Research Paper

The Sciences 1 (6): 396-399
November-December, 2001

Study on Heart Attack with Special Reference to Hypertension In People of Faisalabad

Mehnaz Afzal, [1]M. Tariq Javed, Kausar Almas, [2]Tahir Zahoor and Alia

A total of 200 patients were selected and were divided into five age groups (<40, 40-50, 51-60, 61-70 and > 70 Years), two socioeconomic status, i.e., low and middle class, and gender. Results revealed that patients admitted with heart attack, 63.5 % were having hypertension and there found an association between hypertension and family history of heart attack. The occurrence of heart attack in both hypertensive and non-hypertensive group was more in males than females and was higher in peoples of more than 41 years of age. Data also showed that occurrence of heart attack due to hypertension was high in people belonging to cities than villages. Data did not reveal difference between hypertensive and non-hypertensive patients with respect to tea intake and cigarette smoking. Serum cholesterol was higher ($P<0.05$) in hypertensive than non-hypertensive patients taking 6-10 cigarette day^{-1}. Serum triglyceride levels were higher ($P<0.05$) in hypertensive than non-hypertensive males. Serum HDL was higher in patients used oil than those used ghee. Serum uric acid appeared to have relation with beef intake as the levels were higher in beef eaters in both hypertensive and non-hypertensive patients.

Key words: Heart attack, hypertension, HDL, LDL, cholesterol, socioeconomic

The Sciences (ISSN 1608-8689) is an International Journal serving the International community of Medical Scientists

For further information about this article or if you need reprints, please contact:

M. Tariq Javed
Department of Veterinary Pathology,
University of Agriculture,
Faisalabad, Pakistan

E-mail: mtjaved@fsd.paknet.com.pk

ANSInet
Asian Network for Scientific Information

Department of Home Economics, [1]Department of Veterinary Pathology, [2]Department of Food Technology, University of Agriculture, Faisalabad, Pakistan

Introduction

Heart attack occurs probably as a result of interaction between several genetic and environmental factors (Marenberg *et al.*, 1994; Sovensen *et al.*, 1988). Many cardiovascular risk factors aggregate within the families, suggesting that genetic and environmental factors make significant contribution in the incidence of disease (Masana *et al.*, 1996). Several well-recognised risk factors for heart attack have been identified including aging, hypertension, hyperlipidaemia, diabetes, smoking, obesity and sedentary life style (Legrys, 1999). The knowledge about the risk factors influencing the individual risk of coronary heart disease is considerable and continuously growing. Family history of myocardial infarction is another well-established risk factor for cardiovascular disease (Rotimi *et al.*, 1994; Circuzzi *et al.*, 1997). Family history of myocardial infarction had an adverse cardiovascular risk factor with regard to hypertension, cholesterol concentration, ratio between high density lipoprotein (HDL-cholesterol) total cholesterol and smoking habits. These risk factors, therefore, may acts as mediators of the familial predisposition to myocardial infarction.

Hypertension or high blood pressure is a significant risk factor for heart attack (Chobanian and Alexander, 1996). Hyperlipidaemia may be the significant contributor, which gets deposited in the walls of the blood vessels causing loss of its elasticity and thus increase blood pressure. In females, the situation arises after the menopause, when total cholesterol and (low density lipoprotein (LDL) increases and HDL decreases. It has been reported that about 60% of the women between the age of 65-74 were hypertensive compared with 13% of the females between the age of 35-44 years (Anonymous, 1998).

The symptoms of a heart attack can be subtle and hard to identify. Fewer than half of these patients with acute myocardial infarction experienced dizziness, upper back pain, indigestion and palpitation, while some experienced cough and fainting. The later symptoms although uncommon, might still be useful to highlight in public education campaigns, especially those that were fairly common in population subgroups, such as upper back pain in women (Goff *et al.*, 1997).

Much of the work has been done on relationship of hypertension with heart attack in other parts of the world but such information is lacking particularly with reference to age, sex, socioeconomic status and other associated factors in people of Faisalabad. Therefore, this study was planned to find out the association of hypertension with heart attack among local people of different socioeconomic status, age and sex. It was also aimed to elucidate the most common symptoms exhibited by the people of different age, sex and socioeconomic status having hypertension as well as serum cholesterol, HDL, LDL, triglycerides, and urea levels in these subjects.

Materials and Methods

The research work was carried out on 200 patients admitted in coronary care unit (CCU), Allied Hospital, Faisalabad from May to October 2000. These patients were selected at random, from those admitted in the hospital with coronary heart disease. These subjects were grouped on the basis of socioeconomic status, age and gender and they were divided into low class (maximum earning of 5,000 per month or less) and middle class (minimum earning of 5,000 and maximum earning of 15,000 per month).

