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·临床研究·

低骨密度与老年冠心病关系的研究

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摘要:**目的** 探讨老年人群低骨密度(包括骨质疏松和骨量减少)与冠心病的相关性。**方法** 回顾性分析 130 例我院经冠脉造影确诊为冠心病的老年患者,根据检查结果,分为冠心病组及非冠心病组;根据双能 X 线骨密度仪检查结果分为骨质疏松组、骨量减少组和骨量正常组,比较三组间冠心病发病率的差异,进一步分析低骨密度与冠心病的关系。**结果** (1)冠心病组与非冠心病组在年龄、高血压病、吸烟、糖尿病、服用他汀类药物、血清肌酐、血高密度脂蛋白胆固醇 <40 mg/dL 两组间比较均有显著性差异($P<0.01$);在体质指数(BMI)、性别、冠心病家族史、服用影响骨密度的药物(钙剂、类固醇激素及双膦酸盐类)、血低密度脂蛋白胆固醇 >130 mg/dL、血清钙离子水平两组间比较均无统计学差异。(2)骨量减少组及骨质疏松组冠心病的发病率明显高于骨量正常组,3 组间比较有统计学差异($P<0.01$)。(3)与冠心病的危险因素比较,低骨密度、糖尿病、高血压的相对危险度分别为 20.1、3.12、4.85。**结论** 低骨密度组的冠心病发病率高于骨量正常组,低骨密度与冠心病的发病存在一定的相关性。

关键词:冠心病;低骨密度;老年人

The relation between low bone mineral density and coronary heart disease in the elderly

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Abstract: **Objective** To investigate the relation between coronary heart disease (CHD) and low bone mineral density (BMD, including osteoporosis and osteopenia) in the elderly. **Methods** A retrospective analysis of 130 elderly CHD patients diagnosed by coronary angiography was conducted in our hospital. According to the results, the patients were divided into CHD group and non-CHD group. In addition, the patients were divided into osteoporosis group, osteopenia group and the normal group based on BMD results by dual-energy X-ray absorptiometry. Difference of the incidence of CHD among the 3 groups was compared. The relationship between low BMD and CHD was further analyzed. **Results** 1) There were significant differences in age, hypertension, smoking, diabetes, statins, serum creatinine, and high-density lipoprotein cholesterol <40mg/dl between CHD and non-CHD group ($P<0.01$). There were no statistically significance between the two groups in the body mass index (BMI), gender, family history of CHD, drugs affected BMD (calcium, steroids and bisphosphonates), low-density lipoprotein cholesterol >130mg/dl, and levels of serum calcium. 2) The incidence of CHD in the osteopenia group and osteoporosis group was significantly higher than that in normal group, and the difference was statistically significant among the 3 groups ($P<0.01$). 3) Compared with the traditional risk factors of CHD, the relative risks of low BMD, diabetes, hypertension were 20.1, 3.12, and 4.85, respectively. **Conclusion** The incidence of CHD in the low BMD groups is higher than that in normal group. There is a certain correlation between incidence of CHD and low BMD.

Key words: Coronary heart disease; Low bone mineral density; The elderly

冠心病和骨质疏松已成为威胁老年人身体健康和影响其生活质量的主要疾病,随着人口老龄化,骨质疏松发病率明显升高,已跃居世界常见病的第七位[1]。这两种疾病最早被认为与年龄相关,之后越来越多的证据表明两者间有着共同的危险因素,如血脂异常、糖尿病、肾功能衰竭、吸烟、缺乏运动等,以及共同的病理生理机制,如骨骼矿化和血管钙化具有相同的过程、氧化应激、炎症因子、维生素 D 受体多态性等[2]。已有研究表明,随着年龄增长,骨

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质流失,导致骨密度降低,与冠心病发病率的升高有一定相关性,本文旨在通过回顾性分析我院相关数据资料探讨低骨密度与老年冠心病间的关系。

