

• 临床研究 •

合并阻塞性睡眠呼吸暂停的高血压患者血压变异性 和靶器官损害的研究

李莉 倪如旻

【摘要】 目的 阻塞性睡眠呼吸暂停(OSA)引发睡眠期间血流动力学变化,增加夜间血压变异性,加重靶器官损害,但这种影响可能受年龄的干扰。方法 143例多导睡眠诊断的OSA患者分为3组:<60岁高血压组(62例)、<60岁正常血压组(38例)和>60岁正常血压组(43例),全部进行24h动态血压监测,分析白天和夜间血压变化的标准差(SD)和变异系数(CV),在排除年龄干扰因素外,判断OSA对血压变异性的影响及靶器官的损害情况。结果 与<60岁正常血压组相比,高血压组白天和夜间血压变化SD明显增加,白天收缩压18.5和10.6mmHg ($P<0.05$);白天舒张压13.8和10.6mmHg ($P<0.05$);夜间收缩压20.5和12.6mmHg ($P<0.01$);夜间舒张压17.8和12.6mmHg ($P<0.01$)。血压CV也明显增加,白天收缩压0.119和0.078 ($P<0.01$);白天舒张压0.139和0.118 ($P<0.05$);夜间收缩压0.137和0.111 ($P<0.01$);夜间舒张压0.195和0.177 ($P<0.01$)。与>60岁正常血压组相比,高血压组白天和夜间血压变化SD明显增加,白天收缩压18.5和13.3mmHg ($P<0.05$);白天舒张压13.8和10.2mmHg ($P<0.05$);夜间收缩压20.5和15.2mmHg ($P<0.01$);夜间舒张压17.8和14.2mmHg ($P<0.01$)。白天收缩压CV增加(0.119和0.093; $P<0.05$);夜间收缩压和舒张压CV增加(0.137和0.123; $P<0.01$; 0.195和0.179; $P<0.05$)。与<60岁正常血压组相比,>60岁正常血压组白天收缩压CV增加(0.093和0.078; $P<0.05$)。与<60或>60岁正常血压组相比,高血压组靶器官损害增加($P<0.01$)。与<60岁正常血压组相比,>60岁正常血压组靶器官损害也增加($P<0.05$)。结论 尽管年龄可能影响血压变异性,但是OSA对血压变异性的影响明显超过年龄的作用,并加重靶器官损害。因此,对于合并OSA的老年高血压患者更应给予足够重视。

【关键词】 睡眠呼吸暂停,阻塞性;高血压

Sleep-apnea related blood-pressure variability and target organ damage in hypertensives

LI Li NI Ruyang

Beijing Tongren Hospital, Capital University of Medical Sciences, Beijing 100730, China

【Abstract】 Objective Obstructive sleep apnea (OSA) induces marked hemodynamic fluctuations that might be deleterious to the cardiovascular system. The influence of OSA and aging on short-term blood pressure (BP) variability in OSA patients was investigated. The standard deviation (SD) and coefficient of variation (CV) of BP during daytime and nighttime were assessed to estimate short-term BP variability. Methods Totally 143 subjects with newly-diagnosed untreated OSA were categorized into three groups: subjects aged <60 years with untreated hypertension ($n=62$); normotensive subjects aged <60 years ($n=38$); and normotension subjects aged >60 years ($n=43$). Twenty-four-hour BP was recorded after polysomnography. Results The SD of systolic or diastolic BP during daytime and nighttime was significantly greater in hypertensives than in normotensives aged <60 years (18.5 vs 10.6mmHg, $P<0.05$, and 13.8 vs 10.6mmHg, $P<0.05$, daytime; 20.5 vs 12.6mmHg, $P<0.01$ and 17.8 vs 12.6mmHg, $P<0.01$, nighttime), as was the CV of systolic or diastolic BP during daytime and nighttime (0.119 vs 0.078, $P<0.01$ and 0.139 vs 0.118, $P<0.05$, daytime; 0.137 vs 0.111, $P<0.01$ and 0.195 vs 0.177, $P<0.01$, nighttime); compared to the group of normotensive aged >60 years, the SD of systolic or diastolic BP variations during daytime and nighttime were higher in hypertensives (18.5 vs 13.3mmHg, $P<0.05$ and 13.8 vs 10.2mmHg, $P<0.05$, daytime; 20.5 vs 15.2mmHg, $P<0.01$ and 17.8 vs 14.2mmHg, $P<0.01$, nighttime), and as was the CV of systolic BP during

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作者单位:100730 北京市,首都医科大学附属北京同仁医院 心血管诊疗中心。E-mail:ellen1000@sina.com

daytime (0.119 vs 0.093, $P < 0.05$) and systolic or diastolic BP during nighttime (0.137 vs 0.123, $P < 0.01$ and 0.195 vs 0.179, $P < 0.01$). Daytime systolic BP CV was increased in normotensive elderly patients than in patients aged < 60 years (0.093 vs 0.078, $P < 0.05$). As to the target organ damage, hypertensive group had higher rate than the two normotensive groups ($P < 0.05$), and the elderly group had more target organ damage than the patients aged < 60 years ($P < 0.05$). Conclusion Systemic hypertension is associated with a more severe exacerbation of short-term variability and higher rate of target organ damage in the OSA patients.

