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心房颤动血清 Lp-PLA2、BNP 与疾病严重程度相关性分析 *

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摘要 目的:分析心房颤动血清脂蛋白磷脂酶(A2Lp-PLA2)、脑钠肽(BNP)与疾病严重程度相关性分析,进而为此类疾病诊疗提供参考。**方法:**以本院住院诊疗的110例心血管疾病患者为主体,控制研究时间为2018年8月-2021年8月,全部患者诊疗资料均保存完整且根据有无房颤分为房颤组、无房颤组,各组均有55例。检测全部患者血清Lp-PLA2、BNP水平,同时实施超声心动图、心电图检查。**结果:**无房颤组血清Lp-PLA2、BNP水平显著较房颤组低, ($P<0.05$);无房颤组LVEDD、LAD水平明显高于房颤组,LVEF、E/A明显低于房颤组, ($P<0.05$);无房颤组患者中,心功能II级、III级、IV级患者的血清Lp-PLA2、BNP均明显低于房颤组中心功能II级、III级、IV级的患者, ($P<0.05$);血清Lp-PLA2与LVEDD呈负相关($r=-0.867, P<0.05$),与LAD呈负相关($r=-0.609, P<0.05$),与LVEF呈正相关($r=0.657, P<0.05$),与E/A呈正相关($r=0.785, P<0.05$),与心功能等级呈正相关($r=0.759, P<0.05$);BNP与LVEDD呈负相关($r=-0.769, P<0.05$),与LAD呈负相关($r=-0.701, P<0.05$),与LVEF呈正相关($r=0.645, P<0.05$),与E/A呈正相关($r=0.724, P<0.05$),与心功能等级呈正相关($r=0.729, P<0.05$)。**结论:**血清Lp-PLA2、BNP水平与心房颤动患者疾病严重程度密切相关,血清Lp-PLA2、BNP、心脏功能指标均参与了疾病的病理生理过程,其中血清Lp-PLA2和BNP与LVEF、E/A呈正相关,与LAD、LVEDD呈负相关,故临床认为血清Lp-PLA2、BNP是预测心房颤动患者风险程度的敏感指标,通过检测该指标水平,可了解机体心功能情况,有利于早期诊断疾病及评估病情发展情况。

关键词:心房颤动;血清Lp-PLA2;BNP;疾病严重程度

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Association Analysis of AF Serum Lp-PLA2 and BNP and Disease Severity*

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ABSTRACT Objective: The correlation of serum lipoprotein phosphatase (A2Lp-PLA2) and brain sodium peptide (BNP) and disease severity was analyzed, so as to provide reference for the diagnosis and treatment of such diseases. **Methods:** A total of 110 patients with cardiovascular disease who were hospitalized in our hospital were used as the main body. The control study period was from August 2018 to August 2021. All patients' diagnosis and treatment data were kept intact and were divided into atrial fibrillation group, atrial fibrillation group, and atrial fibrillation group according to their presence or absence. There were 55 cases in each group without atrial fibrillation. Serum levels of Lp-PLA2 and BNP were detected in all patients, and echocardiography and electrocardiography were performed at the same time. **Results:** The levels of serum Lp-PLA2 and BNP in the non-AF group were significantly lower than those in the AF group, ($P<0.05$); the levels of LVEDD and LAD in the non-AF group were significantly higher than those in the AF group, and LVEF and E/A were significantly lower than those in the AF group ($P<0.05$); in the patients without atrial fibrillation, the serum Lp-PLA2 and BNP of patients with cardiac function grades II, III and IV were significantly lower than those in the atrial fibrillation group of patients with cardiac function grades II, III and IV ($P<0.05$); Serum Lp-PLA2 was negatively correlated with LVEDD ($r=-0.867, P<0.05$), negatively correlated with LAD ($r=-0.609, P<0.05$), and positively correlated with LVEF ($r=0.657, P<0.05$), was positively correlated with E/A ($r=0.785, P<0.05$), positively correlated with cardiac function grade ($r=0.759, P<0.05$); BNP was negatively correlated with LVEDD ($r=-0.769, P<0.05$), negatively correlated with LAD ($r=-0.701, P<0.05$), positively correlated with LVEF ($r=0.645, P<0.05$), positively correlated with E/A ($r=0.724, P<0.05$), and positively correlated with cardiac function grade Correlation ($r=0.729, P<0.05$). **Conclusion:** The levels of serum Lp-PLA2 and BNP are closely related to the severity of the disease in patients with atrial fibrillation. Serum Lp-PLA2, BNP and cardiac function indexes are all involved in the pathophysiological process of the disease. Among them, serum Lp-PLA2 and BNP are closely related to LVEF, E/A is positively correlated with LAD and LVEDD, so it is clinically believed that serum Lp-PLA2

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and BNP are sensitive indicators for predicting the risk level of patients with atrial fibrillation. By detecting the level of this indicator, we can understand the body's cardiac function, which is conducive to early diagnosis of the disease and assess the progression of the disease.

