Original paper

Coronary Heart Disease in Karbala Population Related to Central Obesity and Other Coexisting Risk Factors – Comparative Study

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Background: Around 6 years ago, a study has been published describing the prevalence of improvement life style behavior in Karbala population in the period between1/12/2004-1/6/2005.

Objectives: comparative study is conducted to estimate prevalence of improvement life style behavior in Karbala population and compare it with the previous study.

Setting: Coronary care unit (CCU) of Hussein teaching hospital.

Design: Prospective study.

Methods: one hundred patients participated in this study admitted in CCU during the period from 1/12/2010 to 1/6/2011, all patients newly diagnosed as having acute (MI) by selected criteria in relation to central abdominal obesity (W.C), BMI, age, sex, fat consumption, smoking, physical activity, alcohol, fruit and vegetable consumption.

Results: mean age (females 57.5 years, males 63.3 years) males 65%, females 35%, consumed saturated fat 54%, smoking 39%, Alcohol 0%, consumer of fat 54% fruit and vegetables 63%, W.C (males 96.7±12.9, females 99.9 ±16.4)

Conclusion: The comparative study shows an adverse results, improvements at certain aspects of life style behavior.

Keyword: Coronary heart disease (CHD), central obesity (Waist circumference W.C).

Introduction

The age (males≥45, females≥55) is the most powerful independent risk factor for CHD[1]. Premenopausal women have lower rate of CHD than men, despite this sex difference disappear after menopause due to diminish of high density lipoprotein (HDL)[2]. Age and sex are immutable excess coronary risk in men compared with pre-menopause of women. Diet deficient in polyunsaturated fatty acid associated with increased CHD. Obesity wether central or trunked is independent risk factor particularly when associated with other risk factors (hypertension, DM, physical inactivity, BMI≥30 Kg/m^2)however the presence of central obesity is highly correlate metabolic risk factor than an elevated BMI[3.4.] Therefore simple measure of waist circumference (W.C) is recommended as a strong marker for CHD.[5] Male W.C>102cm, female>88cm have greater risk factor of D.M, stroke, C.A.D and early death than equally obese patient with lower W.C. ratio. The visceral fat is more hazardous than subcutaneous fat as epicardial fat has the same character of visceral fat that has directly local effect into cardiac muscle [6]. Any three of five risk factors identify metabolic syndrome (W.C, TG>150 mg/dl, HDL <40 mg/dl, Bp>130180, fasting glucose>110mg/dl)[15]. However weight alone is not an issue because metabolic syndrome occurs in people who are not overweight but have substantial visceral fat [6-9]. Smoking extents its atherogenic effects by inducing catecholamines release and increase platelets reactivity, this explains sudden cardial death and CAD[10].

Physical activity is valuable for weight control, increase HDL, improve carbohydrate tolerance, and decrease the

risk of CAD than sedentary life [11-13]. Consumption of fruit and vegetables seems to offer significant protection of CHD of particular interest 10% reduction of CAD for every one piece of fruit consumed per day[3].

Patients and methods

One hundred Iraqi patients were participated in this study from coronary care unit admitted in Al-Hussein teaching hospital in Karbala governorate during the period from 1/12/2010 till 1/6/2011; all patients were newly diagnosed as having CHD. The selected criteria for cardiac patients are, the diagnosis of CHD (acute MI or unstable angina with recent ECG changes, (stable angina was excluded from the analysis) was defined by two features recent electrocardiograph changes compatible clinical symptoms and markers (specific diagnostic enzyme elevations of SGOT, CPK, LDH, troponin T or I are not always available in Hussein teaching hospital). All participants were informed about the aim of the study and agreed to give requested information. The study includes the age, sex, W.C, smoking, Physical activities BMI, weight consumed fat.

Current smokers were defined as those who smoke at least three cigarettes per day. Physical activity was defined as any type of non-occupational physical exercise 20 minutes at least 2-3 times per week during past year.

Current alcoholic were defined as those who consumed alcohol once per week past year. Consumed fruits and vegetables used in questioner are more than 3 times per week.

