−0.207	0.022*	−0.035	0.702	−0.050	0.583	−0.022	0.812	−0.011	0.904
BUN	−0.054	0.552	−0.168	0.063	−0.068	0.453	−0.078	0.393	−0.084	0.358	−0.063	0.486
IOP	−0.014	0.874	−0.026	0.778	−0.074	0.413	0.028	0.754	−0.116	0.202	−0.128	0.159

RNFL: retinal nerve fiber layer; NS: superonasal; NI: inferonasal; N: nasal; TS: supratemporal; TI: infratemporal; T: temporal; DM: diabetes mellitus; BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; MAP: mean arterial pressure; HbA1c: glycosylated hemoglobin A1c; ESR: blood sedimentation; FPG: fasting plasma glucose; TC: total cholesterol; TG: triglycerides; SCr: serum creatinine; BUN: blood urea nitrogen; IOP: intraocular pressure. *$P<0.05$.

表3 T2DM 各象限 RNFL 厚度单因素线性回归分析

Table 3 Univariate linear regression analysis of RNFL thickness in each quadrant of patients with T2DM

Item	NS			NI			N			TS			TI			T		
	B	*t*	*P* value	*B*	*t*	*P* value	*B*	*t*	*P* value	*B*	*t*	*P* value	*B*	*t*	*P* value	*B*	*t*	*P* value
Age	−0.001	−0.009	0.993	0.044	0.484	0.629	0.145	1.611	0.110	−0.184	−2.061	0.041*	−0.224	−2.524	0.013*	−0.162	−1.806	0.073
DM duration	−0.017	−0.186	0.853	0.051	0.565	0.573	0.186	2.087	0.059	−0.042	−0.465	0.643	0.111	1.224	0.223	−0.043	−0.473	0.637
Hypertension history	0.109	1.206	0.230	0.052	0.570	0.570	0.086	0.955	0.342	0.155	1.728	0.086	0.218	2.460	0.055	0.135	1.501	0.536
BMI	−0.119	−1.323	0.188	−0.216	−2.428	0.017*	−0.075	−0.826	0.410	−0.136	−1.512	0.133	−0.016	−0.180	0.858	−0.079	−0.877	0.382
SBP	−0.195	−2.189	0.031*	−0.056	−0.612	0.542	−0.058	−0.638	0.525	−0.144	−1.600	0.112	−0.272	−3.111	0.002*	−0.287	−3.179	0.002*
DBP	−0.126	−1.395	0.166	−0.139	−1.539	0.126	−0.139	−1.545	0.125	−0.131	−1.457	0.148	−0.185	−2.068	0.041*	−0.164	−1.825	0.070
MAP	−0.185	−2.069	0.041*	−0.121	−1.337	0.184	−0.122	−1.354	0.178	−0.162	−1.805	0.074	−0.264	−3.010	0.003*	−0.253	−2.875	0.005*
HbA1c	0.016	0.177	0.860	−0.038	−0.418	0.677	−0.039	−0.426	0.671	−0.234	−2.651	0.009*	−0.147	−1.639	0.104	−0.110	−1.220	0.225
ESR	0.037	0.390	0.697	0.102	1.088	0.279	−0.009	−0.092	0.927	0.074	0.784	0.435	0.178	1.920	0.057	0.166	1.791	0.076
FPG	−0.013	−0.145	0.885	−0.113	−1.252	0.213	−0.107	−1.185	0.238	0.028	0.303	0.762	−0.147	−1.640	0.104	−0.135	−1.494	0.138
TC	0.039	0.426	0.671	0.017	0.192	0.848	0.050	0.549	0.584	−0.025	−0.270	0.787	−0.016	−0.179	0.858	−0.124	−1.379	0.170
TG	−0.040	−0.445	0.657	−0.062	−0.678	0.499	−0.077	−0.853	0.395	−0.035	−0.383	0.702	−0.108	−1.192	0.236	−0.108	−1.199	0.233
SCr	0.106	1.171	0.244	−0.138	−1.531	0.128	−0.060	−0.665	0.507	−0.128	−1.420	0.158	−0.050	−0.550	0.583	−0.035	−0.382	0.703
BUN	−0.054	−0.597	0.552	−0.168	−1.876	0.063	−0.068	−0.752	0.453	−0.078	−0.857	0.393	−0.084	−0.922	0.358	−0.063	−0.699	0.486
IOP	−0.009	−0.099	0.921	−0.007	−0.076	0.940	−0.095	−1.050	0.296	−0.016	−0.174	0.862	−0.129	−1.428	0.156	−0.138	−1.530	0.129

T2DM : type 2 diabetes mellitus; RNFL: retinal nerve fiber layer; NS: superonasal; NI: inferonasal; N: nasal; TS: supratemporal; TI: infratemporal; T: temporal; DM: diabetes mellitus; BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; MAP: mean arterial pressure; HbA1c: glycosylated hemoglobin A1c; ESR: blood sedimentation; FPG: fasting plasma glucose; TC: total cholesterol; TG: triglycerides; SCr: serum creatinine; BUN: blood urea nitrogen; IOP: intraocular pressure. *$P<0.05$.

