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常规心电图与冠脉造影术在冠心病诊断中的效果分析

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摘要 目的:探讨常规心电图(ECG)与冠脉造影术(CAG)在冠心病诊断中的效果。**方法:**选取 100 例冠心病患者,入院后先行 CAG,后经 ECG 检查,通过 CAG 检查的冠脉狭窄程度、冠脉病变支数与 ECG 检查结果的对比两种检查方法对冠心病诊断结果,评价 ECG 与 CAG 在冠心病诊断中的临床价值。**结果:**CAG 诊断冠心病的阳性诊断率 82.0%,ECG 诊断冠心病阳性诊断率为 79.0%,两组阳性诊断率相比,无统计学差异($P>0.05$)。ECG 对三组冠心病患者的灵敏度分别为 65.0%、92.6%、96.9%,冠脉狭窄程度 50%-70%时,灵敏度低于其他两组($P<0.05$)。经 CAG 诊断为冠脉单支病变、双支病变、三支病变患者,采用 ECG 诊断时,组间灵敏度相比,差异有统计学意义($P<0.05$)。**结论:**ECG 多支病变冠心病患者容易出现漏诊、误诊情况,CAG 与 ECG 诊断灵敏度相当,可直观反映冠脉病变情况。

关键词:常规心电图;冠脉造影术;冠心病;灵敏度;特异性

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Efficacy of Routine ECG and CAG in the Diagnosis of Coronary Heart Disease

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ABSTRACT Objective: To discuss the efficacy of ECG and CAG in the diagnosis of coronary heart disease. **Methods:** Selecting 100 cases of coronary heart disease patients. They were given CAG first, then ECG. The efficacy of ECG and CAG in the diagnosis of coronary heart disease was evaluated by diagnosis of coronary heart disease, degree of coronary artery stenosis, the number of coronary artery lesions by CAG. **Results:** The diagnosis rate of coronary artery stenosis was 82.0% by CAG and 79.0% by ECG. There were no statistical significance on diagnosis rate between two groups($P>0.05$). From results, the sensitivity was 65.0%, 92.6% and 96.9% in 3 groups. When the degree of coronary artery stenosis was 50%-70%, the sensitivity was lower than that of other two groups ($P<0.05$). The coronary artery stenosis was diagnosed as single vessel disease, double vessel disease and three vessel disease. When using ECG, the sensitivity had no statistical difference among groups($P>0.05$). **Conclusion:** ECG had high sensitivity on coronary artery stenosis. The detection was convenient and noninvasive. But the misdiagnosis was still existed. The CAG had equal sensitivity with ECG. It could reflect the situation of coronary lesions directly. But the examination was limited because of traumatic.

Key words: ECG; CAG; Coronary heart disease; Sensitivity; Specificity

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前言

冠心病是临床常见的心内科疾病,多由冠状动脉粥样硬化引起,起病较隐匿,常可突然发作导致严重后果,甚至猝死,因此早期诊断与治疗具有重要的临床意义^[1]。CAG 是诊断冠心病的金标准,但该种检查方式具有创伤性,可引起术中和术后并发症,且费用较高^[2,3]。ECG 检查具有简单、快速、无创性等特点,但往往依靠心电图 ST-T 段异常波动来诊断冠心病,但存在漏诊和误诊现象^[4]。两种诊断方式相比各有优缺点,为了对比两种方法在冠心病诊断中的临床价值,本研究回顾性分析我院收治

的 100 例冠心病患者的临床资料,现报道如下。

1 资料与方法

1.1 病例资料

选取我院 2011 年 4 月 -2014 年 4 月心血管内科收治的冠心病患者 100 例。其中,男 74 例,女 26 例,年龄 58-78 岁,平均年龄 56.21 ± 9.37 岁。纳入标准:①符合国际心脏病学会关于冠心病的诊断标准^[5,6];②临床表现为冠心病胸痛、心律失常;③经本院伦理委员会同意,治疗前患者均签署书面知情同意书。排除标准:先天性心血管病,心肌梗死病史,电解质紊乱,检查前服用可改变心电图 ST 段的药物,暂时或永久性左右束支传导阻滞的患者。患者入院后先行 CAG 检查,后行 ECG 检查。

1.2 诊断方法

冠状动脉造影:采用飞利浦 2000 全数字化心血管造影机。经桡动脉或股动脉穿刺,取多部位投照,进行选择左、右冠状

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动脉造影,以通用直径发确定冠状动脉是否狭窄,冠状动脉左主干、左前降支及粗大的对角支、左旋支及右冠状动脉中任一狭窄 $\geq 50\%$ 者为阳性。

