

· 临床研究 ·

## 老年冠心病病变程度与血糖及颈动脉斑块的关系分析

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**【摘要】** 目的 探讨老年冠心病(CHD)病变程度与血糖及颈动脉斑块的关系。方法 以我院2015年12月~2018年11月268例疑似CHD且无糖尿病患者为研究对象,根据患者冠状动脉造影结果分为CHD组(170例)和非CHD组(98例);另根据Gensini评分将CHD分为轻度病变组(53例)、中度病变组(72例)和重度病变组(45例);分析CHD病变程度与其空腹血糖(FPG)及颈动脉斑块的关系。采用SPSS 20.0软件进行统计分析。计量资料以均数±标准差( $\bar{x}\pm s$ )表示,组间比较采用 $t$ 检验或方差分析;计数资料以例数(百分率)表示,组间比较采用 $\chi^2$ 检验。CHD发病危险因素采用logistic回归分析,CHD患者病变严重程度与血糖及颈动脉斑块相关性采用Pearson相关分析。**结果** CHD组FBG水平[(6.41±2.46)mmol/L]、斑块数目[(1.86±1.12)个]、颈动脉硬化等级积分[(2.16±1.32)分]、Crouse积分[(1.92±1.63)分]均高于非CHD组[(5.06±1.21)mmol/L,(0.53±0.61)个,(0.38±0.55)分,(0.66±0.57)分; $P<0.05$ ];重度病变组FPG[(6.82±1.67)mmol/L]水平、斑块数目[(2.93±1.24)个]、颈动脉硬化等级积分[(3.57±1.46)分]、Crouse积分[(3.87±2.24)分]明显高于中度病变组[(6.15±1.58)mmol/L,(1.64±1.72)个,(1.82±0.64)分,(2.13±0.85)分]与轻度病变组[(5.67±1.34)mmol/L,(0.67±0.69)个,(0.73±0.51)分,(0.96±0.62)分],且中度病变组明显高于轻度病变组( $P<0.05$ );logistic回归分析显示FPG水平、颈动脉硬化等级积分、Crouse积分是CHD发生的危险因素,且FPG水平、颈动脉硬化等级积分、Crouse积分与冠心病Gensini评分均呈正相关。**结论** 老年CHD患者FPG水平、斑块数目、颈动脉硬化等级积分、Crouse积分均高于非CHD患者;FPG水平、颈动脉硬化等级积分、Crouse积分是CHD发病的独立危险因素,与Gensini评分均呈正相关,在CHD病变的预测及病情评估中具有重要作用。

**【关键词】** 老年人;冠心病;血糖;颈动脉斑块

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## Relationship of the severity of coronary heart disease with blood glucose and carotid plaque in the elderly

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**【Abstract】 Objective** To investigate the relationship of the severity of coronary heart disease (CHD) with blood glucose and carotid plaque. **Methods** From December 2015 to November 2018, 268 non-diabetic patients with suspected CHD admitted to our hospital were selected and divided into CHD group ( $n=170$ ) and non-CHD group ( $n=98$ ) according to the results of coronary angiography. According to the Gensini score, the CHD patients were divided into mild group ( $n=53$ ), moderate group ( $n=72$ ) and severe group ( $n=45$ ). An analysis was made of the relationship between the severity of coronary heart disease and fasting blood glucose (FPG) and carotid plaque. Statistical analysis was performed using SPSS statistics 20.0. Measurement data were expressed as mean±standard deviation ( $\bar{x}\pm s$ ), and  $t$ -test or analysis of variance was used for comparison between groups. Numeration data were expressed as number of cases (%). Inter-group comparison was performed using  $\chi^2$  test. Logistic regression analysis was used to identify risk factors for CHD, and Pearson correlation analysis was performed for relationship of the severity of CHD with blood glucose and carotid plaque in patients. **Results** The FBG level [(6.41±2.46)mmol/L], the number of plaques (1.86±1.12), the carotid sclerosis level score (2.16±1.32), and the Crouse score (1.92±1.63) in the CHD group were significantly higher than those in the non-CHD group [(5.06±1.21)mmol/L, 0.53±0.61, 0.38±0.55, 0.66±0.57;  $P<0.05$ ]. The FPG level [(6.82±1.67)mmol/L], number of plaques

