

Ear lobe crease: a cutaneous skin marker of coronary artery disease

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Abstract

In spite of advances in the diagnosis and treatment, the mortality in coronary heart disease remains high. Number of risk factors blamed for coronary heart disease are diabetes mellitus, hypertension, type A personality, raised cholesterol, family history of ischaemic heart disease, chronic alcoholism, obesity, tobacco addiction, long term use of oral contraceptive pills etc. Hence, primordial prevention is the key for controlling this deadly disease.

The present study has been attempted to evaluate skin crease over the ear lobe - as a physical marker of coronary artery disease. It is carried out at S.R.T.R. Medical college Hospital Ambajogai comprising 100 cases of coronary artery disease. The age sex and other risk factors matched to 100 control cases attending the medicine O.P.D. without having coronary artery disease. All cases were examined for ear lobe crease, characterized by deep diagonal wrinkle in lobar portion of one or both auricles extending for a distance greater than or equal to one third of ear lobe length. In study group, 72% cases had ear lobe crease while in control group 14% cases had ear lobe crease. By applying test of significance the probability was less than 0.001 i.e. highly significant. Then odd ratio was calculated and it was 15.79, suggesting that, if other risk factors are matched, person with ear lobe crease is 15.79 times at more risk to have coronary artery disease, than without.

Key words: Ear lobe crease, coronary heart disease, physical marker' or 'a cutaneous skin marker

Introduction

Skin is the icing on the anatomical cake, and without it not only would we all look rather unappealing, but a variety of unpleasant physiological phenomena would bring about our demise. Skin is thought to be the mirror of internal organs because it gives clue for internal disease and helps in early diagnosis e.g. greenish yellow discolouration of skin and itching may reflect obstructive jaundice.

In spite of advances in the diagnosis and treatment, the mortality in coronary heart disease remains high. Number of risk factors blamed for coronary heart disease are diabetes mellitus, hypertension, type A personality, raised cholesterol, family history of ischaemic heart disease, chronic alcoholism, obesity, tobacco

addiction, long term use of oral contraceptive pills etc. Hence, primordial prevention is the key for controlling this deadly disease.

All the risk factors so far identified have involved a patient's history or laboratory studies. It was only in 1973 that the first extra cardiac physical sign was reported "the diagonal ear lobe crease" as risk factor by Frank.¹ He published his observations which clarified that ear lobe crease was seen in 95% of cases of coronary artery disease. After that so many authors²⁻³ have reported the ear lobe crease as the significant risk factor for coronary heart disease. In the present study skin crease over the ear lobe is evaluated for as a physical marker or a cutaneous skin marker of coronary artery disease.

Material and methods

The study was carried out at S. R. T. R. Medical College Hospital; Ambajogai during the period March 2000 to August 2001, comprised of 100 cases of coronary artery disease with age, sex and other risk factors matched 100 controls attending

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the medicine O.P.D. without having coronary artery disease.

All patients were examined in good light for ear lobe crease. Cases having ear lobe crease characterized by diagonal deep wrinkle in the lobar portion of one or both auricles extending for a distance greater than or equal to one third of the ear lobe length in sitting position were considered to be ear lobe crease positive.

Observations and discussion

There were 100 individuals in study group and 100 individuals in control groups. Most of the individuals were in the age group of 31 - 70 years in both the groups. There were 67 males and 33 females in study group while 68 males and 32 females in control group (Table No. 1).

Table 1. Age and sex wise distribution in study group and control group

1	A	Cusp tips are mineralized but have not yet coalesced
2	B	Mineralized cusps are united so the mature coronal morphology is well defined
3	C	The crown is about half formed; the pulp chamber is evident and dentinal deposition is occurring
4	D	Crown formation is complete to the dentin-enamel junction. The pulp chamber has a trapezoidal form.
5	E	Formation of the interradicular bifurcation has begun. Root length is less than the crown length.
6	F	Root length is at least as great as crown length. Root have funnel shaped endings
7	G	Root walls are parallel, but apices remain open.
8	H	Apical ends of the roots are completely closed, and the periodontal membrane has a uniform width around the root.