表 4 T2DM 患者各象限 RNFL 厚度多因素线性回归分析

Table 4 Multivariate linear regression analysis of RNFL thickness in each quadrant of patients with T2DM

Variable	*B*	*SE*	*t*	*B′*	*P* value
NS					
SBP	−0.307	0.140	−2.189	−0.195	0.031
NI					
BMI	−1.506	0.620	−2.428	−0.216	0.017
TS					
HbA1c	−2.155	0.810	−2.659	−0.232	0.009
Age	−0.400	0.188	−2.124	−0.185	0.036
TI					
SBP	−0.466	0.150	−3.111	−0.272	0.002
T					
SBP	−0.234	0.074	−3.179	−0.278	0.002

T2DM: type 2 diabetes mellitus; RNFL: retinal nerve fiber layer; NS: superonasal; SBP: systolic blood pressure; NI: inferonasal; BMI: body mass index; TS: supratemporal; HbA1c: glycosylated hemoglobin A1c; TI: infratemporal; T: temporal.

3 讨 论

既往临床研究证实了高血压是大血管和微血管功能障碍的重要决定因素[10,11]。轻度升高的血压也会导致脑血管损伤,引起神经退行性改变[12]。RNFL 作为视网膜神经退化的早期指标,临床上常用 OCT 技术对其进行精确测量,OCT 具有轴向高分辨率、可量化测量、可重复性强及安全性好的特点。目前关于中国糖尿病人群血压和 RNFL 相关性的研究较少,本研究探讨了血压与 T2DM 患者 RNFL 厚度之间的相关关系。

有研究证实血压升高会导致 RNFL 厚度显著降低[13],一项关于恒河猴的动物实验表明,慢性高血压会导致 RNFL 的萎缩[14]。既往以高血压人群为研究对象的横断面研究发现,SBP、DBP 及 MAP 的增高会导致 RNFL 厚度变薄[15]。本研究以 T2DM 患者为研究对象,相关性结果显示,SBP、DBP 和 MAP 与 RNFL 厚度呈显著负相关。对结果进一步进行单因素及多因素线性回归分析,在调整年龄、BMI、HbA1c 混杂因素后,显示 SBP 仍然是 RNFL 厚度变薄的独立危险因素。可能原因是在视网膜内存在重要的血流调节机制[16,17],有助于在灌注压力变化期间使血流保持相对恒定。灌注压 = MAP − 眼压(intraocular pressure, IOP)[16]。灌注压主要受血压影响,血压升高时,灌注压会明显升高,当灌注压高于血流调节机制的正常调节范围上限时,会使视网膜血流调节机制异常,导致视网膜神经组织局部缺血。另一项临床调查结果显示,高血压患者的视网膜小动脉口径与 SBP 和 DBP 水平呈负相关[18],随着血压升高,视网膜小动脉口径变小,血管内血流阻力增加,从而影响视网膜血流灌注,扰乱视网膜血流调节功能[19],最终导致 RNFL 变薄[20,21]。这两项临床研究从不同角度得到了相同的结论,均证实了血压通过不同的方式影响了 RNFL 厚度。但目前血压升高导致 RNFL 变薄的具体机制尚未明确,有待进一步研究。

综上所述,对于 T2DM 患者,1 级高血压也会加速视网膜神经退行性改变,临床上对 T2DM 患者的血压管理应更为严格。本研究存在一定的局限性:(1)样本量小且缺少健康对照组,实验结果可能存在抽样误差,有待进一步大样本多中心研究加以证实;(2)因是回顾性研究,缺少 24 小时动态血压监测结果数据。

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·消 息·

《中华老年多器官疾病杂志》“临床病理讨论”栏目征稿

临床病理讨论(Clinicopathological Conference, CPC)是临床实践中的一个重要环节,是多个学科合作对患者进行个体化诊治的一种形式,尤其对于一些疑难和罕见病例更为重要。综合患者的临床表现、实验室检查、影像学检查和病理检查等各项结果,一方面可以明确疾病的诊断并制定治疗方案,使患者受益,另一方面亦有利于为临床医师提供更好的经验和更开阔的思路,提高医师的诊疗能力。一篇好的临床病理讨论,往往是教科书上找不到的活教材,也是其他文体难以取代的好形式。

“临床病理讨论”一直以来都是本刊的一个特色栏目,深受广大读者喜爱。所刊登的一般多为回顾性的病例讨论与总结,旨在总结经验、吸纳教训和传播知识。在工作实践中,我们根据广大读者和作者的建议,对临床病理讨论文章的格式进行了调整。(1)作者在文题下署名(而非仅在文末注明由何人整理),**作者拥有本文的著作权**。(2)文章正文为中文,正文前有言简意赅的中英文摘要。**论文性质等同于本刊“论著”**。(3)所选病例可以是疑难、罕见病例,也可以是诊断明确、但病情危重或有诸多并发症、治疗上甚为棘手的病例,亦可为其他对临床实践有指导或提示意义的病例。

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