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Cardiac Risk Factor Analysis in East Azerbaijan, Iran

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Abstract: Cardiovascular diseases and cancer account for 58.9% of all deaths respectively in East Azerbaijan in 2003. Our aim of this study as part of a national program was to determine the status of major risk factors of non communicable diseases in Eastern Azarbaijan province north west of Iran. A cross sectional survey was conducted on 3740 men and women between 15-64 years old. The study was designed based on WHO STEPS approach. One stage cluster sampling method was used. Data were analyzed using Statistical Package for Social Science (SPSS) version 11. Proportions and means were calculated along with 95% confidence intervals. Proportions were compared between subgroups using chi-square test and means were compared using t test. Cigarette smoking was observed in 14.9% of population (95% CI: 13.75-16.04). Nearly half of the participants consumed fruit and vegetables more than four time a week. 70.3 % of individuals didn't use fish in a given week period. The highest overweight rate was 41.87% found in 55-64 years age group and the highest obesity rate was 22.65% found among 45-54 years old individuals. 71.1% of men and 80.1% of women didn't do at least 10 min of exercise in leisure time. About 9% of men and 12.8% of women were hyper cholesterolemic ($p<0.001$). Mean fasting blood sugar was 93. mg dL^{-1} for men and 93.85 mg dL^{-1} for women. A history of blood pressure measurement was observed among 38.8 % of individuals. 19.4% of men and 21.9% of women had raised blood pressure. The primary goal of NCD prevention programs can be to decrease obesity mainly through propagating exercise and supplying prerequisites of it. People with risk factors need to be identified, made aware of the situation and provided with tools to make changes in their behaviors.

Key words: Non communicable diseases, risk factors, WHO STEPS, prevention programs, SPSS

INTRODUCTION

The change in the economic, social and demographic determinants of health and adoption of unhealthy lifestyles are contributing to observed conversion in the disease pattern characterized by an accelerate rise in morbidity and mortality due to Non Communicable Diseases (NCDs). NCDs are considered as a rapidly growing problem in developing countries (Pekka, 2002). Demographic projects suggest a major increase in NCD mortality over the next two decades in these countries (Muligan *et al*., 2006). The world Health Report 2004 had indicated that NCDs account for almost 60% of deaths and 47% of the global burden of diseases. Seventy-five percent of the total deaths due to NCDs occur in developing countries. NCDs linked to a cluster of major risk factors such as tobacco use, unhealthy diets, physical inactivity, obesity, high blood pressure, cholesterol and glucose levels that are measurable and largely modifiable. The majority of NCDs are preventable in 2007. The increase in NCD ssignificantly increases the costs of illness and burden on the health care system. The major causes of morbidity and mortality shift from the communicable disease, to the non-communicable ones (Susan, 2001). The increasing proportion of the population aged 60 years or more and the accompanying growing prevalence of NCDs are important health issues in Iran. There are significant changes in diet and activity patterns, these are in turn important elements in the epidemiological transition i.e., the shift from communicable to NCDs. Primary prevention of occurrence of risk factors along with their early identification and management can help delay the progress towards NCDs (Mehan *et al*., 2006). WHO report 2002, identifies 5 important risk factors for non communicable diseases in the top 10 leading risks to health. These are raised blood pressure, raised cholesterol, tobacco use, alcohol consumption and overweight (Surveillance Non Communicable disease, 2003). Cardiovascular diseases and cancer account for 58.9% of all deaths respectively in East Azerbaijan in 2003 (Naghavi, 2004). WHO's STEPS methodology, provides a framework for the surveillance

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of risk factors of NCDs. Settings approach has been recommended as a strategy by WHO, for targeting large groups of population at a time (Mehan *et al.*, 2006). Our aim of this study as part of a national program was to determine the status of major risk factors of non communicable diseases in Eastern Azarbaijan province north west of Iran.

MATERIALS AND METHODS

This research was carried out in 2004 in East Azerbaijan province. East Azerbaijan province is located in north-west of Iran with a population equal to 3500000 people. A cross sectional survey was conducted on 3740 men and women between 15-64 years old. The study was designed based on WHO STEPS approach. WHO STEPS approach uses different levels of risk factor assessment including data collection using questionnaires (step 1), physical measurements (step 2) and taking blood samples for biochemical assessment (step 3).

One stage cluster sampling method was used. To decrease intra-cluster correlation coefficient WHO has suggested at least 250 participants from each sex to be sampled in each age group. In our study we selected 188 clusters and 20 people were chosen in each cluster. Only one cluster was omitted due to difficulties in traveling to the village. Study participants were selected in 5 age subgroups.

The main items included in step 1 were socioeconomic and demographic variables like Age, Sex, education level, tobacco use, physical inactivity, fruit and vegetable consumption, occupation, ethnicity, types of physical activity, history of hypertension or diabetes, treatment history for diabetes and hypertension.