Key words: Atrial fibrillation; Serum Lp-PLA2; BNP; Disease severity

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前言

心房颤动(Atrial fibrillation, AF)为临床较常见的心律失常疾病,好发对象为老年人群,流行病学数据显示,75-84岁间患者发病率高达12%,84岁以上患病率超过了33.3%^[1,2]。心房颤动的发生主要与心搏出血量减少,心房收缩丧失存在关系,可引起血流动力学损伤与血栓栓塞等现象,具有较高的病死率和致残率^[3]。相关研究数据发现,合并存在心房颤动患者的病死率是非心房颤动的1.4~1.9倍。对于心房颤动最为有效的治疗手段为射频消融术,但是疾病复发率是困扰医学界和患者的最大难题,早期预测疾病严重程度,对于干预疾病复发具有重要意义^[4,5]。脑钠肽(Brain Natriuretic Peptide, BNP)为心脏所分泌的肽类物质,能够反映心肌损伤、缺血、心室壁压力等情况,相关研究显示发生心房颤动后,该项指标明显升高^[6,7]。血清脂蛋白磷脂酶(Lipoprotein-associated phospholipase 2, A2Lp-PLA2)是一种由炎性细胞合成并分泌的物质,为近年来临床高度关注的一种与缺血性心脑血管疾病、动脉粥样硬化密切相关的炎性标记物^[8,9]。目前临床对于血清Lp-PLA2的研究,主要集中在冠心病方面,对于心房颤动患者的相关研究鲜有报道^[10]。本次研究通过回顾性分析方式选取医院2018年8月-2021年8月治疗的110例心血管疾病患者,旨在评价心房颤动血清Lp-PLA2、BNP与疾病严重程度相关性分析,报道内容如下。

1 资料与方法

1.1 一般资料

本次实验开始至结束日期为2018年8月-2021年8月,研究对象来自于医院诊治的110例心血管疾病患者,依据有无心房颤动实施分组,其中55例为房颤组,剩余55例为非房颤组。

房颤组中年龄区间是62~80岁,均值(71.03 ± 3.43)岁;病程是3~7个月,平均(5.03 ± 1.72)个月;男女比例是28:27;BMI为22~30 kg/m²,平均(26.05 ± 1.72) kg/m²。无房颤组中年龄区间是63~79岁,均值(71.07 ± 3.62)岁;病程是4~6个月,平均(5.07 ± 1.83)个月;男女比例是29:26;BMI为23~29 kg/m²,平均(26.08 ± 1.74) kg/m²。应用SPSS23.0软件分析基线资料,确定差异无统计学意义($P > 0.05$)。

纳入标准:研究对象满足伦理要求,获得《世界医学会赫尔辛基宣言》验证;研究资料保存完整;患者神志清楚,生命体征稳定;依据美国心脏病学会/欧洲心脏病协会/美国心脏病协会房颤治疗指南3P分类诊断^[11];根据患者症状、体征、病史、X线胸片、超声心动图进行综合判断;心功能分级参考纽约心脏病协会^[12]。

排除标准:剔除自身免疫系统疾病;认知功能异常;传染性

症、神经症等多种精神障碍;凝血机制障碍;先天性或者是风湿性心脏瓣膜病;合并心衰;严重肝肾功能障碍;颅内感染或者全身感染。

1.2 研究方法

全部患者均进行心电监护(PM-9000A+多参数监护仪),了解患者心率变化情况。采集各组患者晨起后的5 mL空腹静脉血,采血12 h前禁饮食,血液标本应用肝素抗凝,保证在30 min内完成检测。以3000 r/min离心处理(5 min),收集血清后检测BNP水平。以全自动化学发光免疫分析仪(CL-1000i)测定BNP水平,以酶联免疫吸附法测定血清Lp-PLA2,均严格按照规定标准进行检测。

超声心动图及心电图检查:由超声科医师开展心脏超声检查,所用彩色多普勒超声诊断仪型号为Philips IE33,频率为3.5 MHz探头实施检查,扫描速度调整为50 mm/s,频率是1.7~3.4 MHz。心尖四腔切面采取单平面改良Simpson测定,对于心脏射血分数(Left heart ejection fraction, LVEF)进行检测,同时测定左心室舒张末期内径(Left ventricular end-diastolic diameter, LVEDD)、左心房内径(Left Atrial Diameter, LAD)、E/A比值,连续检测5个心动周期后取平均值分析^[13,14]。予以全部患者心电图机检查,应用12导联心电图评价有无房颤。

