

Original Article

Type A Personality & Coronary Artery Disease: A Case Control Study

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ABSTRACT

Background and objective: Cardiovascular diseases are becoming the major cause of morbidity and mortality in most of the developing countries including India. Various studies proposed that type A personality is an independent risk factor for coronary artery disease. Present study was carried out to study the role of type A personality in the occurrence of coronary artery disease.

Materials and Methods: Present study was a hospital based paired matched case-control study, carried out at civil hospital, Ahmedabad. 135 newly diagnosed cases of coronary artery disease and 135 controls were studied after taking informed written consent. Data was analysed by using Epi-info version 3.5.1 computer package, Chi - square test, and Odds ratio were calculated.

Results: Among the total 135 cases 70.4% were male and 29.6% were female, most of the cases (40%) were belongs to the age group of 51-60 years. In our study significantly higher number of the cases (28.9%) having Type A personality as compared to controls (12.6%), and this difference was statistically significant ($X^2= 10.90$, $P < 0.001$).

Conclusion: findings of our study suggest that type A personality is major etiology behind the occurrence of coronary artery disease. Awareness should be created among the people regarding type A behavior and also promote various stress management techniques like breathing exercises, stretching exercises, yoga, meditation which are quite helpful in reducing the risk of CAD.

Key words: Case control study, Coronary artery disease, Type A personality

INTRODUCTION

The global burden of cardiovascular diseases (CVD) is rapidly increasing, predominantly due to a sharp rise in the incidence and prevalence of the same in the developing countries. India, a developing nation, is undergoing the same phase and is now in the middle of a coronary artery disease (CAD) epidemic [1]. In India, Overall prevalence has increased from 2.06% in 1970 to 5% in 2002 in rural area and 1.04% in early 1960 to 13.02% in 2004 in urban area.² Moreover; the age of onset for CVD is almost a decade earlier in India than the most developed countries. About 52% of deaths from such disorders in India occur before 70 years of age, compared with 23% in developed countries [2, 3]. Hence the magnitude of economic losses owing to loss of productive years of life in India is likely to be higher than much of developed countries.

Coronary artery disease is a multifactorial disease. In 1974, Meyer Friedman and Ray Rosenman proposed that type A personality was an

Independent risk factor for CAD [4]. Type A personality associated with competitive drive, restlessness, sense of urgency or impatience, aggressiveness and hyper alertness while type B personality is characterized by relaxed, easy-going, works steadily, not easily irritated, seldom short of time, moves and speaks more slowly. In type AB personality individual have some of the different characteristics of both type A and type B personality. Type A personality persons more vulnerable to heart disease than type B personality persons, because they have a substantially greater sympathetic nervous system response to stressful or demanding circumstances- more stress hormones, a faster heart rate and high blood pressure, producing more wear and tear on the cardiovascular system [5].

Interestingly, the vast majority of studies of type A personality have been carried out in western countries, very few studies have been conducted in India and literature investigating this relationship is limited in India. Therefore, a hospital-based case

control study was conducted to assess the relationship of type A personality with CAD.

MATERIAL AND METHODS

A paired matched case-control study, carried out at civil hospital Ahmedabad, a tertiary care teaching hospital, for one year from March 2009 to April 2010. Permission was taken from the Ethical Committee, of the institute before carrying out the study. Informed written consent was taken from all the enrolled subjects after a full explanation of the purpose of study and liberty to drop out. This was done in Gujarati, Hindi and English languages for easy comprehension. All the patients were interviewed and examined while in hospital, all the information was filled up in a specially designed pretested questioner.

Sample size:

This section is a part of study in which we studied all the risk factors of CAD, sample size of the study was calculated after conducting the pilot study, by using the following formula [6].

$$N = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 p q (r + 1)}{(P_1 - P_2)^2 r}$$

Where,

$\alpha = 0.05$ (allowed type I error), $\beta = 0.02$ (allowed type II error). So for these value of type I & type II errors the values of power of detecting these errors are as under;

$$Z_{1-\alpha/2} = 1.96 \text{ and } Z_{1-\beta} = 0.84$$

$P_1 = 0.55$ proportion of smokers among the cases in pilot study and $P_2 = 0.38$ proportion of smokers among the controls in pilot study

$$p = (P_1 + P_2)/2 = 0.465, q = 1 - p = 0.535$$

$r =$ ratio of number of controls to cases, here it was 1.