Anthropometrics: Measurement of WC and calculation of BMI were done according to standard techniques and equipment. WC was measured at the midway point between the lowest rib and the iliac crest. Normal WC male ($\leq$102 cm and female was $\leq$88cm). BMI is weight / height^2, weight was measured in kilograms and height was measured in centimeters. (Normal BMI 18.5-24.9 Kg/m^2).

Results

Mean age (57.5 $\pm$13 and 63.3 $\pm$10.3) of males and females respectively. Most patients admitted to CCU were males 65% ,females are 35%. 39% patients were cigarette smokers (31% males, 8% females) using international activity questioner, the results of alcohol and physical activity are in both males and females are zero. Patients consumed saturated fat 54% (males 34%, females 20%), while 46% consumed unsaturated fat. Consumption of fruits and vegetable 63%(males 45% and females 18%) while non-consuming patients are 37%. The result of anthropometrics values, mean weight (males 76 14.2, females 66.3 16.5). BMI mean (males 27$\pm$4.2, females 27.4 6.85) male BMI$>$ 25Kg/m^2 are 42% while females BMI$>$25 Kg/m^2 is 21% and 14% respectively, mean WC males 96$\pm$12.9 – females 99.9$\pm$ 46.5, male WC $>$102 cm is 20% while $<$102 cm are 45% , females $>$88 cm are 27% while $<$88 cm is 8%.

Discussion

The goal of this comparative study is to evaluate the promotion of life style in Karbala population after embargo period involving Iraq (1991-2003)(first study was done between 1/12/2004 – 1/6/2005). The second study shows improvement in life style in fat, alcohol, fruit and vegetable consuming, smoking, physical activities, age and sex while similar results take place in another anthropometry values (WT, W.C, BMI) tables 3 and 4.

Starting with mean age (males 57.5 years, females 63.3 years) shows improvement in life span especially in females in comparison with first study and the age is important risk factor for CHD [1,2,16] (male$\geq$ 45, females $\geq$55) tables 1 and 2.

Regarding to sex risk factor, the study shows diminish prevalence in males in

comparison with females in first study as the males sex in independent risk factor [1,16] (males 65%, females 35%). The fat consumption considered more impressing improvement (54%) compared with first study (90%) as the hyperlipidemia is important risk factor leading to metabolic syndrome. This is due to progression in awareness and health education of the people to the risk of dyslipidemia (TG>150mg/dl, HDL<40mg/dl) and improved the purchasing power of Karbala population after lifting of embargo by taking unsaturated fat (liquid) but we must not forget that ministry of trade start supplying unsaturated fat after 2005 in food basket regime, this reflect significant improvement in life style in comparison with first study ($p<0.05$). In the second study there are reduction in the incidence smokers in admitted CCU unit patients (39%) that considered significant predictor of health education, may be related to diminish stress factor and awareness of smoking risk in this period than previous one(63%) ($p<0.05$) [1,10,16,18] (tables 1 , 2).

Table 1. Life style study of Karbala Population 2005.

Parameter	Subclasses of Parameter	Number		
		Male	**Female**	**Total**
Sex		76	24	
Age		55.6 ± 12.1	57.3±10.1	
Type of consumed fat	Saturated unsaturated	70 6	20 4	(N=90) (N=10)
Diabetes	Diabetic Non diabetic	8 68	10 14	(N=18) (N=82)
Blood Pressure	Low Normal High	3 61 12	2 14 8	(N=5) (N=75) (N=20)
ECG	A F DAF	48 28 0	13 8 3	(N=61) (N=36) (N=3)
Smoking	Smoker Nonsmoker	53 23	10 14	(N=63) (N=37)
Alcohol	**Alcoholic** **Non-Alcoholic**	**4 72**	**0 24**	**(N=4)** **(N=96)**
Physical Activity	**Familiar with exercise** **Not familiar with exercise**	**11** **65**	**0 24**	**(N=11)** **(N=89)**
Fruit and Vegetables consuming	**More than three a week** **Less than One a week**	**15** **61**	**8** **16**	**(N=23)** **(N=77)**

The society start giving attention to fruit and vegetables lead to rising the ratio in second study 63% with high significant difference ($p<0.05$) in comparison with first study (table-1) which is important in primary prevention of CAD. Alcohol consumption is zero due to religious reasons (table 1 and 2) [1,17, 19].

