ABSTRACT

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Chronic degenerative diseases such as obesity, diabetes, hypertension and chronic heart disease that are said to be diseases of civilization are fast emerging to be a burden for many of the developing countries. The increasing prevalence of chronic degenerative diseases portrays that the morbidity of these is on the rise, thus laying emphasis to study the risk factors associated with the same The present study was thus planned with an objective to map the prevalence and to study the risk factors for the development of chronic degenerative diseases in an industrial set-up in Vadodara.

Of the 1025 subjects enrolled from the Indian Oil Corporation (Gujarat Refinery), Vadodara, 63 1% were males and 36.9% were females. The average age of the subjects was found to be 42 years The average Body Mass Index (BMI) was found to be 24 7 for both the sexes The educational profile of the subjects revealed 29% of the subjects to be diploma holders or graduates. Majority of the subjects (78.6%) had per capita income greater than 1000, indicating that they were above the economically disadvantaged category.

The average nutritive value of the snack packets provided by the canteen was 291 Kcal, and the protein, fat and carbohydrate content was found to be 8 3g, 23 2g and 18.4g respectively, implying that they were rich sources of calories and fat. Furthermore, the data revealed that the average monthly sale of

snack packets irrespective of the food items was found to be very high, indicating the increased consumption of energy dense snacks from the canteen This is also evident from the dietary analysis, which reveals the fat energy ratio of the subjects to be greater than 30%.

In the present study the prevalence of chronic degenerative diseases such as overweight, obesity, diabetes, hypertension and chronic heart disease was found to be 33%, 8%, 8%, 6% and 1% respectively

The assessment of lipid levels of male and female subjects showed that the males had significantly raised levels of TC ($p<0.001$), TG ($p<0.001$), VLDL-C ($p<0.001$), Non HDL-C ($p<0.001$) and TC/H ($p<0.01$) ratio respectively The impact of age on the lipid parameters of the subjects showed that those who were above the age of 40 years had significantly higher ($p<0.001$) levels of TC, TG, LDL-C, VLDL-C and Non HDL-C in comparison to those below the age of 40 years.

The influence of general habits of subjects such as smoking or chewing tobacco, and alcohol consumption increases the chances of giving rise to complications. In the present study the relative risk of diseased subjects to develop complications with respect to smoking, tobacco chewing and alcohol consumption was found to be 1 6, 1 3 and 1 4 respectively. These results thus indicate that the general habits of the subjects such as smoking, tobacco chewing and consumption of alcohol do play a role in worsening the metabolic profile of the subjects

Among the various etiological factors, elevated levels of the circulating lipids are of great importance The comparison of lipid levels among the normal and diseased subjects showed atherogenic dyslipidemia to be present in subjects suffering from various chronic degenerative diseases such as overweight or obesity, diabetes, hypertension and chronic heart disease respectively

Obesity as mentioned earlier is associated with detrimental changes in the lipid profile In the present study significant rise in the atherogenic lipid levels was noticed with an increase in the body mass index of the subjects who were not suffering from any other chronic degenerative disease. This once again emphasizes the fact that overweight and obesity do carry a penalty for the occurance of atherogenic dyslipidemia, which in turn is a risk factor for other chronic degenerative diseases

It is not only the amount of weight that one is carrying that is important, but the pattern of fat distribution is also important Abdominal or android fat distribution in the central or upper body - has been found to be more risky for health than gluteal femoral or lower body or gynoid obesity The correlation coefficient 'r' was 0.88 and 0 77 among male and female subjects when body mass index and waist circumference were compared, whereas the correlation coefficient 'r' was 0 4 and 0.02 among the male and female subjects when body mass index and waist hip ratio were taken into account Thus emphasizing that body mass index and waist circumference are good indicators of body fat rather than using body mass index and waist hip ratio.

In addition to the comparison of lipid profile between various groups with respect to their disease profile, the analysis of relative risk of the subjects (Normals Vs Diseased) in relation to the lipid profile was also done so as to study the risk of various atherogenic lipid parameters It was observed that among the overweight, obese, hypertensive and CHD subjects,TC was found to be the highly dependable risk factor in comparison to other lipid parameters whereas, among the diabetics TG (RR=4 4) was the more dependable risk factor followed by TC, LDL-C and Non HDL-C respectively

The ratios of Apo A1 / Apo B showed a decreasing trend among the dyslipidemic, overweight & obese, diabetic and hypertensive subjects thus indicating their being at a greater risk of developing cardiovascular disease as the ratio is considered to be a sensitive index for predicting the risk

The evidence that antioxidants may play a role in the prevalence of atherogeneis has been increasing rapidly in recent years In the present study the total antioxidant activity of the normal subjects (1 81 ± 0 20 μmoles/l) was significantly higher than the overweight or obese (1 65 ± 0 17μmoles/l), diabetic (1 63 ± 0.15μmoles/l) and hypertensive (1 64 ± 0 17μmoles/l) subjects These results strengthen the fact that low levels of antioxidants may play a role in the development of ischemic heart disease

Thus, from the results of the present study it can be summarized and concluded that the energy dense foods provided by the industrial canteens at

highly subsidized rates would have been the plausible cause of increased prevalence of obesity along with sedentary lifestyle in this study population Moreover, the general habits of the people such as cigarette smoking, tobacco chewing and alcohol consumption do have a role to play in worsening the metabolic profile of the individuals The study also portrays atherogenic dyslipidemia to be the hallmark of all these chronic degenerative diseases Furthermore, the apolipoproteins and the total antioxidant activity which showed an adverse trend in the subjects suffering from various chronic degenerative diseases suggests their use as an additional tool for mapping the risk of cardiovascular disease Lastly, the study also shows that as one moves from a lower to higher body mass index, the risk of suffering from various chronic degenerative diseases increase and that obesity is emerging as the root cause of all the complications, thus it is aptly said that obesity is the mother of chronic degenerative diseases