心电图:采用常规 12 导联体表心电图,冠心病诊断标准:ST 段压低 $>0.5\text{ mV}$,ST 段抬高 $>0.5\text{ mV}$ 及缺血 T 波低平、双向、倒置改变者为阳性。

1.3 观察指标

① 以 CAG 和 ECG 诊断冠心病,观察并记录冠心病呈阳性的例数;② 将 CAG 诊断的冠脉狭窄程度与 ECG 诊断结果进行对比;③ 将 CAG 诊断的冠脉病变指数与 ECG 诊断结果进行对比。

1.4 统计方法

采用 SPSS 17.0 统计软件分析,计数资料以%表示,采用卡方检验,以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 诊断结果比较

CAG 诊断冠心病的阳性诊断率 82.0%,ECG 诊断冠心病阳性诊断率为 79.0%,两种方法的阳性诊断率相比无统计学差异($P>0.05$)。以 CAG 诊断冠心病为金标准,ECG 诊断冠心病的敏感度为 84.1% (69/82),特异性为 44.4% (8/18),见表 1。

表 1 ECG 与 CTA 诊断冠心病的结果比较 [例(%)]

Table 1 Comparison of the diagnosis of CHD between CAG and ECG [n(%)]

ECG	CAG		
	Positive	Negative	Total
Positive	69	10	79
Negative	13	8	21
Total	82	18	100

2.2 ECG 对不同冠脉狭窄程度冠心病患者的诊断价值比较

如表 2 所示,ECG 对不同冠脉狭窄程度冠心病患者的灵敏度分别为 65.0%、92.6%、96.9%,随着冠脉狭窄程度加深,

ECG 诊断的灵敏度总体上呈上升趋势,冠脉狭窄程度 50%-70%时,ECG 诊断的灵敏度低于其他两组($P<0.05$)。其他两组灵敏度相比,无统计学差异($P>0.05$)。

表 2 ECG 对不同冠脉狭窄程度冠心病患者的诊断价值比较[例(%)]

Table 2 Comparison of the diagnostic value of ECG for coronary artery stenosis patients with different degrees of coronary artery stenosis [n(%)]

Stenosis degree	Positive	Negative	Sensitivity
50%-70%	13	7	65.0%
70%-90%	25	2	92.6%
$>90\%$	31	1	96.9%

2.3 ECG 对不同冠脉病变支数冠心病患者的诊断价值比较

如表 3 所示,经 CAG 诊断为冠脉单支病变、双支病变、三

支病变患者,随着病变分支增多,ECG 诊断灵敏度逐渐下降($P<0.05$)。随着病变分支增多,ECG 诊断灵敏度逐渐下降。

表 3 ECG 对不同冠脉病变支数冠心病患者的诊断价值比较[例(%)]

Table 3 Comparison of the diagnostic value of ECG for coronary artery stenosis patients with different number of coronary artery stenosis[n(%)]

ECG narrow count (%)	Positive	Negative	Sensitivity
Single ramus	34	2	97.1%
Double rami	21	3	87.5%
Three rami	14	5	73.7%

Note: compared with the control group, $*P<0.05$.

3 讨论

冠心病是冠状动脉粥样硬化使血管腔狭窄,导致心肌缺血缺氧引起的心脏病,可引起心绞痛乃至心肌梗死等症状发生^[7],在我国具有较高的发生率,早期诊断与治疗可显著改善患者预后,提高其生活质量^[8,9]。目前诊断冠心病的方法有多种,如 CAG、ECG。ECG 诊断主要依靠患者心电活动的变化,冠心病患者的心电图可出现 ST 段压低或抬高、T 波倒置等 ST-T 改变^[12]。ECG 由于其快捷、简便、经济且无创的特点,广泛用于冠心病的诊断^[10,11]。但是当冠心病患者处于静息状态时,心脏负担较小,心电图不能反映心肌缺血变化,存在漏诊现象。此外,有 ST-T

改变的患者不一定是冠心病,各种原发性心肌病变、心肌炎及定位、体位、机器误差都有可能导导致心电图 ST-T 的改变^[13,14]。因此,仅依靠心电图 ST-T 改变不足以判断冠心病的发生。

