SCIENTIFIC LETTER

Clinical profile and outcome of coronary artery ectasia

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Coronary artery ectasia (CAE), a rare clinical condition, is defined as dilatation of the coronary artery 1.5 times greater than that of an adjacent normal segment.¹ It usually accompanies coronary artery disease (CAD). The clinical significance of CAE is not well defined and conflicting results have been reported.^{1–3} Our objective in this study was to examine the clinical characteristics of CAE and its prognosis.

METHODS

We retrospectively reviewed the coronary angiograms of 8812 patients between February 2001 and September 2004 at Koşuyolu Heart and Research Centre and Medical Park Hospital, Istanbul, Turkey. CAE was detected in 122 (1.38%) patients, 72 (59%) of whom had coexisting significant CAD defined as > 70% diameter stenosis of major coronary arteries or $\geq$ 40% stenosis of the left main stem (group A). Twenty nine patients (23.7%) had isolated CAE and 21 (17.2%) patients had accompanying non-significant CAD; together they were categorised as group B. Group C comprised 152 randomly chosen patients with significant CAD but without ectasia, matched for sex and age. The term ectasia was applied when most or all of the vessel was involved. The term aneurysm was applied in case of localised dilatation.³ Coronary aneurysms were detected in 53 (0.6%) patients and they were not included in the CAE groups. Patients with valve disease, cardiomyopathy, and previous coronary artery bypass grafting and percutaneous coronary intervention were excluded from the study. Hypertension was defined as blood pressure > 140/90 mm Hg on at least two consecutive measurements or treatment with hypertension drugs. Hyperlipidaemia was defined as fasting low density lipoprotein cholesterol > 4.14 mmol/l or triglyceride > 1.7 mmol/l. Obesity was defined as body mass index $\geq$ 30 kg/m². Follow-up data of the study patients were evaluated retrospectively and prospectively for a mean of 30 (SD 11) months. Data on hospital admissions with angina pectoris, myocardial infarction (MI), myocardial revascularisation and death were collected from hospital medical records, by clinical examination and by telephone questionnaire.

Data were analysed with the SPSS V.10.0 (SPSS Inc, Chicago, Illinois, USA) for Windows statistical package. Parametric variables were expressed as mean (SD) and categorical variables were expressed as percentages. Independent samples t test was used to determine differences in parametric variables and the χ^2 test was applied as appropriate for categorical data. A value of $p < 0.05$ was accepted as significant.

RESULTS

Table 1 summarises the clinical characteristics of the patients. Patients with and without ectasia (groups A and B v group C) did not differ with respect to age and sex. Hyperlipidaemia, hypertension and smoking were significantly more common among patients with ectasia than without CAE ($p < 0.001$, $p = 0.03$ and $p = 0.03$). Considering individual comparisons,

all three groups had similar prevalences of a history of angina, but the prevalence of previous MI was significantly lower in group B than in groups A and C (6%, 25% and 18.4% respectively) ($p = 0.03$ v group C, $p = 0.006$ v group A). Among patients with CAE, three had undergone repeat coronary angiography three times and 10 had undergone repeat angiography twice during the follow up.

In group A, 49 of 72 patients had CAE in one vessel (68%), 13 patients in two vessels (18.1%) and 10 in three vessels (13.9%). The total number of ectatic vessels was 105, with the following distribution: 40.9% in the right coronary artery (RCA), 31.4% in the left anterior descending artery (LAD), 24.8% in the circumflex artery and 2.8% in the left main coronary artery. In group B, in patients with non-significant CAD the vessel distribution was similar, whereas 18 of 29 patients with isolated ectasia had two-vessel involvement (62%) and six had three-vessel involvement (20.7%). Of the 59 isolated ectatic vessels 26 were the RCA (44%), 22 were the circumflex artery (37.3%), 10 were the LAD (16.9%) and one was the left main coronary artery (1.7%).

Follow-up data were obtained for 92 patients with CAE and 114 patients with CAD (table 2). Although unstable angina pectoris was more common in group A ($p < 0.001$ v group C and $p = 0.006$ v group B), the incidence of MI and death did not differ significantly between groups A and C. There was no MI or cardiac death in group B. One patient in group B died of intracranial haemorrhage. Recurrent chest pain was reported by 18 (46%) patients in group B during follow up and three (7.7%) required hospital admission and repeat cardiac catheterisation.