The main items included in step 2 were measured weight, height, blood pressure, pulse rate and waist circumference. At analysis a systolic blood pressure above 140 mmHg or diastolic blood pressure above 90 mmHg was considered as high blood pressure. Height was measured by a portable stadiometer following standard procedure. All the volunteers were weighed without shoes, in single layer of indoor clothing. The Body Mass Index (BMI) was calculated from recorded measurements. Compatible with WHO criteria overweight was defined as BMI greater than or equal to 25 kg m^{-2} and obesity as BMIgreater than or equal to 30 kg m^{-2}.

The main items included in step 3 were measured Fasting blood sugar (Glucose) and total cholesterol. At analysis a cholesterol level above 240 mg dL^{-1} was considered as hypercholesterolemia. We also classified FBS into 3 groups as = 110, 111-125 and >125 mg dL^{-1}.

Data were collected through an adopted questionnaire from the original WHO STEPS study questionnaire. This questionnaire was filled out by trained interviewers selected out of the staff working in Tabriz university of medical sciences.

Data were analyzed using Statistical Package for Social Science (SPSS) version 11. Proportions and means were calculated along with 95% confidence intervals. Proportions were compared between subgroups using chi-square test and means were compared using t test.

RESULTS

Demographic: Rural inhabitants constituted 33.23% (1243) of the participants compared to 66.2.% (2497) who were urban inhabitants. Age and sex distribution of study sample is provided in Table 1. 17.23% of individuals were illiterate, 15.59% had primary school education, 23.98% secondary school education, 21.44 of them had either high school diploma or college certification and 9.54% had academic education.

According to the occupational status, 6.55% of cases were civil servants 11.25% were workers or farmers and 37.84% were housewives. Students constituted 16.68% of cases.

Smoking: Cigarette smoking was observed in 14.9% of population (95% CI: 13.75-16.04). Current daily smokers were 13.4% (95% CI: 12.30-14.49).

Table1: Age and sex distribution of study participants

Total number	Female (%)	Female Number	Male (%)	Male Number	Age group
709	51.63	366	48.37	343	15-24
763	49.62	379	50.32	384	25-34
738	49.91	361	51.08	377	35-44
781	49.9	389	50.19	392	45-54
749	49.26	369	50.73	380	55-64
3740	49.83	1864	50.16	1876	Total

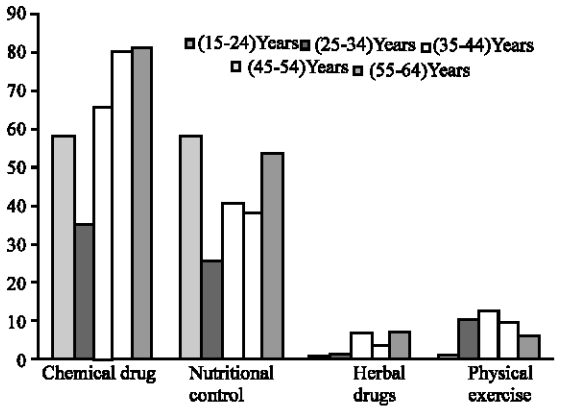

Fig. 1: Distribution of different methods of hypertension treatment used at given age groups

Table 2: Distribution of some risk factors in males and females and different age groups

	Female						Male					
NCDs risk factors	Total (weighted)	55-64 Years	45-54 Years	35-44 Years	25-34 Years	15-24 Years	Total (weighted)	55-64 Years	45-54 Years	35-44 Years	25-34 Years	15-24 Years
Prevalence of high blood pressure (= 140/90)	22.35	60.43	50.64	29.09	15.04	7.92	21.34	51.31	41.32	25.21	15.36	11.37
Prevalence ofobesity	17.29	23.82	31.88	27.50	19.05	5.77	8.79	17.51	13.40	12.10	8.95	4.09
Prevalence of individuals that haven't exercise	9.27	4.44	8.11	17.46	11.11	5.61	14.19	14.29	12.2	17.82	12.8	13.97
Prevalence of daily cigarette smokers	1.11	3.80	1.50	1.90	0.8	0.3	20.26	29.2	32.7	31.8	22.4	8.2
Prevelence oh high blood cholesterole (>240 mg dL^{-1})	13.26	28.08	19.19	12.61	6.42		10.95	11.41	12.7	13.61	8	
Prevalence of high fasting blood sugar (>125 mg dL^{-1})	4.64	12.14	11.08	2.93	0.56		5.52	9.51	4.30	6.65	4	

Fruit and vegetable consumption: Only 5% didn't consume fruit and vegetables at least one time a week. Nearly half of the participants consumed fruit and vegetables more than four time a week.

Fish meat consumption: 70.3% of individuals didn't use fish in a given week period and only 2.6% consumed fish more than three times a week.