Blood samples of about 5ml were collected, serum were separated and were used for biochemical analysis. History including clinical symptoms, dietary intakes, family history etc. was collected from patient's attendants.

Serum total cholesterol (Human GmbH; Cat. No. 10017, 10015; Lot No. 669-A), high density lipoprotein (HDL)(Human GmbH; Lot No. 138-A), triglycerides (Human GmbH; Cat. No. 10163, 10164, 10165, 10166; Lot No. 341-B), blood urea (Diasys International Holzhein; Cat. No. 10310021, 13101991026, 10310023; Lot No. 175/99) and serum uric acid (Human GmbH; Cat. No. 10037, 10045, 10039, 10036; Lot No. 926) were determined spectrophotometrically at wavelengths of 546, 546, 546, 340 and 546nm, respectively by using commercial kits. Standard procedure was followed mentioned on the kits. Low density lipoprotein (LDL) was calculated by using the formula:

$$\text{LDL} = \text{Serum total cholesterol} - \frac{\text{Triglyceride}}{5} = a$$

$$a - \text{HDL} = \text{LDL}$$

Data collected was analysed by ANOVA using the General Linear Models procedure of SAS (ASA Institute, 1996) and means were compared by DMR test using SAS.

Results and Discussion

Of the patients admitted with heart attack, 63.5% were hypertensive (Table 1) which suggested association of hypertension with heart attack in local population. It has been reported that hypertension ultimately lead to heart attack (Whelton *et al.*, 1996; Dahlof *et al.*, 1991). Jhala *et al.* (1999) ranked hypertension as a single risk factor to be the first, next to the obesity followed by hyperlipidaemia, diabetes, tobacco habit and family history of coronary artery disease. Similarly, Richman *et al.* (1999) reported that hypertension to be the more prevalent risk factor in diabetic than in non-diabetic subjects. During this study there was observed an association between hypertension and family history of heart attack (Table 1).

The data also suggested that occurrence of heart attack was rather associated with age, as heart attack was high in people of greater than 41 years of age in both hypertensive and non-hypertensive patients (Table 1). These findings were in line with those of Jhala *et al.* (1999) who reported higher incidence of coronary artery disease in subjects of 51-60 years of age. They further reported that the incidence was higher in males than females with 6:1 ratio. A higher occurrence of heart attack both in hypertensive and non-hypertensive was also observed in male than female during this study (Table 1). However, among females, occurrence of heart attack was almost double in hypertensive than non-hypertensive patients (Table 1), which indicated greater association of hypertension with heart attack in females rather than males. It has previously been reported that women have higher prevalence of hypertension compared to men (Anonymous, 1998), further it has been reported that women between the age of 65-74 years were hypertensive, compared with approximately 13% women between the age of 35 to 44-years (Anonymous, 1998). Results also suggested that patients belonging to cities suffered more than those lived in villages, while the occurrence of heart attack was having similar pattern of higher occurrence in hypertensive patients in people of each socioeconomic status (Table 1).

Results with respect to smoking and hypertension might not be real, as the percent smokers were only 27.6 % in hypertensive patients (Table 1). It appeared that most of these patients had left smoking after they identified that they had heart trouble which was also evident from the prevalence of

Table 1: Mean percent occurrence of heart attack with relation to various parameters in hypertensive and non-hypertensive patients.

Parameters	Hypertensive	Non-hypertensive
Socioeconomic Status		
Low	54.3	67.1
Middle	45.7	32.9
Significant level		(P<0.05)
Age Groups		
< 40 years	7.1	6.8
41-50 years	37.0	32.9
51-60 years	26.8	26.0
61-70 years	26.0	23.3
> 70 years	3.1	11.0
Significant level	(P<0.001)	(P<0.01)
Sex		
Male	57.5	72.6
Female	42.5	27.4
Significant Level		(P<0.001)
Live in Village	29.1	38.4
City	70.9	61.6
Significant level	(P<0.001)	(P<0.05)
Family History		
Yes	73.2	65.8
No	26.8	34.2
Significant level	(P<0.001)	(P<0.001)
Smokers	27.6	42.5
Significant level	(P<0.001)	
Previous IHD	70.1	53.4
Significant level	(P<0.001)	
Beef		
Taken	46.5	54.8
Not Taken	53.5	45.2
Overall	63.5	36.5

Means are compared by Fisher Chi-square analysis and are significant at given probability levels in a column for each parameter

Table 2: Percent occurrence of different eating habits in hypertensive and non-hypertensive patients.