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( $2.93 \pm 1.24$ ), carotid sclerosis grade ( $3.57 \pm 1.46$ ) and Crouse score ( $3.87 \pm 2.24$ ) in severe CHD group were significantly higher than those in the moderate [ $(6.15 \pm 1.58)$  mmol/L,  $1.64 \pm 1.72$ ,  $1.82 \pm 0.64$ ,  $2.13 \pm 0.85$ ] and mild CHD group [ $(5.67 \pm 1.34)$  mmol/L,  $0.67 \pm 0.69$ ,  $0.73 \pm 0.51$ ,  $0.96 \pm 0.62$ ], and the moderate CHD group was significantly higher than the mild CHD group ( $P < 0.05$ ). Regression analysis showed that FPG level, carotid atherosclerosis grading score, Crouse score were risk factors for CHD, and that Gensini scores of CHD were positively correlated with FPG level, carotid atherosclerosis score, and Crouse score. **Conclusion** The FPG level, plaque number, carotid atherosclerosis score and Crouse score in elderly patients with CHD are significantly higher than in those with suspected CHD. FPG level, carotid atherosclerosis score and Crouse score are independent risk factors for CHD, having a positive correlation with CHD Gensini score and playing an important role in the prediction and assessment of CHD.

**【Key words】** aged; coronary heart disease; blood glucose; carotid plaque

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冠心病(coronary heart disease, CHD)是临床常见的心血管疾病,其致死率仅次于肿瘤,位于第2位<sup>[1,2]</sup>。CHD患者通常表现为心绞痛、闷胀感等,且随着我国居民生活水平的提高,CHD的发病率逐渐升高,严重影响了我国居民的生活质量。CHD的主要发病原因为动脉粥样硬化,此外还有高血脂、高血压、肥胖等。文献报道,血糖与CHD的关系密切相关,但是,目前关于CHD发病的独立危险因素尚存在较大争议<sup>[3-5]</sup>。冠状动脉造影术是临床诊断CHD的金标准,但是该方法对患者具有创伤性,且价格较高,不容易在临床推广。因此,CHD患者的预防及诊断等均是临床一直关注的热点<sup>[6,7]</sup>。本研究对我院老年CHD患者病变程度与血糖及颈动脉斑块的关系进行了分析,旨在探讨CHD的独立危险因素,为CHD的防控提供实证依据。

## 1 对象与方法

### 1.1 研究对象

以2015年12月至2018年11月在我院就诊的268例疑似CHD且无糖尿病患者为研究对象。纳入标准:(1)年龄 $\geq 60$ 岁,疑似CHD,无糖尿病史;(2)沟通能力较强,愿意配合完成本研究。排除标准:心功能不全;急性心肌梗死发病2周内;伴有恶性肿瘤;合并其他严重脏器疾病。冠心病诊断标准:患者有心绞痛、胸部闷胀感等临床表现,冠状动脉或其分支的直径狭窄程度 $\geq 50\%$ 为冠心病,冠状动脉造影检查结果显示冠状动脉或其分支的直径完全正常或狭窄 $< 50\%$ 者评为非CHD<sup>[4,5]</sup>。

### 1.2 方法

1.2.1 CHD病变程度 Gensini 评分 包括冠状动脉狭窄程度与病变部位2个方面。冠状动脉狭窄程度 $< 25\%$ 评1分,26%~50%评2分,51%~75%评4分,76%~90%评8分,91%~99%评16分,完全闭塞评32分。左主干病变评为5.0分,左前降支或回旋支近段部位病变评为2.5分,左前降支中段部位

病变评为1.5分,左前降支远段部位病变评为1.0分,回旋支中、远段部位病变评为1.0分,右冠状动脉部位病变评为1.0分,小分支病变评为0.5分。CHD患者每处病变部位的积分=狭窄程度评分 $\times$ 病变部位评分,其Gensini评分为每处病变部位积分之和。

1.2.2 Crouse 斑块积分 依据CHD患者颈动脉超声(北京坤泰德医疗科技有限公司)结果进行评估,颈动脉内膜中层厚度(intima-media thickness, IMT) $< 1.0$  mm为正常,评为0分; $1.0$  mm $\leq$  IMT $< 1.2$  mm为内膜增厚,评为1分;IMT $\geq 1.2$  mm为斑块形成。颈动脉存在斑块时:(1)未出现狭窄评为2分;(2)20% $\leq$ 血管狭窄程度 $< 50\%$ 评为3分;(3)50% $\leq$ 血管狭窄程度 $\leq 99\%$ ,评为4分;(4)颈动脉斑块将血管完全闭塞评为5分<sup>[9,10]</sup>。

1.2.3 实验室检测指标 实验室指标均在入院后第2天清晨采集空腹血(禁食12h),使用血生化分析仪进行检测,包括空腹血糖(fasting blood glucose, FBG)、糖化血红蛋白(hemoglobin A1c, HbA1c)、甘油三酯(triglycerides, TG)、总胆固醇(total cholesterol, TC)、总胆红素(total bilirubin, TBIL)等。

