Epidemiology of Heart Disease in Diabetes

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Factors which determine the prevalence of heart disease and its manifestations amongst diabetics in a population are as follows:-

1. Prevalence of diabetes in the population in general (non-diabetics).
2. Profile of population under study
   a. Age and sex distribution
   b. Body physique
   c. Life span
3. Associated risk factors
   a. Lipids
   b. Smoking
   c. Hypertension
   d. Life style
4. Prognostic features of heart disease
5. Health care facilities

Prevalence of cardiovascular disease implying coronary artery disease (CAD) amongst the general population (non-diabetics) in India is relatively low (3/1000) as compared to the Western Countries (9/1000) [1].

This low prevalence however, is not reflected amongst the diabetic population as has been shown by the WHO Multinational study on vascular disease amongst the diabetics.

ECG changes of probable type are observed in 3.6 percent and ECG changes of possible type in 18.4 percent [2].

These figures are comparable to the prevalence data for (CAD) in the European Countries. Of those at risk for diabetes, i.e. with IGT, followed for three years in a semi-urban population near Delhi, CAD was observed in 4.6% (though at the initial screening CAD was present in 1.8%) [3].

The population profile of India indicates that about 40% are below 15 years in age. Thus the vulnerable age group for CAD is proportionately less resulting in the total load of CAD being relatively smaller.

In India, male to female ratio is 1:0.9. Since CAD occurs predominantly in males, this difference in sexes leads to a proportionate excess amongst the male. Surprisingly possible changes of CAD in the ECG are observed more often amongst females.

Of those screened with possible changes of CAD as evident in ECG only one third demonstrated a positive ECG stress test reflecting the underlying CAD. [4]

There is no obvious cause identifiable for the ECG abnormalities in the remaining two third patients as yet.

There is sufficient data available to indicate that ventricular dysfunction occurs early in diabetes which limits the VO_2 max on exercise [5]. The life span in India is about two decades less than that found in the developed countries. This implies that diabetics with a long duration of the disease are very few and probably most succumb to other non-cardiac causes.

In India the proportionate population which is overweight is less, since the mean weight of the population is 55 kg with a height of 165 cms in males and 50 kg with a height of 155 cms in female. Amongst NIDDM only one third are overweight. [6]

Though the consumption of animal fat may be less in India. Milk, milk products, hydrogenated vegetable oils for cooking contribute to the extent of 40% of total fat consumption. In the general population the mean cholesterol value was 206 ± 30 mg% and the serum triglycerides 150 ± 20 mg%. However amongst the diabetics 30% or more were found to have hypercholesterolemia or hypertriglyceridaemia.

Smoking was observed in 40% of the male diabetics and 2% of female diabetics. Other risk factors concerning life style were not easy to discern since the data was based on questionnaires and not on any objective parameters.

It has been stated that prognostically the Asian Indians with diabetes and heart disease have a bad outlook; the immediate mortality is high and the complications are more frequent and often grave [7]. This fact is not borne out by the studies in India. The immediate mortality following a acute myocardial infarction is 21.6% (11.5% in non-diabetics) as observed amongst any other population. It needs to be emphasized that those with poor control of diabetes, e.g. HbA_1C above 12 percent often did badly as compared to other groups (mortality being 3.3 times higher) [8]. There is a cultural bias in that our population does not utilize the health care facilities as often as the standard treatment regime would require. More often it is delayed till the disease reaches a stage wherein hospitalization becomes a dire necessity.

There is also a lack of public awareness on the requirements of compliance to treatment and of follow-up measures. Failure to do so adds to the excessive wastage of lives during recurrences or complications of CAD.

Diabetes could lead to asymptomatic coronary artery disease, hence as a preventive measure it necessary for all diabetics above the age of 40 years to undergo stress ECG. It needs to be reinforced that an assessment of risk factors and their management like the control of body weight, lipids, blood pressure and smoking is more significant than mere control of blood glucose in such a situation.

The main points of this presentation are as follows:

The protection i.e. low prevalence of CAD that certain population have, does not apply to its diabetic subsets.

Even in the absence of well established risk factors of coronary artery disease, diabetes by itself is a significant contributor to this disease.

Prognostically the control of diabetes relates to the outcome of CAD i.e. immediate mortality or the grave complications that follow.

REFERENCES

1. Reddy KS. Cardiovascular Disease in India. Key note paper presented at WHO workshop on Preventive Cardiology, New Delhi, October 1992.

2. Diabetes Drafting Group of the WHO. MNSVD in Diabetes. Prevalence of small vessel and large vessel disease in Diabetes patients from 14 centers. Diabetologia 1985; 28 : 615-40.

3. Bhatnagar Ashok, Ahuja MMS, Wasir HS. Correlative factors for cardiovascular disease and Glucose intolerance in a semi-urban population in North India. ICMR Report 1985-86.

4. Ahuja MMS, Moolchandani J. Stress ECG in coronary possible cases (Minnasotta Code) in Diabetes Mellitus. ICMR Research Fellowship, 1983.

5. Mildenberger RR, Bar-Shlomo B, Druck MN et al. Clinically unrecognized ventricular dysfunction in young diabetic patients. J. Am. Coll. Cardiol 1984; 4 : 234-8.

6. Ahuja MMS, Kapoor SK, Menon N, Malhotra SL, Kumar V. A study of factors in relation to vascular disease in Diabetes in North India. Indian Journal of Medical Research 1976; 64 : 1352.

7. McKeigue PM, Miller GJ, Marrot MG. Coronary Heart Disease in South Asian Overseas – A review. J. Clin. Epidemiology, 1989; 42 : 597-609.

8. Kumar Surender, Ahuja MMS. Correlation of glycated hemoglobin with outcome of acute myocardial infarction in Diabetes. Diabetes 1991; 40 : 475.