DISCUSSION

The prevalence of CAE in the literature varies between 1.2–6%.^{1–3} The prevalence of 1.4% found in our study was low relative to that of 4.9% in the largest registry, of 20 087 patients.¹ This difference may be due to strict adherence to diagnostic criteria. Coexisting stenotic CAD was defined in 90.8% of the CASS (coronary artery surgery study) registry¹ and 84.7% in a series of patients studied by Demopoulos *et al.*² Even the combined rate of significant (59%) and non-significant CAD (17.2%), or 76.2%, in the present study was relatively low. In the study of Pinar *et al.*,⁴ CAE was found to be associated with the classic coronary risk factors except diabetes. Demopoulos *et al.*,² however, found no specific predisposing factor. The prevalence of systemic hypertension was higher in some studies.¹ Sudhir *et al.*⁵ found an increased prevalence of ectasia in familial hypercholesterolaemia but ectasia was not related to age, hypertension, smoking or ethnicity. Age seems to have no additional influence according to most investigators.^{2–5} According to our results CAE occurs predominantly in men. Hyperlipidaemia, hypertension and smoking were significant predisposing factors. In some previous studies, the RCA was reported to be the most

Abbreviations: CAD, coronary artery disease; CAE, coronary artery ectasia; CASS, coronary artery surgery study; LAD, left anterior descending artery; MI, myocardial infarction; RCA, right coronary artery

Table 1 Clinical characteristics of patients with (groups A and B) and without ectasia (group C)

	Groups A and B (n = 122)	Group C (n = 152)	p Value
Men	81 (66.3%)	93 (61.1%)	0.87
Mean age (years)	58 (SD 11)	56 (SD 11)	0.38
Hypertension	58 (47.5%)	53 (34.8%)	0.03
Diabetes	20 (16.4%)	34 (22.3%)	0.92
Smoking	51 (41.8%)	45 (29.6%)	0.03
Hyperlipidaemia	67 (54.9%)	36 (23.7%)	<0.001
Obesity	27 (22.1%)	36 (23.7%)	0.72
Positive exercise test or perfusion scan	53 (43.4%)	74 (48.7%)	0.38
Stable angina pectoris	36 (29.5%)	32 (21.0%)	0.10
Unstable angina pectoris	12 (9.8%)	18 (11.8%)	0.46
History of myocardial infarction	21 (17.2%)	28 (18.4%)	0.79
History of coronary angiography	13 (10.6%)	14 (9.2%)	0.95

commonly involved vessel, whereas others reported the LAD to be the main involved vessel.¹⁻⁴ The RCA was the most commonly involved vessel in our study, and two-vessel involvement with the RCA and circumflex artery was common in patients with isolated CAE. The cumulative rate of major adverse coronary events was significantly higher in patients with CAE with significant CAD than in patients with only significant CAD. The difference was due to a higher incidence of unstable angina pectoris, however, with no significant difference with respect to MI or cardiac death. Recurrent episodes of chest pain without associated dynamic ECG changes or enzyme rises were defined in 46% of the patients in group B. This may lead to the conclusion that patients with CAE have a relatively higher risk for angina, but the risk of MI and cardiac-related death mainly depends on coexistent obstructive CAD.

The present study has the disadvantages of retrospective studies, and we were not able to complete follow-up data adequately. Exercise testing and perfusion scans were not available for all the patients. Data on drugs received by the patients and the impact of the drugs on clinical outcomes was not available. Also, the number of patients was relatively small and a larger study is needed to reach a major conclusion.

Table 2 Follow-up characteristics

	Group A (n = 53)	Group B (n = 39)	Group C (n = 114)	p Value*
Mean follow up (months)	29 (SD 12)	32 (SD 8)	33 (SD 9)	
UA	14 (26.4%)	3 (7.7%)†	7 (6.1%)	<0.001
MI	3 (5.6%)	0	5 (4.4%)	0.72
Cardiac death	2 (3.7%)	0	4 (3.5%)	0.93
CABG	23 (41.1%)	0	36 (31.6%)	0.13
PCI	6 (11.3%)	0	58 (50.9%)	<0.001
UA, MI, cardiac death	19 (35.8%)	3 (7.7%)	16 (14.0%)	<0.001

*Group A v group C; †p=0.02 v group A.

CABG, coronary artery bypass graft; MI, myocardial infarction; PCI, percutaneous coronary intervention; UA, unstable angina pectoris.

The prevalence of CAE and its association with CAD in the present study was relatively low compared with previous studies. CAE was usually associated with CAD and prognosis seemed to depend largely on the coexistence of obstructive CAD. Isolated CAE was not an innocent condition, however, and was associated with recurrent chest pain, although the risk of MI and death was low.

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