1.2.4 研究对象分组 根据患者冠状动脉造影结果分为CHD组(170例)和非CHD组(98例);另根据Gensini评分将CHD患者分为轻度病变组(53例, Gensini积分 $< 20$ )、中度病变组(72例, Gensini积分在20~40)和重度病变组(45例, Gensini积分 $> 40$ )<sup>[6-8]</sup>。

### 1.3 统计学处理

采用SPSS 20.0软件进行统计分析。计量资料以均数 $\pm$ 标准差( $\bar{x} \pm s$ )表示,组间比较用 $t$ 检验或方差分析;计数资料以例数(百分率)表示,组间比较采用 $\chi^2$ 检验。CHD发病危险因素采用logistic回归分析,CHD患者病变严重程度与血糖及颈动脉斑块相关性采用Pearson相关分析。 $P < 0.05$ 为差异有统计学意义。

## 2 结果

### 2.1 CHD组与非CHD组患者临床资料比较

非CHD组与CHD组的年龄、性别、TC及FBG的差异有统计学意义( $P < 0.05$ ); HbA1c、TG及TBIL差异无统计学意义( $P > 0.05$ ;表1)。

### 2.2 CHD组与非CHD组患者颈动脉斑块指标比较

CHD组斑块数目、颈动脉硬化等级积分、Crouse积分均高于非CHD组[分别( $1.86 \pm 1.12$ ) vs ( $0.53 \pm 0.61$ )个, ( $2.16 \pm 1.32$ ) vs ( $0.38 \pm 0.55$ )分, ( $1.92 \pm 1.63$ ) vs ( $0.66 \pm 0.57$ )分], 差异有统计学意义( $P < 0.05$ ;表2)。

### 2.3 不同病变程度CHD患者血糖及颈动脉斑块指标比较

重度病变组FPG水平、斑块数目、颈动脉硬化等级积分、Crouse积分明显高于中度病变组与轻度病变组,且中度病变组明显高于轻度病变组( $P < 0.05$ ;表3)。

### 2.4 CHD患者发病危险因素分析

logistic回归分析显示FPG水平、颈动脉硬化等级积分、Crouse积分是CHD发生的危险因素(表4)。

### 2.5 CHD患者病变严重程度与血糖及颈动脉斑块相关性分析

Pearson分析显示,FPG水平( $r = 0.432, P < 0.05$ )、颈动脉硬化等级积分( $r = 0.527, P < 0.05$ )、Crouse积分( $r = 0.656, P < 0.05$ )与冠心病Gensini评分均呈正相关。

## 3 讨论

CHD发病机制较复杂。文献报道,糖尿病可导致患者体内代谢发生紊乱,脂质、血小板等的紊乱导致患者血管发生变化,引起心脑血管疾病,而目前,非糖尿病患者血糖对CHD影响的相关研究并不多<sup>[9,10]</sup>。另外,患者血液中的脂质能够与内膜下蛋白多糖结合,聚集于内皮细胞,从而造成动脉粥样硬化。单核巨噬细胞能够吞噬低密度脂蛋白,进而分化为巨噬细胞,这些巨噬细胞表面的清道夫受体在

表1 CHD组与非CHD组患者临床资料比较

Table 1 Comparison of clinical data between CHD and non-CHD patients

Group	n	Age (years, $\bar{x} \pm s$ )	Male [n(%)]	FBG (mmol/L, $\bar{x} \pm s$ )	HbA1c (mmol/L, $\bar{x} \pm s$ )	TG (mmol/L, $\bar{x} \pm s$ )	TC (mmol/L, $\bar{x} \pm s$ )	TBIL (mmol/L, $\bar{x} \pm s$ )
CHD	170	69.42±11.53	133(78.24)	6.41±2.46	2.28±0.43	1.92±1.57	4.18±0.79	13.29±6.31
Non-CHD	98	67.13±10.62	65(66.33)	5.06±1.21	2.22±0.41	1.63±1.08	3.91±0.95	13.11±6.06
$\chi^2/t$		3.069	5.095	2.932	1.216	1.035	1.836	0.982
P value		0.033	0.024	0.041	0.072	0.127	0.045	0.436

CHD: coronary heart disease; FBG: fasting blood glucose; HbA1c: hemoglobin A1c; TG: triglycerides; TC: total cholesterol; TBIL: total bilirubin.

表2 CHD组与非CHD组患者颈动脉斑块指标比较

Table 2 Comparison of carotid plaque indicators between CHD and non-CHD patients ( $\bar{x} \pm s$ )

Group	n	Plaque number	Carotid atherosclerosis grading score	Crouse score
CHD	170	1.86±1.12	2.16±1.32	1.92±1.63
Non-CHD	98	0.53±0.61	0.38±0.55	0.66±0.57
t		2.029	2.674	1.865
P value		0.002	<0.001	0.012

CHD: coronary heart disease.