Weight and height: The mean BMI in individuals was 25.48 (25.28-25.68) in men and 27.49 (27.25-27.75) in women. Difference between two values was found to be statistically significant ($p<0.000$).The prevalence of overweight and obesity by WHO criteria in men was 49.4% (47.79-51.00%) and 13.6% (95% CI: 12.4-15.6%), respectively. This figures for women were 64.3% (95% CI: 62.74-65.71%) and 29.3% (95% CI: 25.7-28.5%), respectively.The highest overweight rate was 41.87% found in 55-64 years age group and the highest obesity rate was 22.65% found among 45-54 years old individuals.

Physical activity: 71.1% (69.64-72.55%) of men and 80.1% (78.8-81.3%) of women didn't do at least 10 min of exercise in leisure time ($p<0.000$) and 23.2% (21.96-24.67%) ofthem had no physical activity in their work.

Total serum cholesterol: About 9% of men (95% CI: 8.08-9.91%) and 12.8% (95% CI: 11.72-13.87%) of women were hypercholesterolemic ($p<0.001$). Mean cholesterol levels were 190. 60 (95% CI: 188.4-192.8) mg dL^{-1} for men and 199.17 (95% CI: 197.3-201.57) mg dL^{-1} for women ($p<0.001$).

Fasting blood glucose: Mean fasting blood sugar was 93.52 (95% CI: 91.5-95.54) mg dL^{-1} for men and 93.85 (95% CI: 92.17-95.53) mg dL^{-1} for women without a statistically significant difference.

Blood pressure: A history of blood pressure measurement was observed among 38.8 % of individuals and the highest figure was 64.3 belonging to 55-64 years age group. A positive history of hypertension as declared by the patients was 6.56 ranging from 3.7 in male to 9.45 among females. Distribution of different methods of treatment at given age groups is presented in Fig. 1. 19.4% of men (95% CI: 18.2-20.74%) and 21.9% (95% CI: 20.66-22.31%) of women had raised blood pressure.

Further detail of risk factors for two sexes and different age groups is given in Table 2.

DISCUSSION

Currently only few studies have been conducted in Iran that evaluated NCDs risk factors. In a study carried out earlier in 2000 in Zanjan providence, current daily smokers constituted 10.6% of adults above15 years of age (WHO, 2003). The smoking rate in our study did not show any significant rise compared to 2000. The smoking rate in Iran is lower than Turkey that is Iran's neighbor and has a population approximately equal to Iran. In Turkey 50.9% of men and 10.9% of women were daily smokers (1997-1998). The BMI = 30 kg m^{-2} has been suggested to determine risk for WHO (2002). We see that the percentage of obesity in both men and women is lower than those reported for the former in Tehran study performed in 1999-2000 (13.6 vs. 33% for males and 29.3 vs. 67.2% for females) (WHO, 2003). Our study results show that the rate of over weight in our men and women are higher. Study in urban and rural populations in Turkey showed that the mean of BMI in men and women were approximately equal to our study (25.5 for men and 27.5 for women). About 75% of our population didn't have any physical activity in leisure time. In Isfahan survey carried out in 1994, in urban areas 45.9% of males and 60.3% of females lacked physical activityin leisure time,

Our data therefore confirms the existence of sedentary lifestyle dillema. The major published study on cholesterol level is Tehran survey in 1999 that 19.3% of men and 23.7% of women had a cholesterol level above 240 mg dL^{-1}. Compared to Tehran surveyour population had a better situation. But in Turkey only 10% of men and 6% of women had cholesterole = 240 mg dL^{-1} and thus Turkey owned a better condition, in addition contrary to Iranian studies, the cholesterol level in Turk women is less than men. The fasting blood glucose value in a urban survey performed in Abhar, showed that Eastern Azerbaijan population had higher glucose values (93.53 vs. 83 mg dL^{-1} for males and 93.85 vs. 83.3 for females). In Tehran study (1999-2000) 16.9% of men had systole blood pressure above 140 or diastole blood pressure above 90. This figure was less than ours but 14.7% women had raised blood pressure which is significantly less than our survey. Raised blood pressure ina big study in rural Turkey carried out during 1990-1993 at several districts showed that16.7% of men and 26% of women had raised blood pressure. So it seems that Turk womenmore than Iranian woman had raised blood pressure, while the male picture was inverse.

CONCLUSION

This s tudy can be as a starting point for tackling the problem of non communicable diseases. Prevention programs should be designed and implemented based on data coming from this study. The primary goal of such programs can be to decrease obesity mainly through propagating exercise and supplying prerequisites of it. People with risk factors need to be identified, made aware of the situation and provided with tools to make changes in their behaviors. Interventions to reduce risk factors could include educational and training programs for increasing professional and public awareness of NCDs and how to reduce them.

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