1 材料和方法

1.1 一般资料

收集我院2011 年8 月 -2013 年8 月期间,先后行双能 X 线骨密度检查及冠状动脉造影的老年患者 130 例,其中男性 28 例,年龄在 65 ~88 岁,女性 112 例,年龄 60 ~82 岁,均绝经 5 年以上。通过搜索病历数据库和电话访问获得以下资料:1、BMI(体重(kg)/身高的平方(m^2));2、绝经年限;3、是否吸烟及有无冠心病家族史;4、是否服用以下可影响骨密度的药物:钙剂、类固醇激素、雌激素、他汀类、双膦酸盐类药物;5、肝肾功能、血脂、血钙、血糖;6、并存的可影响骨密度的疾病:高血压病、糖尿病、甲状旁腺功能亢进、恶性肿瘤等。所有入组病例均无服用雌激素史,也无甲状旁腺功能亢进和恶性肿瘤病史。冠心病诊断符合 1979 年 WHO 诊断标准,根据冠脉造影结果分为冠心病组和非冠心病组。根据中国老年学会分会骨质疏松委员会制定的诊断标准,对骨密度测定结果分为骨质疏松组、骨量减少组、骨量正常组。

1.2 方法

1.2.1 骨密度测定及判断:所有病人均采用 HOLOGIC Discovery 双能 X 线骨密度仪测定患者腰椎 1-4(L_1-L_4)正侧位、股骨近端(左侧)及 Ward 区等不同部位的骨密度值,结果以 T-Score(*T* 值)表示,*T* 值 > = -1.0 为正常; -1.0 < *T* 值 < -2.5 为骨量减少;*T* 值 < = -2.5 为骨质疏松。

1.2.2 冠脉造影及结果判断:所有病人均采用德国 SIEMENS Artis Zee 造影仪(配有数字成像系统,冠状动脉定量分析软件),以 Jundins 法,常规投照体位显示左、右冠状动脉情况。按左主干、左前降支、左回旋支、右冠状动脉进行分段分析,至少有一支冠状动脉或其大分支内径狭窄≥50% 作为诊断冠心病的标准。

1.3 统计学处理

采用 SPSS18.0 统计软件,计量资料以均数 ± SD 表示,两样本均数的比较采用 *t* 检验,计数资料采用 χ^2 检验,相关性分析采用 Logistic 回归分析,设 *P* <0.05 为差异有统计学意义。

2 结果

2.1 冠状动脉造影结果

根据冠脉造影结果分为冠心病组和非冠心病组,基本资料见表 1。在年龄、高血压病、吸烟、糖尿病、服用他汀类药物、血清肌酐、血高密度脂蛋白胆固醇(HDL-C) <40mg/dL 均两组间比较有显著性差异(*P* <0.01)。体质指数(body mass index, BMI)、性别、冠心病家族史、摄入可影响骨密度药物(钙剂、类固醇激素及双膦酸盐类)、血低密度脂蛋白胆固醇(LDL-C) >130 mg/dL、血清钙离子水平两组间比较均无统计学意义。

表 1 冠心病组和非冠心病组基本资料比较($\bar{x} \pm s$)

Table 1 Comparison of the basic information between CHD and non-CHD group($\bar{x} \pm s$)

项目	冠心病组 (CHD group) (*n* =64)	非冠心病组 (Non-CHD group) (*n* =66)	*P* 值 (*P* value)
年龄 (Age)	73.3 ±6.07	68.7 ±7.12	0.000
BMI(kg/m^2)	22.9 ±1.55	22.4 ±1.66	0.097
女性 (Female)	46(45.1%)	56(54.9%)	0.056
高血压病 (Hypertension)	50(59.5%)	34(40.5%)	0.001
吸烟 (Cigarette smoker)	14(87.5%)	2(12.5%)	0.001
糖尿病 (Diabetes mellitus)	32(76.2%)	10(23.8%)	0.000
冠心病家族史 (Family history of CAD)	8(57.1%)	6(42.9%)	0.366
钙剂 Calcium supplement	6(42.9%)	8(57.1%)	0.413
类固醇激素 (Steroids)	24(57.1%)	18(42.9%)	0.145
他汀药物 (Statins)	34(73.9%)	12(26.1%)	0.000
双膦酸盐类 (Bisphosphonates)	10(71.4%)	4(28.6%)	0.095
LDL-C >130 mg/dL	8(40%)	12(60%)	0.257
HDL-C <40 mg/dL	16(66.7%)	8(33.3%)	0.047
血清肌酐(mmol/L) (Creatinine)	89.2 ±32.3	71.7 ±32.7	0.003
血清钙(mmol/L) (Calcium)	2.24 ±0.150	2.28 ±0.116	0.098

2.2 骨密度与冠心病

骨量减少组及骨质疏松组冠心病的发病率明显高于骨量正常组,3 组间比较均有统计学意义(*P* <

0.01),见表 2。相关分析结果进一步证实低骨密度与冠心病发生具有相关性,见表 3。

表 2 不同程度骨密度组冠心病发病率的比较

Table 2 Comparison of the incidences of CHD among the groups with different levels of BMD