表3 不同病变程度CHD患者血糖及颈动脉斑块指标比较

Table 3 Comparison of blood glucose and carotid plaque indices in patients with different degrees of CHD ( $\bar{x} \pm s$ )

CHD degree	n	FBG(mmol/L)	Plaque number	Carotid atherosclerosis grading score	Crouse score
Severe	45	6.82±1.67 <sup>**</sup>	2.93±1.24 <sup>**</sup>	3.57±1.46 <sup>**</sup>	3.87±2.24 <sup>**</sup>
Moderate	72	6.15±1.58 <sup>*</sup>	1.64±1.72 <sup>*</sup>	1.82±0.64 <sup>*</sup>	2.13±0.85 <sup>*</sup>
Mild	53	5.67±1.34	0.67±0.69	0.73±0.51	0.96±0.62

CHD: coronary heart disease; FBG: fasting blood glucose. Compared with mild group, <sup>\*</sup> $P < 0.05$ ; compared with moderate group, <sup>#</sup> $P < 0.05$ .

表4 CHD患者发病危险因素分析

Table 4 Analysis of risk factors for CHD patients

Item	OR	95%CI	P value
Age	1.02	0.58-1.12	0.104
Gender	0.84	0.52-1.06	0.218
FBG	1.57	1.28-1.91	0.009
TC	0.87	0.57-1.38	0.186
Plaque number	1.31	1.24-1.57	0.078
Carotid atherosclerosis grading score	1.27	1.18-1.66	0.012
Crouse score	2.73	1.63-2.84	0.020

CHD: coronary heart disease; FBG: fasting blood glucose; TC: total cholesterol.

接到脂质的过度摄取信号后,可促使泡沫细胞形成,聚集在内皮细胞,逐步形成斑块,而这些斑块又会进一步刺激细胞因子的释放,提高巨噬细胞的吞噬作用<sup>[11,12]</sup>。颈动脉是人体主要的动脉血管,负责将血液输送至心脏、大脑等重要器官<sup>[13,14]</sup>。临床研究显示,冠状动脉斑块的形成与颈动脉斑块的形成有密切关系,外周颈动脉斑块的形成对CHD的病情评估及早期诊断有一定的关联,也与CHD的发生具有一定的关系。目前,CHD的诊断金标准为冠状动脉造影,此方法不仅会对患者造成损伤,而且花费较高。而颈动脉位置表浅,超声检测不仅方便,而且成本较低<sup>[15,16]</sup>。

本研究对我院CHD与非CHD患者血糖及颈动脉斑块的关系进行了分析,结果显示,CHD患者年龄、男性、TC及FBP均高于非CHD组,而其HbA1c、TG、TBIL与非CHD组无显著差异,提示CHD的发生与患者年龄、男性、TC及FBP均有关。CHD组斑块数目、颈动脉硬化等级积分、Crouse积分均高于对照组,提示CHD的发生与颈动脉斑块数目、颈动脉硬化等级积分、Crouse积分有关。重度病变组FPG水平、斑块数目、颈动脉硬化等级积分、Crouse积分均高于中度与轻度病变组,且中度病变组高于轻度病变组,提示CHD病情的严重程度与患者FPG水平、斑块数目、颈动脉硬化等级积分、Crouse积分有关。分析原因,可能为随着患者年龄的增长,患者体内的血糖、血脂等代谢紊乱程度较重,而血糖水平升高会造成患者体内代谢紊乱,脂质水平升高,进一步造成动脉血管斑块的逐步形成,从颈动脉流经心脏的血液,促进了CHD的形成及发展。logistic回归分析显示,CHD的发病与FPG水平、颈动脉硬化等级积分、Crouse积分有关,是CHD发生的危险因素。Pearson相关分析显示,FPG水平、颈动脉硬化等级积分、Crouse积分与冠心病

Gensini评分均呈正相关,提示CHD与血糖及颈动脉斑块关系密切,FPG水平、颈动脉硬化等级积分、Crouse积分可作为早期预防CHD的指标,并对CHD的病情严重程度评估具有一定作用。

综上所述,老年CHD患者斑块数目、颈动脉硬化等级积分、Crouse积分、FPG水平明显高于疑似CHD患者,且颈动脉硬化等级积分、Crouse积分、FPG水平是CHD发病的独立危险因素,与Gensini评分均呈正相关,在CHD病变的预测及病情评估中具有重要作用。

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