1.3 观察指标

(1)比较房颤组、无房颤组患者的血清Lp-PLA2、BNP水平;(2)比较房颤组、无房颤组患者的LVEF、LVEDD、LAD、E/A比值水平;(3)分析不同心功能等级患者的血清Lp-PLA2、BNP水平,主要心功能等级为Ⅱ级、Ⅲ级、Ⅳ级;(4)分析血清Lp-PLA2、BNP水平与LVEF、LVEDD、LAD、E/A、心功能等级的相关性。

1.4 统计学处理

以SPSS23.0软件分析研究所涉及的数据,计量资料通过 $\bar{x} \pm s$ 表示,以t检验;计数资料通过相对数[n(%)]表示,以 χ^2 检验,组间P值<0.05时,差异存在意义。

2 结果

2.1 房颤组、无房颤组血清Lp-PLA2、BNP水平对比

无房颤组血清Lp-PLA2、BNP水平显著较房颤组低($P < 0.05$),测定数据见表1。

2.2 房颤组、无房颤组心脏超声检测结果分析

无房颤组LVEDD、LAD水平明显低于房颤组,LVEF、E/A明显高于房颤组($P < 0.05$),检测数据见表2。

2.3 不同心功能等级患者血清Lp-PLA2、BNP水平比较

无房颤组患者中,心功能Ⅱ级、Ⅲ级、Ⅳ级患者的血清Lp-PLA2、BNP均明显低于房颤组中心功能Ⅱ级、Ⅲ级、Ⅳ级的患者($P < 0.05$),测定数据见表3分析。

表 1 房颤组、无房颤组血清 Lp-PLA2、BNP 水平对比量表($\bar{x} \pm s$)Table 1 Comparison scale of serum Lp-PLA2 and BNP levels in atrial fibrillation group and without atrial fibrillation group($\bar{x} \pm s$)

Groups	Serum Lp-PLA2(ng/mL)	BNP(pg/mL)
No atrial fibrillation group(n=55)	139.27± 26.03	133.92± 20.72
Atrial fibrillation group(n=55)	376.36± 80.75*	381.27± 64.82*

Note: compared with the no atrial fibrillation group, * $P < 0.05$. The same below.

表 2 房颤组、无房颤组心脏超声检测结果分析量表($\bar{x} \pm s$)Table 2 Analysis scale of cardiac ultrasound examination results in atrial fibrillation group and without atrial fibrillation group($\bar{x} \pm s$)

Groups	LVEDD(mm)	LAD(mm)	LVEF(%)	E/A
No atrial fibrillation group(n=55)	46.29± 9.13	32.07± 5.47	63.17± 8.25	1.17± 0.42
Atrial fibrillation group(n=55)	50.72± 11.26*	34.86± 5.62*	60.52± 5.47*	0.83± 0.34*

表 3 不同心功能等级患者血清 Lp-PLA2、BNP 水平比较量表($\bar{x} \pm s$)Table 3 Comparison scale of serum Lp-PLA2 and BNP levels in patients with different cardiac function grades($\bar{x} \pm s$)

Groups	Cardiac function class	Serum Lp-PLA2	BNP(pg/mL)
No atrial fibrillation group(n=55)	Level II (n=26)	134.32± 20.57	134.52± 20.36
	Level II (n=26)	163.28± 31.53	172.36± 34.27
	Level IV(n=13)	192.63± 36.54	219.76± 43.26
	Level II (n=24)	221.08± 26.57*	172.36± 30.29*
Atrial fibrillation group(n=55)	Level III(n=17)	295.47± 70.22*	267.38± 40.93*
	Level IV(n=14)	374.26± 82.37*	398.65± 68.04*

2.4 相关性分析

血清 Lp-PLA2 与 LVEDD 呈负相关 ($r = -0.867, P < 0.05$), 与 LAD 呈负相关 ($r = -0.609, P < 0.05$), 与 LVEF 呈正相关 ($r = 0.657, P < 0.05$), 与 E/A 呈正相关 ($r = 0.785, P < 0.05$), 与心功能等级呈正相关 ($r = 0.759, P < 0.05$); BNP 与 LVEDD 呈负相关 ($r = -0.769, P < 0.05$), 与 LAD 呈负相关 ($r = -0.701, P < 0.05$), 与 LVEF 呈正相关 ($r = 0.645, P < 0.05$), 与 E/A 呈正相关 ($r = 0.724, P < 0.05$), 与心功能等级呈正相关 ($r = 0.729, P < 0.05$)。