The physical activity was low (11%) in first study and becomes zero in recent study (table 2). This adverse result not expected in comparison study with improving life style and health education as sedentary life style double risk of CAD in both genders. This fact can be explained by considering the health education regime is not organized to invade all aspects of life style behavior in Karbala society because of the concept of physical activity is not easily accepted and difficult to be applied in developing countries like Iraq, although the population understand its importance in primary prevention of CAD. The study of anthropometric factors shows similar results in both studies including W.C and BMI except rising weight of males in the second study with significant difference ($p<0.05$) that considered bad

prognostic factor because of obesity in independent risk factor for CHD (tables 3,4) this result cannot be explained in comparison with improved life style of others factor.

Waist circumference (W.C) is independent risk factor leading to CAD specially if added to BMI. In both studies, the result of W.C and BMI measures are similar that indicates gloomy picture that rising the doubts about the process of health education program[16,1,17].

Conclusions and recommendations

There are successful aspects in certain life style and failure in other factors. The study emphasizes the demand for intensive evaluation of health education program to invade all failure aspects of life style in Karbala population.

Table 2. Life style study of Karbala Population 2011.

Risk factors	Parameters	Male	Female	Total
Sex		65	35	100
Age		57.5±13	63.3±10.9	
Type of consumed fat	Saturated	34	20	54
	Unsaturated	31	15	46
Diabetes	Diabetic	22	9	31
	Non Diabetic	43	26	69
Blood Pressure	High	32	25	57
	Normal	33	10	43
ECG	Anterior	45	12	57
	Inferior	17	18	35
	Double	3	5	8
Smoking	Smoker	31	8	39
	Non Smoker	34	27	61
Alcohol	Alcoholic	Zero	Zero	Zero
	Non Alcoholic	65	35	100
Physical Activity	Familiar with Exercise	Zero	Zero	0
	Not familiar with Exercise	65	35	100
Fruit and Vegetables consuming	More than 3 times a week	45	18	63
	Less than once a week	20	17	37
Arcuse senalis	Positive Arcuse senalis	29	21	50
	Negative Arcus senalis	36	14	50

Table 3. Comparative study of Anthropometric values between Males and Females 2005

Parameter	Anthropometric values		Unit	Significance difference (p<0.05)
	Male	Female		
Total Weight	70.9±14.1	66,5±16,01	Kilogram (Kg)	Not Significant
Total Length	1.65±0.09	1.56±0.11	Meter (M)	Significant
Total BMI	26.2±5.1	27.3 ±5.5	Kg/M^2	Not Significant
In females Patients: BMI>25 Patients: BMI<25		14 10	Kg/M^2	
In males Patients: BMI>25 Patients: BMI<25	45 31		Kg/M^2	
Total W.C.	97.4±16.0	99.4±13.9	Centimeter (cm)	Not Significant
In females: Patients: W.C>88 Patients: W.C<88		19 5	Centimeter (cm)	
In males: Patients: W.C>102 Patients: W.C<102	28 48		Centimeter (cm)	

Table 4. Comparative study of Anthropometric values between Males and Females 2011.

Parameter	Male	Female	Unit	Significance P<0.05
Mean weight	76.314.2	66.316.5	Kg	Significant
Mean height	1.670.09	1.550.07	Meter	Not Significant
Mean BMI	274.2	27.46.85	Kg/m^2	Not Significant
Females BMI > 25 BMI< 25		21 14	Kg/m^2	
Males BMI> 25 BMI<25	42 23			
Mean W.C	96.712.9	99.916.4	Cm	Not Significant
Females W.C>88 W.C<88		27 8	Cm	
Males W.C> 102 W.C< 102	45 20		Cm	

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