项目	例数 (n)	非冠心病组 (Non-CHD group)	冠心病组 (CHD group)
骨量正常 (Normal group)	36	30	6
骨量减少 (Osteopenia group)	34	14	20#
骨质疏松 (Osteoporosis group)	60	22	38#

注:与骨量正常组比较 #$P<0.01$

Note: #P value <0.01 when compared with the normal group

表 3 多变量回归分析低骨密度与冠心病的相关性

Table 3 Correlation between low BMD and CHD by multivariate regression analysis

变量名称 (Variables)	OR 值 (Odds ratio)	95% 可信区间 (95% confidence interval)	P 值 (P value)
低骨密度 (Low BMD)	20.1	3.85 – 105.4	0.000
糖尿病 (Diabetes mellitus)	3.12	1.23 – 7.91	0.017
高血压病 (Hypertension)	4.85	2.04 – 11.5	0.000

3 讨论

众所周知,冠心病的危险因素包括:年龄、吸烟、糖尿病、高血压病、血脂异常等,已被大量的循证医学证据证明,本研究也显示上述危险因素在老年冠心病组明显高于非冠心病组。尽管两组患者平均血肌酐水平在正常范围,但分别有 9.38%(冠心病组)和 3.03%(非冠心病组)的患者血肌酐水平高于正常范围,而且冠心病组的平均血肌酐水平明显高于非冠心病组,由此可见,随着血肌酐水平的升高,冠脉病变的发病率有增加的趋势。国内也有研究表明[3],肾功能降低是冠心病病变的重要危险因素,肾功能降低与冠状动脉狭窄程度独立相关。继糖尿病之后,慢性肾功能不全已成为冠心病的第二个等危症。

研究结果显示,在老年人群中两低骨密度组分别与骨量正常组比较,冠心病发病率明显较后者上升,且低骨密度与冠心病有一定相关性,这与之前的一些研究结果相符[4,5],但具体机制尚未阐明。两者除一些共同的高危因素之外,如高龄、高血压、糖尿病、吸烟、缺乏运动等,还存在共同的致病途径。血管钙化是一个持续进展的过程,与骨骼的矿化有一些共同的特征。随着年龄的增加,骨钙减少,自骨骼游离出的钙离子在动脉内膜中异位沉积增多从而促进了血管壁粥样硬化或钙化。特别是羟磷灰石是骨骼矿物相的重要组成成分,也被发现随钙沉积在粥样斑块中[6]。骨密度下降越多,说明骨钙流失越严重,血管钙化程度与骨密度下降程度成正相关[7]。本研究中冠心病组和非冠心病组血钙水平无显著性差异,而冠心病组低骨密度数明显多于非冠心病组,据此推测,低骨密度患者骨骼中溶出的钙离子可能一部分沉积于血管壁中,从而加速了动脉粥样硬化的发生和发展。在钙化的动脉粥样斑块中还发现表达几种骨基质蛋白,如 Gla 蛋白、骨形态形成蛋白 –2、骨桥蛋白、骨钙素、Ⅰ型胶原[8]。此外,一些基因的突变也可同时引发早期动脉粥样硬化和骨质疏松[9]。超敏 CRP、IL –6、同型半胱氨酸等炎症因子,不仅促进了动脉粥样硬化的发生、发展,而且也参与并调控骨骼矿化的过程[10]。

本研究的局限之处在于,缺乏维生素 D、甲状旁腺激素(PTH)以及一些炎症因子的数据。维生素 D 不仅可维持人体钙磷浓度稳定,促进骨骼矿化,而且也与心血管疾病相关。PTH 水平升高可使骨钙动员入血,产生“钙搬家”现象,体循环中的钙可沉积在动脉壁内膜中,造成血管壁粥样硬化、钙化,使血管顺应性降低。从多因素 Logistic 回归分析结果可以看出,低骨密度、糖尿病、高血压病均与冠心病存在相关性,然而糖尿病、高血压病早已成为冠心病的独立危险因素,那么低骨密度是否可能成为冠心病的危险因素呢? 从基础的病理生理机制看两者存在内在联系,而相关性分析结果显示低骨密度与冠心病存在相关性,但其 OR 值的 95% 可信区间范围较大,这可能与本研究样本量较小,导致样本离散程度较大,结果尚需扩大样本量的随机对照性前瞻研究来进一步证实,可能为今后冠心病的防治提供新的思路和策略。

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