3 讨论

心房颤动为临床常见的心律失常疾病之一, 疾病可造成机体血流动力学损害及血栓事件, 对于患者生活质量存在严重威胁。心房颤动是一种心房主导反折导致较多小反折环的房律紊乱, 疾病发作时患者心房激动频率高达 300-600 次/min, 心跳频率较快且不规则, 心律丧失了有效收缩功能^[15,16]。心房颤动患者主要临床症状是心悸、心绞痛、胸痛、呼吸困难、头晕、疲乏等, 国内心房颤共识定义于 2010 年将该疾病分为四类, 涉及初发房颤、阵发性房颤、持续性房颤、持久性房颤^[7]。研究显示, 心房颤动的发生与年龄、基础疾病密切相关, 高血压是最易发生心房颤动的心血管疾病, 且伴有房颤患者发生栓塞性并发症的风险更高^[18]。随着人口老龄化进程加快, 心房颤动发病率明显升高, 但疾病发生机制尚未明确, 近年来该疾病的发生与炎症反应、神经刺激的关系成为了热点^[19]。

经典的炎症介质学说为动脉粥样硬化疾病的干预、研究提

供了基础理论, 大量研究证实, 早期脂质条纹形成至动脉粥样斑块破裂期间, 多种炎症因子均有参与, 且在疾病发生发展过程中发挥了重要影响^[20,21]。虽然人们对于炎症介质已有十分深刻的认识, 相关诊疗手段、治疗效果均获得了理想效果, 但是每年均有数百万计的心房颤动患者发生, 故在较长一段时间内, 炎症介质与心房颤动患者间的关系成为了研究热点, 同时也是一项难以攻克的课题^[22,23]。本研究显示: 无房颤组血清 Lp-PLA2、BNP 水平显著较房颤组低; 无房颤组 LVEDD、LAD 水平明显低于房颤组, LVEF、E/A 明显高于房颤组; 无房颤组患者中, 心功能 II 级、III 级、IV 级患者的血清 Lp-PLA2、BNP 均明显低于房颤组中心功能 II 级、III 级、IV 级的患者; 血清 Lp-PLA2 与 LVEDD 呈负相关 ($r = -0.867, P < 0.05$), 与 LAD 呈负相关 ($r = -0.609, P < 0.05$), 与 LVEF 呈正相关 ($r = 0.657, P < 0.05$), 与 E/A 呈正相关 ($r = 0.785, P < 0.05$), 与心功能等级呈正相关 ($r = 0.759, P < 0.05$); BNP 与 LVEDD 呈负相关 ($r = -0.769, P < 0.05$), 与 LAD 呈负相关 ($r = -0.701, P < 0.05$), 与 LVEF 呈正相关 ($r = 0.645, P < 0.05$), 与 E/A 呈正相关 ($r = 0.724, P < 0.05$), 与心功能等级呈正相关 ($r = 0.729, P < 0.05$)。该结果与徐亮等人^[22]以及卢维维等人^[23]的报道具有一致性。分析可知: 血清 Lp-PLA2 是近年来新发现的一种与心房颤动相关的炎症因子, 可对局部动脉炎症反应进行介导, 可促进心房颤动发生, 且已经被推荐成为评估疾病风险的炎症标志物之一^[24,25]。血清 Lp-PLA2 主要是 441 个氨基酸残基组成的非钙依赖性的磷脂酶超家族成员, 编码为 LP-PLA2G7, 相对分子质量为 45.4kDa^[26]。

血清 Lp-PLA2 的分泌及活性主要受炎症介质调节,目前临床已经证实该项指标是通过其作用底物的分解产物促进心房颤动进展^[27]。本研究还发现,心血管疾病患者合并发生房颤后,其 BNP 水平显著升高,故认为该项指标同样可作为预测房颤的因子^[28]。BNP 是一种心室中合成多肽类神经激素,相较于同源代谢产物 NT-proBNP,BNP 具有稳定性好、半衰期长、临床检查简单等优点,因此被作为诊断心房颤动的标志物。其机制可能为心房颤动的发生引起机体血液动力学的改变,心房收缩下降,心输出量减少,另外 AF 时循环周期不规则可导致心输出量减少,加大肺动脉及心房压力,刺激心房肌细胞合成 BNP,导致血浆中 BNP 水平升高^[29,30]。因此血清 Lp-PLA2、BNP 与心房颤动密切相关。

综上所述,血清 Lp-PLA2、BNP 水平与心房颤动患者疾病严重程度密切相关,血清 Lp-PLA2、BNP、心脏功能指标均参与疾病的病理生理过程,其中血清 Lp-PLA2 和 BNP 与 LVEF、E/A 呈正相关,与 LAD、LVEDD 呈负相关,故临床认为血清 Lp-PLA2、BNP 是预测心房颤动患者风险程度的敏感指标,通过检测该指标水平,可了解机体心功能情况,有利于早期诊断疾病及评估病情发展情况。

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