ORIGINAL ARTICLE

GENDER DIFFERENCES IN CORONARY RISK FACTORS AMONGST HYPERTENSIVE PATIENTS FROM BAGH, AZAD KASHMIR

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ABSTRACT

Background: With ever-changing lifestyles in the developing countries prevalence of coronary heart disease is on the increase. This study was conducted to determine differences in frequencies of different risk factors between hypertensive male and female patients.

Material & Methods: This cross-sectional study enrolled hypertensive patients of either gender older than 30 years. Unwilling patients, those on lipid lowering drugs, those with secondary hypertension and patients not yet started on antihypertensive drugs were excluded. Different risk factors assessed included diabetes, physical inactivity, alcohol consumption, family history of premature coronary heart disease in first degree relatives and smoking. BMI was also calculated. Plasma glucose fasting, serum total cholesterol, serum triglycerides, spot urinary albumin creatinine ratio were measured. Ultrasound abdomen was done to look for non-alcoholic fatty liver disease. Findings were compared between the two genders and odds ratios were calculated for different risk factors.

Results: There were 220 patients including 126(57.27%) males and 94(42.73%) females. Predisposing age (96.03% vs 82.98%), smoking (59.52% vs 2.13%) and past history of stroke (7.14% vs 1.06%) were more common in males, whereas obesity (26.98% vs 48.94%), physical inactivity (41.27% vs 70.21%) and non-alcoholic fatty liver disease (9.52% vs 27.66%) in females. There was no difference in frequencies of family history (7.94% vs 12.77%), diabetes (20.63% vs 22.34%), hypertriglyceridemia (54.76% vs 60.64%) and microalbuminuria (6.35% vs 2.13%).

Conclusion: Smoking is more common in males whereas physical inactivity, obesity and non-alcoholic fatty liver disease are more common in hypertensive females. Risk factor reduction should therefore take gender of the patient into consideration.

KEY WORDS: Hypertension, Coronary heart disease, Primary prevention.

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INTRODUCTION

Coronary heart disease (CHD) is very common. Today, it is more prevalent than any other life threatening disease and continues to take its toll in terms of morbidity and mortality. Developing world is paying the price as 80% of deaths from cardiovascular disease take place here.[1] Indeed, people in our part of the world are more prone to this problem. An estimated 27% of Pakistani people e"40 years of age are affected.[2] With ever-changing lifestyles including unhealthy eating habits, reduced physical activity, increased tobacco consumption, stress and the fast growing obesity epidemic, these figures are likely to shoot up in the future.

For decades now, hypertension is known to be a major factor predisposing to the subsequent development of coronary artery disease. The disease is rampant, as nearly 30% of the adult United States population is affected.[3] Mortality rates from myocardial infarction are higher in hypertensive patients which obviates the need for CHD risk factor assessment and treatment in all such patients.[4]

It is well known that prevention is better than cure. Since patients with hypertension are already at a higher risk for CHD and the effects of any additional risk factor would be multiplicative, it is all the

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more essential to target/ treat risk factors within this specific patient population. An approach based on problems specific to a particular gender would help us develop a targeted approach towards risk factor reduction. This would in turn yield better results as compared to a 'same-for-all' approach. Apart from an obvious advantage to the individual patient, the results would help change the burden of the disease in the community over the years to come.

We carried out this study to determine the actual magnitude of the risk factor prevalence in our patients and to analyze the variations between men and women.

MATERIAL AND METHODS

This cross sectional study was carried out at Department of Medicine, 1 Mountain Medical Battalion Bagh, Azad Kashmir, Pakistan, from March 2012 to September 2012. Patients of either gender older than 30 years of age, on treatment for essential hypertension, were enrolled after getting informed written consent. Every such patient following up at the medical outdoor clinic for the first time during this study period was included. Unwilling patients, those on lipid lowering drugs, those with secondary hypertension and patients not yet started on antihypertensive drugs were excluded. Demographic data was recorded and a detailed history was taken, focusing on the duration of hypertension, presence of diabetes, physical activity, alcohol consumption, family history of premature coronary heart disease in first degree relatives (men >55 years old and women >65 years old), smoking and the medicines being taken. Old medical records available with the patients were reviewed to assess blood pressure control. The targets for a good control were <130/80 mmHg in diabetics and <140/90 mmHg in all other patients. Physical examination focused primarily on measurement of blood pressure and recording of height and weight for calculation of body mass index (BMI). Obesity was defined as BMI >30kg/m^2.