Putting all these values to the above mentioned equation the desired sample size was found to be

$134.97 \approx 135$. As the case: control ratio was kept 1: 1, the final total sample size of study was 270 (135 cases and 135 controls).

SELECTION OF CASES

Definition of Case: Newly diagnosed CAD patients as per the Monica criteria: (1) two or more ECG showing specific changes; (2) an ECG showing probable changes plus abnormal cardiac injury enzymes; or (3) typical symptoms such as a retrosternal pain plus abnormal enzymes.⁶ were included in the study.

Eligibility criteria for cases: The patient who was diagnosed first time as a suffering from CAD to avoid bias arising from recall memory. Well conscious, co-operative, and well oriented with

time, place and person, to avoid bias from respondent's answers.

SELECTION OF CONTROL

Definition of control: A control was defined as an individual who was admitted in civil hospital Ahmedabad on the same day or within seven days for conditions other than angina pectoris and myocardial infarction. For the selection of proper control person's prior history regarding CAD was asked and it was assured that the control had never been admitted to hospital or taken treatment for acute myocardial infarction and angina pectoris.

Eligibility criteria for control: Well conscious, co-operative, and well oriented with time, place and person, who voluntary agree to participate in the study to avoid bias from respondent's answers.

Matching:

For each case one age and sex matched control was selected, age matching was done with the liability of ± 2 years of age.

Type A personality was assessed using Glazer stress control lifestyle questionnaire[7], which was translated into the local language (Gujarati) for better understanding, it comprising 20 items, each individual item was scored with a minimum score of 1 to maximum score of 7, score was given for each item according to the answer as well as by evaluating the style of response of the subjects, scores of all the items were summed for classification of personality pattern.

Socio-economic classes were define according to modified Prasad's classification with Consumer Price Index of mid-study period (530) [8]. Accordingly, the following classification was used [Table 1].

RESULTS

A total of 135 cases of coronary artery disease and 135 matched controls were analysed. Among the cases, 70.4% were males and 29.6% were females. The Largest numbers of cases were in the age group of 51-60 years (40%). The mean age of cases and controls were 54 ± 10.50 years and 53.83 ± 10.66 years respectively, and this difference was not statistically significant ($Z = 0.13$, $P > 0.05$) [Table 2].

Study of Socio-demographic characteristics revealed that predominance of Hindus in both cases and controls. Family characteristics did not reveal any significant difference between cases and controls. Majority of the cases 45.9% were from

urban area while controls were equally distributed in urban, urban slum, and rural area, and this difference was statistically significant ($X^2= 8.99, P < 0.01$).

Table 1: Socio- Economic Classification

SE Class	Modified Prasad's classification
Class I	2600 and above
Class II	1300 to 2599
Class III	780 to 1299
Class IV	390 to 779
Class V	below 390

Table 2: Age and Sex wise distribution of Cases and Controls

Age group (in years)	Cases			Controls		
	Male	Female	Total	Male	Female	Total
31 – 40	11 (11.6)	4 (10) (22.5)	15 (11.1)	9 (9.5)	5 (12.5)	14 (10.4)
41 – 50	28 (29.5)	9 (22.5)	37 (27.4)	30 (31.6)	9 (22.5)	39 (28.9)
51 – 60	39 (41.1)	15 (37.5)	54 (40.0)	38 (40.0)	14 (35.0)	52 (38.5)
61 – 70	12 (12.6)	10 (25)	22 (16.3)	13 (13.7)	8 (20.0)	21 (15.6)
71 – 80	4 (4.1)	2 (5)	6 (4.4)	3 (3.1)	4 (10.0)	7 (5.2)
>80	1 (1.1)	0 (0)	1 (0.7)	2 (2.1)	0 (0)	2 (1.5)
Total	95 (70.4)	40 (29.6)	135 (100)	95 (70.4)	40 (29.6)	135 (100)

(Figures in parentheses showing percentage)

Distribution as per social class stated that middle socio economic class was predominant (91.9%) among the cases, while only 8.1% of cases were from socio economic class I, and similar distribution was also observed among the controls. This is because most of the patients come to the civil hospital, Ahmedabad were belongs to the lower or middle socio economic class. Overall literacy rate of cases and controls was 75.5% & 66.7% respectively [Table 3].

