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Original Research Paper

Study to Evaluate the Freqency of Diagonal Earlobe Crease as A Marker of Coronary Artery Disease at RIMS Ranchi

Medical Science

KEYWORDS :

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Introduction

Sanders T. Frank in 1973 had a letter published in the New England Journal of Medicine describing 20 of his patients with an earlobe crease, who were under 60 years old, chest pain and proven coronary artery disease. Frank sign is a diagonal ear lobe crease (ELC) extending diagonally from the tragus across the lobule to the rear edge of the auricle[1]. Some studies have described Frank's sign as a marker of cardiovascular disease but not linked to the severity of the condition[2].

Since than many study have been performed including autopsy based favouring association of DELC and CAD. DELC can be seen at once . There have also been reported cases of Frank's sign assisting in the diagnosis of cerebral infarctions. A link between Frank's sign and premature aging and the loss of dermal and vascular fibers has also been hypothesized[3]. Hence, the aim of the present study was to evaluate the frequency of DELC in patients with CAD .

Material and methods.

A cross-sectional study of 154 patients with CAD diagnosed by angiography was done in RIMS Ranchi, Jharkhand state,India, from january to june in year 2016 were included in the study. CAD was defined as ≥50% luminal diameter stenosis in one or more major epicardial vessel. Blood pressure was measured on 4 hourly during hospital stay and hypertension was defined as systolic blood pressure ≥140 mmHg or diastolic blood pressure ≥90 mmHg; or use of antihypertensive medications.

Obese patients or patients on treatment with lipid-lowering drugs or abnormal lipid profile were classified having hyperlipidemia, and patients with elevated serum hbA1c >6.5% or on treatment for diabetes were considered as diabetes. Body mass index (BMI) was calculated by body weight (kg)/height (m2). smokers were defined by history of smoking cigarette.

The DELC was said to be present if crease extending diagonally from the tragus across the lobule to the rear edge of the auricle without discontinuity. both unilateral and bilateral DELC were considered to be DELC positive. Patients with history of trauma or previous scar marks or piercing, or an incomplete pattern of ELC, in which a diagnosis was in dilemma,were extempted from crossectional study. DELC were examined carefully and was confirmed by palpation by examiner.

Data was entered in SPSS 16 and were analyzed using the Independent Samples T-Test and Chi-square.

Observations

154 patients were enrolled in this study. Diagonal earlobe crease (DELC) was seen in 82 patients out of 154, and the prevalence of DELC was 53.24%.

Among all patients, 52.6% of male patients and 55.0% of female patients had DELC .The mean age of CAD with DELC was 51.29+_8.16 years and CAD without DELC was 49.24+_6.8 years, no differences were observed between the two groups regarding age with p value of 0.09.

Both the male and female sex were insignificnat in both group (p value=0.471)

Prevalence of Hypertension, diabetes, and dyslipidemia were 38.3% ,33.8% and 24.0% respectively in whole group and in both the group hypertension,diabetis and dyslipidemia was insignificant(P=0.245, P=0.526, P=0.203).

There were 43 smoker (27.9%) There were significant differences between the two groups regarding smoking habit (P = 0.021.). comparing the mean of BMI between the two groups showing no significant difference (P = 0.408).

Results summarized in below table

variable	DELC absent(n=72)	DELC present(n=82)	P value
AGE	51.29+_6.808	51.29years+_8.163	0.094
MALE	54 (47.4%)	60 (52.6%)	0.471
FEMALE	18 (45.0%)	20 (55.0%)	0.471
BMI	24.541+_1.6366 kg/m2	24.791+_2.0549 kg/m2	0.408
DIABETIC	24 (46.2%)	28 (53.8%)	0.526
HYPER-TENSIVE	25(42.4%)	34 (57.6%)	0.245
DYSLIPI-DEMIA	20(54.1%)	17(45.9%)	0.203
SMOKER	14(32.6%)	29(67.4%)	0.021

Conclusion:

