Early Diagnosed Atherosclerosis for Individual under Forties and its Relation to Diet and Stress

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Abstract

Coronary artery disease is the leading cause of death in most countries in the past three decades, as well as the mortality from cardiovascular diseases including Coronary Heart Disease and Stroke, has declined more than (50%) over the past (30) years(Rozanskii, 1997). Atherosclerosis is a patchy, special type of thickening and hardening of medium size and large arteries that account for majority of cases in heart diseases. It is multi-factorial diseases dependent on genetic disposition and multiple other risk factors (Gill, 2003). Approximately (50 million) deaths occur throughout the world each year with almost (80%) of these (39 million) occurring in developing countries (Tienboon, 2001).

Descriptive design using a retrospective (case - control) approach was carried throughout the present study for the period of July, 2001 to February 6th, 2003. The study was conducted at the Iraqi Center for Heart Disease and Ibn Al-Nafees Center for Cardiovascular and Heart Diseases and Surgery in Baghdad.

Probability "simple random" sample of (352) subjects with atherosclerosis was selected (182=cases and170=controls). These patients had attended the outpatient's clinics at these centers for diagnosis and treatment of almost all cardiovascular diseases that resulted due to having atherosclerosis. A questionnaire was used and presented into (6) main parts. Each one was concerned with the measurement of issues related to the phenomenon of interest.

Data were collected from (22) subjects (12 cases and 10 controls) from the centers in which the study was conducted, to estimate the reliability through The measurement of its equivalence by Cronbach Alpha which was presented as (0.84). The content validity was determined through the use of panel of experts.

The analysis indicated that difference was found between the cases and the controls' family type relative to the incidence of atherosclerosis. Significant difference was also found between the two groups relative to social readjustment scores and with respect to the incidence of atherosclerosis. The results indicated that there were only (6) factors that contributed significantly to the incidence of atherosclerosis as they were weighed with an Eigen value of greater than one. These factors were **calories, body mass** index, marital status, **sex, dietary pattern, and type (A) personality.**

The study concluded that the findings highlighted the negative impact of risk factors on the incidence of atherosclerosis which included body mass index, dietary patterns, typically daily eating pattern (calories / day), and cholesterol level throughout their association with diet. Furthermore, the domain of stress as manifested through multi-factors of type (A) personality; social readjustment (life -events) and occupational stress had negative impact upon atherosclerosis. The study recommended that diet and stress intervention program for promoting community health through modification of dietary

habits, attitudes; cholesterol level reduction and behavioral modification for stress management can be designed and implemented. Health promotion centers and community based health-related project can be established with an emphasis on community, family and work place involvement.

1. Introduction

Atherosclerosis is an extremely complex process that is recognized in humans even in the fifteenth century. The lesions of atherosclerosis occur principal!}" in the inner most layer of the artery wall (intimae) more advanced lesions, called fibrous plaques and begin to develop in the coronary arteries after (20) years of age in countries with high incidence cf atherosclerosis (Chombless. 2002).

Atherosclerosis is a patchy, special type of thickening and hardening of medium size and large arteries that account for majority of cases in heart diseases, it is a multi-factorial disease dependent on genetic disposition and multiple other risk factors (Hoeymans, 1996).

Coronary heart disease has been the leading cause of death in most developed countries in the past three decades, and the mortality from cardiovascular diseases including coronary heart disease and stroke, has declined more than (50%) over the past (30) years(Rozanskii, A. and

VlumenthaL 1999) Contributing to this decline in mortality there are some factors, such as improved technologies and therapies for treatment of cardiovascular diseases and improved life style by health education (Gill, 2001).

Population approach to primary prevention is considered the first priority, and there has been much research into new risk factors. Such new knowledge cannot substantially reduce the burden of cardiovascular disease because the disease depends on the life style of population (Robert, 2001).

The relations between risk factors and diseases events are continuous, and most events occur in people in the middle range of the risk factors distribution who are not normally judged high risk. Most of the population is at risk because the strategy is promotion of the measurement of risk factors, such as cholesterol concentration (Ross, 1990).