Plasma glucose fasting (upper limit of normal: 5.5 mmol/l), serum total cholesterol (upper limit of normal: 5.2mmol/l), serum triglycerides (upper limit of normal: 1.7mmol/l), spot urinary albumin creatinine ratio were measured with Merck Microlab 300 Automated Clinical Chemistry Analyser. Microalbuminuria was defined as urinary albumin creatinine ratio >30mg/g. Ultrasound abdomen was done by a single operator on all patients to look for the diffuse hyperechoeic hepatic texture characteristic of non-alcoholic fatty liver disease (NAFLD).

Statistical Analysis was done with PASW Statistics 18. Data was expressed as mean± standard deviation. For the purpose of comparison, the patients were divided into two group: the first one comprising of males and the second one consisting of females. Student's t- test was used to compare significance of differences between means/ numerical parameters whereas chi square test was used for frequencies and categorical data, using a sensitivity of 95%. Unadjusted Odds ratios (OR) with 95% confidence interval (CI) were also calculated for the different risk factors in men as compared to women.

RESULTS

The 220 patients enrolled for this study included 126 (57.27%) males and 94 (42.73%) females, having a mean age of 62.63± 8.39 years. As shown in Table 1, the two gender based groups were

Table 1: Characteristics of the study population (n=126).

Parameter	Males	Females	p-value
Age (years)	63.37± 9.54	61.63± 6.46	0.12
Duration (years)	6.11± 7.01	5.56± 4.37	0.50
Systolic BP (mm Hg)	131.03± 16.30	132.93± 14.32	0.37
Diastolic BP (mm Hg)	82.18± 11.51	87.87± 11.08	0.00
Good control of BP (no of patients)	80 (63.49%)	36 (38.30%)	0.00
BMI (kg/m^2)	24.95± 4.96	27.27± 5.02	0.001

Table 2: Comparison of laboratory parameters.

Parameter	Males (n=126)	Females (n=94)	p-value
Plasma Glucose Fasting (mmol/l)	5.26± 1.42	6.01± 2.82	0.011
Serum Total Cholesterol (mmol/l)	4.78± 0.69	5.04±0.93	0.014
Serum Triglycerides (mmol/l)	2.03± 0.89	2.22±0.86	0.126
Urine albumin: creatinine ratio (mg/g)	20.82± 6.29	20.97± 5.48	0.851

Table 3: Comparison of patients having different coronary heart disease risk factors.

S. No.	Risk factor	Males(n=126)	Females(n=94)	p-value
1	Age	121 (96.03%)	78 (82.98%)	0.001
2	Family history of premature CHD	10 (7.94%)	12 (12.77%)	0.238
3	Past history of stroke	9 (7.14%)	1 (1.06%)	0.032
4	Hypertriglyceridemia	69 (54.76%)	57 (60.64%)	0.383
5	Diabetes	26 (20.63%)	21 (22.34%)	0.760
6	Smoking	75 (59.52%)	2 (2.13%)	0.000
7	Physical inactivity	52 (41.27%)	66 (70.21%)	0.000
8	Obesity	34 (26.98%)	46 (48.94%)	0.001
9	Microalbuminuria	8 (6.35%)	2 (2.13%)	0.137
10	Non alcoholic fatty liver disease	12 (9.52%)	26 (27.66%)	0.000

aged matched and had similar duration of hypertension. Male patients had lower BMI and far greater number of them had a good control of blood pressure. Results of different laboratory investigations are depicted in Table 2.

The frequencies of various CHD risk factors in the two genders are compared in Table 3. Age, smoking and a past history of stroke were more common in males, whereas obesity, physical inactivity and NAFLD were more common in females. There was no difference in frequencies of family history, diabetes, hypertriglyceridemia and microalbuminuria between the two genders. Male patients had a higher risk of having the risk factors of age, smoking, a past history of stroke and microalbuminuria whereas women had a higher risk of having all other risks factors. The odds ratios for these different risk factors are also shown in Table3.

DISCUSSION

The prevalence of hypertension increases with age and both these factors contribute to an increased risk for CHD.[5] Different ages in the two groups could have produced several biases in the results, but fortunately enough, this did not happen in our study. Still, a far greater number of men in this study were predisposed to an increased risk of developing CHD because of a lower cut-off limit (45 years as compared to 55 years in females). A past history of stroke contributes to an increased risk of CHD because both these diseases have a similar underlying pathophysiology involving atherosclerosis. In Pakistan, it is generally believed that 60% of all patients admitted with stroke are men.[6] Significant past history in a greater number of our male patients is in keeping with the increased incidence of stroke in males.