CAG 时一种有创性检查,具有高分辨率、成像不受心率影响等特点,对冠心病的病变部位、范围、严重程度、血管壁的情况可作出准确的诊断,一旦发现冠状动脉狭窄,明显影响心肌供血,可当即实施介入治疗,即一次创伤可以解决诊断和治疗问题,而且术后 2-3 天就可出院,既节省时间又节约医疗资源^[15,16]。CAG 的缺点在于术中、术后均可能出现手术并发症,并且费用较高,不适用于所有冠心病患者,并且对手术设备及术者均有较高要求,普及度不如 ECG^[17,18]。

张义红等^[19]研究发现动态心电图与冠脉造影在阳性诊断率上无统计学差异($P>0.05$)。本研究中,CAG 诊断冠心病的阳性诊断率 82.0%,ECG 诊断冠心病阳性诊断率为 79.0%,两种检测方法的阳性诊断率相比也无统计学差异,与张义红研究相仿。ECG 与 CAG 诊断冠心病各有优缺点,ECG 方便对冠心病做早期评价,而 CAG 一旦检出冠脉狭窄位置就可以实施介入治疗。以 CAG 诊断冠心病为金标准,ECG 诊断冠心病的敏感度为 84.1% (69/82),特异性为 44.4% (8/18),说明 ECG 诊断灵敏度增高,但是特异性较低。魏文娟等^[20]采用心电图检查冠心病,发现当冠状动脉狭窄程度 $\geq 90\%$ 时,敏感度最高。冠状动脉狭窄程度 50%-70 者,70%-90%者灵敏度相比,无统计学差异($P>0.05$)。本研究中,随着冠脉狭窄程度加深,灵敏度总体上呈上升趋势。这是因为冠脉狭窄程度越严重,冠心病患者心电图 ST-T 段或 T 波的异常波动就越明显,显著减少假阴性结果,故灵敏度增加。当狭窄程度超过 70%时,ST-T 段或 T 波的异常波动就已经表现较为明显。进一步研究显示经 CAG 诊断为冠脉单支病变、双支病变、三支病变的患者采用 ECG 诊断时组间灵敏度相比差异有统计学意义($P<0.05$)。另一方面,随着病变分支增多,ECG 诊断灵敏度逐渐下降。CAG 证实为双支或者三支病变者,心电图多表现正常,因为当这类患者处于静息状态时,患者心肌血液供需重新达到平衡。此外,多支病变的血管容易相互对应,产生的缺血型 ST-T 段相互抵消,故 ST-T 段或 T 波无异常波动,未出现缺血性改变。这说明 ECG 不能排除 CAG 证实为双支或三支病变的冠心病患者。

综上所述,ECG 对冠心病的诊断具有较高的灵敏度,检测方便、无创,但对多支病变冠心病患者容易出现漏诊、误诊情况。冠脉造影术依然是冠心病的“金标准”,与 ECG 诊断灵敏度相当,可直观反映冠脉病变情况,但因检查方式有创伤性而使用受限。

参考文献(References)