This study showed association of DELC with CAD.The association between diagonal earlobe creases and fatal cardiovascular disease was investigated in a consecutive series of 303 coroner's necropsies in hospital of Brighton Health District and diagonal creases were present in 123 (72%) of 171 men and 88 (67%) of 132 women.(4).Diagonal earlobe crease and coronary artery disease in a Chinese population was conducted in 449 consecutive Chinese, 250 cases with CAD and 199 without CAD in which the prevalence of DELC was 46.2% in those without CAD and 75.2% in those with CAD (P <.001) and Subjects with DELC had more stenostic vessels and higher prevalence of both any and significant coronary artery stenosis than those without DELC

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(P< .001)[5].In 1978, Kaukola, an internist at University Hospital in Helsinki, Finland reported on the correlation between DELC and coronary artery atherosclerosis where 219 patients (165 men, and 54 women, age range 32-65 years) evidenced coronary artery atherosclerosis with an acute myocardial infarction for the presence of DELC.[6].A group of physicians from Copenhagen, Denmark examined all patients (203 women, 320 men) admitted to a medical-surgical unit during a two month period of time for the presence of DELC in patients between the ages of 50 and 59 the prevalence rate (46.8%) of DELC in those with an acute myocardial infarction was significantly greater than in an age matched control group (31.6%)[7].Approximately 15 years later, again in Denmark, the Copenhagen City Heart Study, prospectively analyzed a healthy population (N = 14,223) of outpatients to determine the relationship between right-sided DELC and the development of a first acute myocardial infarction (AMI) as an indicator of coronoary artery atherosclerosis where all enrollees were followed for a 6.5 year interval and those with the DELC were noted to have a statistically significant 1.4-fold (the 95% confidence interval for relative risk was 1.1 – 1.7) increased risk of developing an AMI after controlling for age and sex[8].A Turkish study of 415 men and women (mean age 58.9 years) requiring coronary artery angiography for stable angina with a positive stress test, unstable angina, or history of prior myocardial infarct were also evaluated for bilateral DELC where the found highly significant statistically greater prevalence of DELC (51.4%) in those patients with a positive angiogram (as defined as > 70% stenosis of the luminal diameter in 1 or more of the three epicardial arteries) than in those whose angiogram was normal (15.1%) and observed sensitivity of the bilateral DELC for the diagnosis of CAD was 51%, the specificity 85%, the positive predictive value 89%, and negative predictive value 41%.[9]. In a similar Japanese angiography study two-hundred patients were divided into two groups based upon the results of imaging where one-hundred and nineteen patients had greater than 50% luminal narrowing of at least one major coronary artery and 81 had no significant atherosclerotic changes in their vessels. DELC was present in 26.1% with stenosis but in only 3.7% without stenosis and the differences between the groups were statistically significant.[10]

Raman study, the DELC was observed in nearly 60% of the urban south Indian population.[11] In Australia, Davis et al. [12] reported that the prevalence of ELC was 55% in CAD patients Rhoads and Yano[13] also found no association between ELC and CAD in JapaneseAmericans living in Hawaii.

The demographic and clinical characteristics of the 154 participants where DELC was seen in 82 patients out of 154, and the prevalence of DELC was 53.24%. Among all patients, 52.6% of male patients and 55.0% of female patients had DELC .The mean age of CAD with DELC was 51.29+_8.16 years and CAD without DELC was 49.24+_6.8 years, no differences were observed between the two groups regarding age with p value of 0.09.

However, some other studies have found no such associations and have concluded that the prevalence of ear lobe creases probably increases with age, as does heart diseases.[14,15] Davis et al. It should be noted that the different ethnic and racial backgrounds of the population used in different surveys may relevance of the conflicting results. The utility of ELC may also be lower in patients who have a higher pretest probability of CAD. This result showed in the studies showed no relation between ELC and CAD among patient with diabetis, hypertension and dyslipidemia .Limitations of the study were sample size was small , not an evaluation of ELC frequency in the non-CAD population and not grading of ear lobe crease; recent evidence has pointed out to the relationship between the increasing grades of ELC and the increasing severity of CAD and this study provide no information regarding degree of coronary stenosis with DELC. The data in this study suggest that the DELC prevalence was high in CAD patients and may be a useful sign for the presence of CAD in patients. At we propose with the help of this study that DELC as a marker of CAD and may help in early segregating at risk patient of CAD.

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