Individual risk assessment could be used for the primary aim of reducing population risk or for treatment. Advancement of global cardiovascular disease prevention needs strong international leadership and willingness to work with communicable disease control (Robert, 2001).

Several studies have indicated that vascular diseases have multi-factorial etiology that contributes to the risk of cardiovascular diseases. Therefore to be fully effective a preventive strategy must deal with multiple elements(Yusuf, 2001).

Nutrition and life-style are of particular importance epidemiological clinical and experimental studies have provided strong and consistent evidence that nutritional and dietary factors have an important role in the etiology of cardiovascular disease (Syllina, 1997).

People with high levels of high density lipoprotein in proportion to low density lipoprotein are less likely to develop coronary artery diseases than people with low (HDL). high concentration of (HDL) seems to protect against the development of Coronary artery disease. Experts believe that the cholesterol in high density lipoprotein doesn't become incorporated into the fatty plagues that develop in the liming of the artery wall, there is a large body of evidence that diets high in cholesterol and saturated fats raise the plasma cholesterol level. The average adult consumes about (140) gm of fat per day and about (500) mg of cholesterol (Nojiri, 2001)

The ration of saturated to polyunsaturated fatty acids is about (3:1) lowering the saturates to the level of the polvunsaturates effects the reduction in the dietan* cholesterol to about 200 to 300 mg (Meland, 2002).

Culland (2000) reported that (47%) of coronary heart disease deaths linked to high cholesterol levels. Excess body fat is a strong risk for coronary heart diseases that's one reason why it's important to bring the weight into the normal range.obesity imposes an increased burden when physical activity is undertaken. Since energy is expended to more the expended body mass because the storing excess calories in fat depots. In addition to the health hazard, there is a clear association between average length of life and body mass index (Frank, 2000).

The tradition in nutritional epidemiology has focused largely on the effects of single nutrients of food, and food consumed in combination and the combined effects of various nutrients and foods can be observed only when the entire eating pattern is considered. Analyzing food consumption as dietary pattern offers an additional dimension to examining the relations between diet and disease. (Gill, 2001).

Most people realise that aspects of their work and life - style can cause stress, while this is true, it is also important to note that some stress caused by food and drink.stress is the interaction between the demands or charges in life. So it is a normal part of everyday living and helps make life interesting. (Barnett,1997)

2. Significance of the Study

As one of the major public issue, atherosclerosis can be prevented through focus on the reduction of conventional risk factors and the dynamic of the relationship between such factors and their role relative to atherosclerosis. For that reason, clinical and experimental studies have provided strong and consistent evidence that nutritional and psychological factors have an important role in the etiology of Coronary heart disease, therefore the main emphasis in population based preventive strategies should be on nutrition and psychological risk factors (Horsten, 1999).

Similarly, illnesses affected by psychological factors, do not usually have psychiatric components, when psychological factors play a major role in the development of diseases. Psychological factors have a more modest contribution; one bodily response to stressors is typically adaptive (Frank, 2000).

On the another hand, The 1995 Dietary Guidelines emphasizes the importance of a person's overall dietary pattern, it moves away from discussion of individual foods, focusing instead on broader food choices that contribute to variety and moderation in the total diet. (Frank, 2000).

The integration of dietary pattern with psychological status, especially stress lead to make susptiable host to cardiovascular diseases, the researcher studied this phenomenon for the reason that, coping in life - style lead to healthy life (Frank Bltu;1999).

A number of illness had been observed as reactive to environmental and psychological factors, personality types or style contribute to the development and manifestation of the illness. (Dusseldrop, 1999).

3. Statement of the Study

Early diagnosed atherosclerosis for individuals under fourties and its relation to diet and stress

4. Objective of the Study

1. To find out the relationship between atherosclerosis and demographic characteristics of the study sample.
2. To determine the effect of dietary pattern upon incidence of atherosclerosis in the study sample.
3. To identify the effect of stress upon the incidence of atherosclerosis in the study sample.
4. To predict the incidence of atherosclerosis for normal clients.