Table 2. Distribution of cardiac risk factors among patients in each group

S. No	Age (years)	Sex	
		Male	Female
1	16	14	20
2	17	8	14
3	18	12	10
4	19	14	16
5	20	14	8
6	21	14	6
7	22	8	8

Table 3. Incidence of ear lobe crease in study and control groups and its significance

	Study group (n=100)	Control group (n= 200)
No. Of patients with ELC	72 (72%)	14 (14%)
No. of patients without ELC	28 (28%)	86 (86%)
Total	100 (100%)	100 (100%)

$\chi^2 = 66.28$, d.f.= 1, $p < 0.001$, significant.

Odds ratio = 15.79.

As shown in Table No.2 many of the known risk factors were equally distributed in both the groups only because of group matching of these risk factors.

In the study group, 72 patients (72%) had ear lobe crease (Fig.1 & 2) while in control group 14 patients (14%) had ear lobe crease. In the study group 28 patients (28%) did not have ear lobe crease while in the control group 86 patients (86%) did not have ear lobe crease. By applying test of significance (Chi-square test with Yate's correction) the probability was less than 0.001 i.e. highly significant (Table No. 3).

Odd ratio was calculated and it was 15.79.

In other words, if other risk factors are matched, person with ear lobe crease is 15.79 times at more risk to have coronary artery disease, than a person without ear lobe crease. The correlation between ear lobe crease and coronary artery disease may be because end arteries supply the ear lobe and heart. Another view is regarding the generalized loss of elastin and elastic fibers seen in biopsy specimen from ear lobe reflecting micro vascular disease that is also present in coronary vasculature.⁴⁻⁵

In the present study, incidence of ear lobe crease (72%) correlates with the studies of Kaukola et al 3 in which the incidence was 76.9%, Kaukola et al2 in which the incidence was 72% and Shoefeld et al4 in which incidence was 77.1%.



Figure 1. Showing ear lobe crease



Figure 2. Showing ear lobe crease

Conclusion

Incidence of ear lobe crease was 72% in study group and 14% in control group, statistically significantly associated with presence of coronary artery disease ($p < 0.001$).

Inspection of the ear lobe for skin crease can give clue to the underlying coronary artery disease. So ear lobe crease can be regarded as 'a physical marker' or 'a cutaneous skin marker' during general examination, which can forecast the disease before it, is manifested. It is for the clinician to remember that while reviewing through the risk factor, if ear lobe crease is present the risk of coronary artery disease increases even more.

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Conference Calendar

- **Medico legal Risk Management from Both Sides of the Aisle**
 - Sarasota, Florida, (Estados Unidos)
 - December 07-11, 2009
- **The International Child Neurology Congress 2010**
 - Egypt
 - February 5-5, 2010
- **13th Annual Europe Pacific Medical & Legal Conference**
 - Pocoli, (Italia)
 - January 07-14, 2010
- **Arab Health 2010**
 - Dubai, (Emiratos Arabes Unidos)
 - January 25-28, 2010
- **International Conference on Medical Negligence & Litigation in Medical Practice**
 - Tamilnadu, (India)
 - January 25-26, 2010
- **2010 Annual Meeting of The American Medical Group Association (Amga).**
 - New Orleans, (Estados Unidos)
 - February 23-28, 2010

- **ACLM 50th Annual Conference - American College of Legal Medicine**
 - Orlando, (Estados Unidos)
 - March 04-07, 2010
- **Europe Asia Medical and Legal Conference**
 - Lake Como, (Italia)
 - July 07-14, 2010
- **East West Medical and Legal Conference**
 - St. Petersburg, (Rusia)
 - July 19-26, 2010
- **3er International Bodily Injury Association Congress**
 - Madrid, (España)
 - September 20-24, 2010
- **The 20th International Symposium on the Forensic Sciences**
 - Sydney, (Australia)
 - October 05-10, 2010