Majority of men in cases (48.41%) were engaged in either some sort of service or business while majority of men in controls (51.6%) were working as a labourer or farmer. Most of females in both cases & controls (80% & 62.5% respectively) were engaged in household work.

In our study significantly higher number of the cases (28.9%) having Type A personality as compared to controls (12.6%), and this difference was statistically significant (Z value=3.37, P<0.05), Odds ratio of Type A personality and CAD is 2.82 which means individual having Type A personality have

Table 3: Socio demographic characteristic of cases and controls

Variable	Cases (N = 135)		Controls (N = 135)	
	No.	%	No.	%
Marital Status				
Married	130	96.3	123	91.1
Widowed	4	3	12	8.9
Single	1	0.7	0	0
Religion				
Hindu	111	82.3	116	85.9
Muslim	23	17	17	12.6
Christian	1	0.7	2	1.5
Residence				
Urban	62	45.9	49	36.2
Urban slum	51	37.8	43	31.9
Rural	22	16.3	43	31.9
SE Class				
Class I	11	8.1	12	8.9
Class II	41	30.4	40	29.6
Class III	41	30.4	43	31.9
Class IV	42	31.1	38	28.1
Class V	0	0	2	1.5

2.82 times more risk of developing CAD as compared to individual having Type B or Type AB personality.

DISCUSSION

The present study was designed as hospital-based case-control study to assess the relationship of type A personality with CAD. A total of 270 subjects (135 cases and 135 controls) were studied. Among the total 135 cases, 70.4% were males and 29.6% were females, male predominance has been also reported by Zodpay et al [9]. Singh RB et al also observed that prevalence of CAD was significantly (P<0.001) higher in men as compared to women in both urban (11% vs. 6.9%) & rural (3.9% vs. 2.6%) areas respectively [10].

The mean age of cases was 54 ± 10.50 years, largest number of cases were present in the age group of 51-60 years (40%), followed by 41-50 years (27.4%), whereas 11.1% of the cases had faced their first attack of CAD before crossing the forty of their life, which is well correlated with the findings of Zodpay et al [9]. Significantly higher numbers of cases were belongs to urban area as compared to rural area, similar urban rural difference was also observed by Singh R.B. et al [10]. High prevalence of CAD among urban dwellers might be due to accumulation of various risk factors.

There has been a great deal of controversy over the association of type A personality and coronary

artery disease. In fact several studies like Multiple Risk Factor Intervention trial [11] and Multicentre Post infarction Program [12] reported negative findings on the subjects. However, several studies

proves that individuals having type A personality are more prone to CAD than type B personality individuals [13, 14].

Table 4: Distribution of cases and controls according to their type of personality

Type of behaviour	Cases	controls	OR	CI	Z	P
Type A	39 (28.9)	17 (12.6)				
Type AB*	93 (68.9)	105 (77.8)	2.82	1.44 – 5.56	3.37	< 0.05
Type B*	3 (2.2)	13 (9.6)				
Total	135 (100)	135 (100)				

In our study significant association was also observed between type A personality pattern and CAD (OR=2.82), which is well correlated with the findings of Framingham study [15].

CONCLUSION AND RECOMMENDATIONS

To conclude, findings of our study suggest that type A personality is major etiology behind the occurrence of coronary artery disease. Awareness should be created among the people regarding type A behavior and, also promote various stress management techniques like breathing exercises, stretching exercises, yoga, meditation which are quite helpful in reducing the risk of CAD.

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