【Key words】 sleep apnea, obstructive; hypertension

流行病学调查显示,阻塞性睡眠呼吸暂停(obstructive sleep apnea, OSA)是高血压的独立危险因素之一^[1~3],50% OSA患者合并有高血压,但OSA对心血管系统的损害不仅限于血压本身,还可能与血压变异性有关。为了排除年龄的影响,本研究按照年龄和血压值进行分组,探讨合并OSA的高血压患者夜间血压变异性及靶器官损害情况。

1 资料与方法

1.1 研究方案 2004年3月到2008年11月笔者所在医院睡眠中心经多导睡眠检查(polysomnography, PSG)确诊的143例OSA患者,进行24h动态血压监测,根据年龄和血压情况分为 < 60 岁血压正常组、 < 60 岁高血压组和 > 60 岁血压正常组,比较三组夜间血压变异性及靶器官损害情况。

1.1.1 入选标准 新诊断的OSA患者,呼吸紊乱指数 > 20 次/h;没有高血压以外的心血管疾病治疗史或停止治疗3个月以上;没有糖尿病。

1.1.2 高血压诊断标准 采用1999年世界卫生组织/高血压专家委员会(WHO/ISH)制订的高血压诊断标准。即3次检查核实后,收缩压 ≥ 140 mmHg和舒张压 ≥ 90 mmHg。

1.2 监测 24h动态血压监测:Space Lab 90207型血压计监测仪(美国),排除收缩压 > 260 mmHg或 < 70 mmHg以及舒张压 > 150 mmHg或 < 40 mmHg的读数,昼夜血压的划分时间为6:00和22:00时。动态血压变异性用24h动态血压变化的标准差(standard deviation, SD)和变异系数(coefficient of variation, CV)表示,血压CV为SD/均值。

1.3 资料分析 呼吸分析:呼吸紊乱指数(apnea/hypopnea index, AHI) = (呼吸暂停次数 + 低通气次数)/60(min)。睡眠分析:依据脑电图(A2-C3、A1-C4)的记录,按照Rechtschaffen和Kales的标准分析确定^[5]。计算患者觉醒期占整个记录时间的百分比即睡眠效率,对于睡眠效率 $< 50\%$ 的患者,重

复检查。

1.4 统计分析 应用SPSS软件分析数据,计量资料表示为 $\bar{x} \pm s$,采用 t 检验;计数资料采用 χ^2 检验, $P < 0.05$ 为差异有统计学意义。

2 结果

三组OSA患者一般情况中性别组成和体重指数没有差别。与其他两组相比,高血压组诊室收缩压和舒张压明显较高(表1)。在睡眠参数中,呼吸紊乱指数、微觉醒指数、睡眠结构、血氧饱和度 $< 90\%$ 的时间和睡眠期间的平均血氧饱和度上没有显示出差别(表2)。有4个样本(< 60 岁高血压组2例,其他两组各1例)在呼吸暂停末显示出明显的低氧血症(血氧饱和度 $< 60\%$),而每位患者夜间平均血氧饱和度 $< 90\%$ 。24h血压资料见表3,与 < 60 岁正常血压组相比,高血压组无论是白天还是夜间血压SD和CV明显增大;而与 > 60 岁正常血压组相比,高血压组白天或夜间血压SD增大,白天收缩压和夜间收缩/舒张压CV增大;与 < 60 岁正常血压组相比, > 60 岁正常血压组白天收缩压CV增大。与 < 60 岁或 > 60 岁正常血压组相比,高血压组靶器官损害增加(左室肥厚、蛋白尿、眼底动脉硬化或出血、腔隙性脑梗死),与 < 60 岁正常血压组相比, > 60 岁正常血压组靶器官损害也增加(蛋白尿、眼底动脉硬化或出血、腔隙性脑梗死),见表4。