Tobacco smoking is common in Pakistan. According to the data collected during the National Health Survey of Pakistan 1990-94, nearly 25% of men and 3.5% of women smoke.[7] In a more recent study done at Karachi, 35% of males and 7% of females smoked.[8] Strange enough, smoking rates were much higher than these in our male patients and lesser in females. Greater incidence of smoking amongst males as compared to females is a worldwide phenomenon.[9] Major inhibitions on females in our society include social pressures and cultural taboos as well as the fact that they are dependent on male partners for their financial needs. As can be judges from the results, smoking is perhaps the only major modifiable risk factor seen predominantly in men. It inflicts damage in direct proportion to the intensity and duration of exposure. Encouragement of smoking cessation thus merits very special attention in this category of patients. Apart from the benefits in the concerned person himself, it would also be beneficial for the society at large because of reduced passive smoking as well.

The effects of exercise on CHD risk reduction are more marked in females.[10] Yet, it is very unfortunate that women exercise less frequently as is very much evident from our study. With the rapidly changing life styles, exercise is now becoming a thing of the past. According to World Health Organization estimates, physical inactivity causes 3.2 million deaths annually.[11] Many factors encourage physical inactivity, including overcrowding, lack of parks and other recreational facilities, busy office routines and other more attractive activities to do during leisure time. In addition to its direct effect, lack of exercise contributes to the risk of CHD by producing obesity. Obesity was commoner in female patients. Our results are comparable to a survey done on 1230 Pakistani individuals in 2006.[12] Obesity was seen in 30% males and 56% females. This is higher

than 13% (men) and 22% (women) prevalence in general Pakistani population aged 25-64 years using the same definition as ours.[13] Most probably this trend towards increasing obesity is a reflection of inadequate physical activity, as also suggested by Joshi et al.[14] For social reasons, women belonging to rural areas of our country usually remain confined to their houses. In urbanized populations, television and computers are the main culprits. Nevertheless, no one can negate the role of changing dietary habits with a trend towards increased consumption of fast food in the recent years.

In Pakistan, prevalence of diabetes is around 10%.[15] The rates in our study were higher than this probably because of section criteria. There was no difference between the two genders with regards to the frequency of diabetes. This is strange considering that obesity, which is one of the main factors predisposing to the development of type 2 diabetes, was commoner in females. The results conform to the findings to several other studies.[16] However, short term glycemic control was poorer in females. A major reason for this is a general trend towards poor compliance to pharmacological therapies and lifestyle interventions in this gender.

The gold standard for the diagnosis of nonalcoholic steatohepatitis/ nonalcoholic fatty liver disease is liver histology and in comparison, ultrasound has a sensitivity and specificity of 8% and 94%.[17] Yet, we relied on the latter only because it is readily available, non-invasive and cheap. Due to its well-recognized association with obesity, this again was more common in females. The frequencies are higher than the figure of 13.5% quoted by Niaz et al in a hospital based study done at Karachi (Pakistan).[18] This probably is because of a different patient profile. Being hypertensive, our patients were prone to have an increased prevalence of other factors like dyslipidemia and obesity that predispose to development of NAFLD.

The preceding paragraphs have proved that the females differ from males mainly with regards to the triad of physical inactivity, leading to obesity and subsequently NAFLD. Physical inactivity confers double the risk of CHD as compared to active people.[19] There is thus a dire need to educate our female patients during routine outdoor clinics about the benefits of regular physical activity and programmed weigh loss. It is all the more important in the presence of hypertension since the blood pressure would also improve in addition to a feeling of general well-being.

This study has a few limitations. Some of the risk factors were not assessed. These include C reactive protein and fibrinogen levels (due to resource limitations) and the impact of psychosocial factors and passive smoking. Important guidelines on management of lipid abnormalities lay primary emphasis on achieving pre-defined serum low density lipoproteins (LDL) while treating dyslipidemia in a given patient. Due to non-availability of kits in our laboratory, LDL and high density lipoproteins could not be measured/calculated. Nevertheless, this study relied on estimation of serum triglyceride levels, which of course defines a secondary target in patients on lipid lowering drugs.

CONCLUSION

In summary, there are distinct differences in the Coronary heart disease risk factor profiles of hypertensive men and women. Smoking is more common in males whereas physical activity, obesity and non-alcoholic fatty liver disease are more common in females.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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