Parameters	Hypertensive	Non-hypertensive
Ghee/Oil Use		
Ghee	56.7	57.5
Oil	43.3	42.5Tea
Tea Intake		
No	26.8	11.0
1-3 cups	59.8	74.0
4-7 cups	13.4	13.7
8-10 cups	0.0	1.4
Cigarettes		
No	66.1	64.4
1-5	11.8	6.8
6-10	2.4	8.4
11-20	15.0	15.1
21-40	4.7	5.5
Significant level	(P<0.001)	(P<0.001)

Means are compared by Fisher Chi-square analysis and are significant at given probability levels in a column for each parameter

previous ischaemic heart disease in these patients (Table 1). However, Dunn *et al.* (1999) reported a considerable relationship between a myocardial infarction and smoking in young women. Data showed that there was a relative association between hypertension and use of ghee (Table 2). However, the distribution of patients among hypertensive and non-hypertensive patients were similar with respect to tea intake and cigarette smoking as higher proportion of people took 1-3 cups of tea and were nonsmokers (Table 2). Kawachi *et al.* (1993) reported that current or ongoing smoking habits were related with risk of heart attack even after adjustment for age, gender and hypertension.

As regard clinical symptoms in hypertensive and non-

Table 3: Percent occurrence of different levels of education and occupations in hypertensive and non-hypertensive patients.

Parameters	Hypertensive (%)	Non-hypertensive (%)
Education		
No	55.9	46.6
Undermatric	23.6	24.7
Matric	3.9	5.5
Undergraduate	3.9	5.5
Graduation	10.2	11.0
Postgraduate	2.4	6.8
Occupation		
None	15.7	26.0
Work	8.7	13.7
Farmer	5.5	6.8
Tailor	0.8	2.7
Shopkeeper	3.9	1.4
Driver	2.4	1.4
Student	-	1.4
Business	9.4	5.5
Job	11.8	15.1
House wife	41.7	24.7
Lady health worker	-	1.4

Means are compared by Fisher Chi-square analysis and are significant at P<0.001 in a column.

Table 4: Comparison of means (mg/dl) ± SD of various biochemical parameters in hypertensive and non-hypertensive patients of beef and non-beef eaters.

Parameters	Hypertensive	Non-hypertensive
Triglycerides		
Beef	196.29±106.69	179.30±104.23
No Beef	192.10±55.75 a	169.45±46.30 b
Serum Uric acid		
Beef	7.14±1.65 A	6.97±1.69 A
No Beef	4.83±1.03 B	4.82±1.29 B
Cholesterol		
No	189.55±55.11 B	171.38±41.84
1-5	208.00±58.84 B	177.80±43.04
6-10	279.33±193.84 A	207.16±49.99
11-20	207.84±75.29 B	213.36±101.57
21-40	181.17±43.32 B	176.25±15.11
Blood Urea		
No	34.94±14.24 B	39.59±15.63
1-5	31.73±11.67 B	28.60±10.55
6-10	57.67±10.26 A	42.83±18.99
11-20	34.84±15.44 B	36.45±14.75
21-40	37.17±7.94 B	29.25±11.59
Triglycerides		
Male	199.11±101.42 a	162.11±31.44 Bb
Female	187.20±48.34	208.00±136.59 A
HDL		
Ghee	43.59±2.91 B	50.95±43.29
Oil	58.22±50.13 A	57.61±37.70
Triglycerides		
Ghee	199.60±74.16 a	163.40±51.24 b
Oil	186.65±93.61	190.00±111.63

Means with different small letters in a row and with different capital letters in a column are statistically significant at P<0.05.

Table 5: Comparison of means (mg/dl) ± SD of serum uric acid in hypertensive and non-hypertensive patients of different ages.

	Age Groups				
Parameters	<40	41-50	51-60	61-70	>70
Serum uric acid					
Hypertensive	5.60± b 1.20	5.69± b 1.53	6.24± b 1.58	5.63± b 1.52	8.58± a 5.35
Non-hypertensive	4.90± 1.26	5.98± 1.67	6.34± 1.51	6.02± 1.47	5.89± 1.45

Mean with different small letters in a row are sadistically significant at P<0.05.

hypertensive patients there were no real differences in them. The results suggested that the clinical symptoms were independent of hypertension. The pattern of clinical symptoms was similar with respect to age, socioeconomic status and gender in hypertensive and non-hypertensive patients (Data not presented). This suggested that clinical symptoms were independent of these parameters. The data collected showed similar pattern of occurrence of heart attack with respect to education and occupation, both in hypertensive and non-hypertensive patients with higher occurrence in uneducated and no work category in each (Table 3). It may be mentioned that higher occurrence of heart attack in these patients might be related with the conditions prevailing in the society. Majority of the people still belonged to no education category or Undermatric and as the occurrence of heart attack was more frequent in elderly people which mostly belonged to no work category as older people become dependent on their sons etc.