- [1] Rothenbacher D, Jaensch A, Mons U, et al. Prognostic value of one-year course of symptoms of anxiety and depression in patients with coronary heart disease: Role of physical activity and unmet medical need[J]. Eur J Prev Cardiol, 2015, 22(9): 1129-1138
- [2] Pencina MJ, D'Agostino RB, Zdrojewski T, et al. Apolipoprotein B improves risk assessment of future coronary heart disease in the Framingham Heart Study beyond LDL-C and non-HDL-C [J]. Eur J Prev Cardiol, 2015, 22(10): 1321-1327
- [3] Batty GD, Shipley M, Smith GD, et al. Long term risk factors for coronary heart disease and stroke: influence of duration of follow-up over four decades of mortality surveillance[J]. Eur J Prev Cardiol, 2015, 22(9): 1139-1145
- [4] Han L, Wu Q, Wang C, et al. Homocysteine, Ischemic Stroke, and Coronary Heart Disease in Hypertensive Patients: A Population-Based, Prospective Cohort Study [J]. Stroke, 2015, 46 (7): 1777-1186
- [5] Das De S, Krishna S, Jethwa A. Iron status and its association with coronary heart disease: systematic review and meta-analysis of prospective studies[J]. Atherosclerosis, 2015, 238(2): 296-303
- [6] Mannsverk J, Wilsaard T, Mathiesen EB, et al. Trends in Modifiable Risk Factors Are Associated With Declining Incidence of Hospitalized and Nonhospitalized Acute Coronary Heart Disease in a Population[J]. Circulation, 2016, 133(1): 74-81
- [7] 于海波,韩雅玲,荆全民,等. 多种无创检查组合在冠心病诊断中的价值[J].现代生物医学进展, 2014, 14(9): 1668-1670
- [8] Yu Hai-bo, Han Ya-ling, Jin Quan-min, et al. The Value of Various Combinations of Non-invasive Examinations in the Diagnosis of Coronary Artery Disease [J]. Progress in Modern Biomedicine, 2014, 14(9): 1668-1670
- [9] 范咏梅,曾晨卉,容志毅,等. 运动试验假阴性而冠状动脉造影阳性冠心病的特点分析[J].现代生物医学进展, 2010, 10(13): 2542-2544
- [10] Fan Yong-mei, Zeng Chen-hui, Tong Zhi-yi, et al. Characteristics analysis of coronary heart disease patients with positive coronary angiography but false negative treadmill exercise test [J]. Progress in Modern Biomedicine, 2010, 10(13): 2542-2544
- [11] Mega JL, Stitziel NO, Smith JG, et al. Genetic risk, coronary heart disease events, and the clinical benefit of statin therapy: an analysis of primary and secondary prevention trials [J]. Lancet, 2015, 385(9984): 2264-2271
- [12] Mongraw-Chaffin ML, Peters SA, Huxley RR, et al. The sex-specific association between BMI and coronary heart disease: a systematic review and meta-analysis of 95 cohorts with 1.2 million participants[J]. Lancet Diabetes Endocrinol, 2015, 3(6): 437-449
- [13] Folsom AR, Gottesman RF, Appiah D, et al. Plasma d-Dimer and Incident Ischemic Stroke and Coronary Heart Disease: The Atherosclerosis Risk in Communities Study[J]. Stroke, 2016, 47(1): 18-23
- [14] Sun S, Zhang W, Chen X, et al. The CAA repeat polymorphism in the ZFX3 gene is associated with risk of coronary heart disease in a Chinese population[J]. Tohoku J Exp Med, 2015, 235(4): 261-266
- [15] Igarashi A, Fujito K, Hirano M, et al. Cost minimization analysis of beta-blocker at the time of CT imaging for suspected of coronary heart disease in Japan[J]. J Med Econ, 2014, 17(2): 142-147
- [16] Lu Q, Liu H. Correlation of ascending aorta elasticity and the severity of coronary artery stenosis in hypertensive patients with coronary heart disease assessed by M-mode and tissue Doppler echocardiography[J]. Cell Biochem Biophys, 2015, 71(2): 785-788
- [17] Shen J, Zhang J, Wen J, et al. Correlation of serum alanine aminotransferase and aspartate aminotransferase with coronary heart disease [J]. Int J Clin Exp Med, 2015, 8(3): 4399-4404
- [18] Jian-ling S, Ying Z, Yu-lian G, et al. Coronary heart disease diagnosis bases on the change of different parts in treadmill exercise test ECG [J]. Cell Biochem Biophys, 2013, 67(3): 969-975
- [19] Sun J, Rangan P, Bhat SS, et al. A Meta-Analysis of the Association between Helicobacter pylori Infection and Risk of Coronary Heart Disease from Published Prospective Studies [J]. Helicobacter, 2016, 21(1): 11-23
- [20] Bai MF, Gao CY, Yang CK, et al. Effects of thyroid dysfunction on the severity of coronary artery lesions and its prognosis [J]. J Cardiol, 2014, 64(6): 496-500
- [21] 张义红,田青. 冠心病心电图与冠脉造影结果的对比分析[J].四川医学, 2012, 33(3): 452-453
- [22] Zhang Yi-hong, Tian Qing. Comparative analysis of dynamic electrocardiogram and coronaryarteriography in coronary artery disease[J]. Sichuan Medical, 2012, 33(3): 452-453
- [23] 魏文娟,钱正明,黄建振,等. 冠状动脉影像学心电图检查诊断老年冠心病价值的对比研究[J].心电与循环, 2014, 33(6): 487-489
- [24] Wei Wen-juan, Qian Zheng-ming, Huang Jian-zhen, et al. Comparison of computed coronary angiography and ECG in diagnosis of coronary artery disease in elders [J]. Journal of Electrocardiology and Circulation, 2014, 33(6): 487-489