3 讨论

本研究显示,伴有OSA的高血压患者血压变异性增大,靶器官损害最严重,这种影响远远超过年龄的作用。

研究显示,血压增高的同时血压变异性越大^[5],靶器官损害越大^[6],这主要与高血压患者动脉压力反射敏感性降低以及小动脉血管重塑所致的血管收缩反应性增强有关^[7]。但是年龄本身可以增加血压变异性^[4],增加动脉硬化。本研究虽没有检测动脉

表 1 一般情况比较

组别	年龄(岁)	人数(男/女)	体重指数(kg/m ²)	白天诊室血压(mmHg)	
				收缩压	舒张压
<60 岁正常血压组	47.3	35/3	27.2	126±4.3	78±2.7
<60 岁高血压组	48.3	58/4	28.7	156±3.8* [△]	101±4.1* [*]
>60 岁正常血压组	66.4	37/6	26.9	133±2.3	82±4.6

注:与<60 岁正常血压组相比,**P*<0.05;与>60 岁正常血压组相比,[△]*P*<0.05,**P*<0.01

表 2 睡眠资料比较

组别	AHI(次/h)	微觉醒指数(次/h)	SaO ₂ <90%的时间(分)	睡眠期间平均 SaO ₂ (%)	睡眠期间最低 SaO ₂ (%)
<60 岁正常血压组	45.7±8.3	30.4±3.3	6.5±2.4	94±1.4	90±3.2
<60 岁高血压组	55.1±3.6	29.4±4.8	23±6.9	90±2.2	85±2.5
>60 岁正常血压组	53.1±4.9	32.4±3.9	16±5.2	92±3.6	87±1.8

表 3 24h 血压及变异性比较

组别	白天收缩压			白天舒张压		
	均值(mmHg)	SD(mmHg)	CV	均值(mmHg)	SD(mmHg)	CV
<60 岁正常血压组	131±4.3	10.6	0.078	89±4.3	10.6	0.118
<60 岁高血压组	157±5.4	18.5 ^{△*}	0.119 ^{△*}	99±4.3	13.8 ^{△*}	0.139 ^{△*}
>60 岁正常血压组	136±5.7	13.3	0.093 [△]	79±5.4	10.2	0.123

组别	夜间收缩压			夜间舒张压		
	均值(mmHg)	SD(mmHg)	CV	均值(mmHg)	SD(mmHg)	CV
<60 岁正常血压组	111±2.3	12.6	0.111	71±2.6	12.6	0.177
<60 岁高血压组	149±6.2	20.5 ^{▲*}	0.137 ^{▲*}	91±3.73	17.8 ^{▲*}	0.195 ^{▲*}
>60 岁正常血压组	121±5.7	15.2	0.123	79±6.3	14.2	0.179

注:与<60 岁正常血压组相比,[△]*P*<0.05,[▲]*P*<0.01;与>60 岁正常血压组相比,**P*<0.05,**P*<0.01

表 4 靶器官损害情况比较

组别	超声或心电图左室肥厚(%)	蛋白尿(%)	眼底动脉硬化或出血(%)	腔隙性脑梗死(%)
<60 岁正常血压组	3	0	4	0
<60 岁高血压组	14.5* [△]	7* [*]	19* [*]	3* [*]
>60 岁正常血压组	4	3* [*]	11* [*]	2* [*]

注:与<60 岁正常血压组相比,**P*<0.05,**P*<0.01;与>60 岁正常血压组相比,**P*<0.05,[△]*P*<0.01

硬化的程度,但与<60 岁的血压正常者相比,>60 岁的血压正常者白天收缩压 CV 及靶器官损害(蛋白尿、眼底动脉硬化/出血、腔隙性脑梗死)明显增加,这说明年龄对动脉硬化确实存在一定的影响,随着年龄的增长,血压变异性增加,靶器官损害的危险增加。但是与呼吸暂停相比,年龄的影响是非常小的,本研究显示,与>60 岁的血压正常的 OSA 患者

相比,OSA 合并高血压患者,在体重、睡眠结构、最低夜间血氧饱和度方面没有显示出明显的差别,但血压变化的 SD 和血压 CV 明显增大,靶器官损害明显增加。说明了 OSA 增加血压变异性、引发靶器官损害的情况远远大于年龄致动脉硬化的作用。因此 OSA 对高血压患者血压变异性及靶器官损害的影响需要引起高度重视。

本研究显示,OSA 患者一旦发生高血压,同时存在血压变异性加大,这组人群的靶器官损害更为明显。因此,在临床工作中,对高血压患者尤其是年龄较大的合并 OSA 的高血压患者治疗时,不但要关注 OSA 是否存在,还要及时关注血压变异性及靶器官损害的情况。

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