Higher serum cholesterol in hypertensive patients who took 6-10 cigarettes day^{-1} suggested association of cholesterol with moderate smoking as values were higher in both hypertensive ($P<0.05$) and non-hypertensive patients of 6-10 cigarettes day^{-1} group (Table 4). Stavenow and Kjellstrom (1999) reported a significant interaction between triglycerides and cholesterol and they also found a higher levels of these in hypertensive patients. The levels of triglycerides showed significant ($P<0.05$) difference only in males between hypertensive and non-hypertensive patients, while non-significant in females (Table 4) which probably is related with metabolic difference in them.

Higher serum uric acid in elderly hypertensive patients, suggested association of serum uric acid with hypertension in elder patients (Table 5). Serum uric acid appeared to have relations with beef intake as the levels were higher in beef eaters in both hypertensive and non-hypertensive patients (Table 4). Higher HDL in oil than ghee user in both hypertensive and non-hypertensive patients was suggestive of the relationship of oil use with HDL serum level (Table 4).

From the results it was concluded that occurrence of heart attack is greater in people more than 40 years, in males and those live in cities. Moderate smokers in hypertensive group have higher cholesterol. Serum uric acid in elder patients has relationship with hypertension and serum HDL with use of oil.

References

Anonymous, 1998. American Heart association. http://www.amhrt.org/Heart-and-stroke-A-Z-Guide/obesity.html.

Chobanian, A. V. and R. W. Alexander, 1996. Exacerbation of atherosclerosis by hypertension: potential mechanisms and clinical implications. Arch. Intern. Med., 156: 1952-1956.

Circuzzi, M., H. Schargrodsky and J. Rozlosnik, 1997. Frequency of family history of acute myocardial infarction in patients with acute myocardial infarction. Am. J. Cardiol., 80: 122-127.

Dahlof, B., L. H. Lindholm, L. Hansson, B. Schersten, T. Ekbom and O. Westerp, 1991. Morbidity and mortality in the Swedish trial in old patients with hypertension. Hypertension, 338: 1281-1285.

Dunn, N. R., B. Faragher, M. Thorogood, L. de Caestecker, T. M. MacDonald, C. McCollum, S. Thomas and R. Mann, 1999. Risk of myocardial infarction in young female smokers. Heart, 82: 581-583.

Goff, D. C., M. Z. Nichaman, R. D. J. Chanu and D. R. Oetizc, 1997. Greater incidence of hospitalised myocardial infarction among Mexican American than non-Hispanic whites. The corpus Christi. Heart Project 1988-1992 circulation, 95: 1433-1440.

Jhala, C. I., V. A. Shah, U. V. Shahuv and J. D. Dafda, 1999.Pattern of cardiac disorders and epidemiology of coronary disease in urban population of Ahmedabad. J. Indian med. Assoc., 97: 237-240.

Kawachi, I., G. A. Coldtiz, M. J. Stemfer, W. C. Willet, J. E. manson, B. Rosner, F. E. Spetzer and C. H. Hennekens, 1993. Smoking cessation and decreased risk of stroke in women. J. A. M. A., 269: 232-236.

Legrys, V. A., 1999. Coronary heart disease in women and the role of the laboratory. Clin. Lab. Sci., 12: 246-251.

Marenberg, N. E., N. Risch, L. F. Berkman, 1994. Genetic susceptibility to death from coronary heart disease in a study of twins. N. Engl. J. Med., 330: 1041-1046.

Masana, L., E. Farinaro, S. D. Henauw, 1996. Blood pressure in young adults without a paternal history of premature coronary heart disease in Europe. J. Hum. Hyten., 10: 207-213.

Richman, P. B., G. X. Jr. Brogan, A. N. Nashed and H. C. Jr. Thode, 1999. Clinical characteristics of diabetic vs non-diabetic patients who "rule in for acute myocardial infarction. Acad. Emerg. Med., 6: 719-723.

Rotimi, C., R. Cooper and G. Cao, 1994. Familial aggregation of cardiovascular disease in African American pedigrees. Genet. Epidemiol., 11: 397-407

SAS Institute, 1996. SAS User's Guide. Statistic. Version 6.21 Edition. Cary. North Carolina USA.,

Sovensen, T. A., G Nielsen and P. K. Andersen, 1988. Genetic and environmental influence on premature death in adult adoptees. New Engl. J. Med., 38: 727-732.

Stavenow, L. and T. Kjellstrom, 1999. Influcence of serum triglyceride level on the risk for myocardial infarction in 12,510 middle aged males: interaction with serum cholesterol. Ather., 147: 243-247.

Whelton, P. K., J. D. Williamson, G. T. Louis, B. R. Davis and J. A. Cutler, 1996. Experimental approaches to determining the choice of first step therapy for patients with hypertension. Clin. Exp. Hyp., 18: 569-579.

MS received 8th August, 2001; accepted 10th November, 2001