5. Definition of Terms

5.1. Atherosclerosis

A narrowing of a blood vessel due to the accumulation of plague or atheroma resulting in a restriction of blood flow, Plague comprises irregular deposits of cholesterol ,Ca,CHO and other debris deposited within the intima and media of large and medium - sized arteries. (Hoeymans, 1996)

5.2. Dietary Pattern

It is a habitual dist - intake associated with life - style and effected culture - oriented norms, values and beliefs.(Liu ,1982.)

5.3. Life Events Stress

Stress is the interaction between the demands or changes in our life and our ability to adjust to them. Stress can be positive (happiness) or negative (anxiety), physical (exercise) or emotional (anxiety or happiness). It is a normal part of everyday living and helps make life interesting and meaningful. (Dusseldorp, 1999).

5.4. Type (A) Personality

It is defined as personality nonnative related style that is manifested with aggressiveness, ambition, competitiveness and preoccupation with deadline (Kaplan, 1993).

5.5. Occupational Stress

Job - related psychological disorder that emerge due to the nature of work and its place.(Dusseldorp,1999.)

6. Implication for Nursing

As far as the problem is emerging and causing death and disability study of such nature creates and initiates critical contribution to the nursing body of knowledge, particularly, in the area of community health in which preventive, epidemiological and rehabilitative measures can be employed.

The present study presents a framework for the community health nurse in order to apply the nursing process for better and more beneficial management of such risky dilemma.

2.0. Review of Literature
2.1. Facts about Coronary Heart Disease

Some seven millions American suffer from coronary heart disease (CHD), the most common form of heart disease. This type of heart disease is caused by a narrowing of the coronary arteries that feed the heart. (Howard, 1997)

Coronary heart disease is the number one killer of both men and women in the U.S. Each year, more than 500000 American dies of heart attacks caused by CHD. (Ross, 1993)

Many of these deaths could be prevented because CHD is related to certain aspects lifestyle, risk factors for CHD includes high blood pressure, high blood cholesterol, smoking, obesity, and physical inactivity all of which can be controlled. Although medical treatments for heart disease have come a long way, controlling risk factors remains the key to preventing illness and death from CHD. (Yusuf, 2001)

2.2. What is Coronary Heart Disease?

Like any muscle the heart needs a constant supply of oxygen arteries. When the coronary arteries become narrowed or clogged and cannot supply enough blood to the heart, the result is CHD,

If not enough oxygen - earning blood reaches the heart, the heart may respond \\itn pain caiTecf angina. The pain is usually felt in the chest or sometimes in the left arm and shoulder. (However, the same inadequate blood supply may cause no symptoms, a condition called silent angina. (Theorell, 1991)

When the blood supply is cut off completely the result is a heart attack. The part of the heart that does not receive oxygen begins to die, and some of the heart muscle may be permanently damaged. (Report of a WHO, 1995)

Coronary heart disease is a leading cause of death in the US 40% of all deaths. Not a major cause of death or illness until this century - people die of infection and had a healthier lifestyle (good diet and active) 500000 deaths / year, most premature and 1250000 nonfatal heart attacks. But there has been (50%) decline in these death rates since 1970. Heart attack recovery has improved and fewer

people are having MI, attributed to improve medical care and lifestyle changes. Less smoking better diet exercise, but is still the leading cause of death. (Robert, 2001).

2.3. Overview of Atherosclerosis as a Global Health Problem

Cardiovascular disease (CVD) is one of the leading causes of death in 32 of the developing region's 37 countries and areas; accounting for no fewer than 3 million deaths in the region each year, Age-adjusted mortality from CVD is now higher in many developing countries in the Region than in the developed countries (W.H.O, 1995). The prevalence of hypertension exceeds 10% in 19 countries and areas. Some populations in Pacific island countries are experiencing high prevalence of more than 20% of hypertension prevalence. Hypertension is an important and independent risk factor of ischemic heart disease, stroke, congestive heart failure and impaired renal function and it significantly contributes to the rates of stroke, coronary heart disease heart failure and renal failure. Morbidity and mortality due to ischemic heart disease are now rising in many developing countries in the Region. Stroke is responsible for numerous deaths and disabilities. In many countries in Asia and the Pacific stroke, especially hemorrhagic stroke, is more common than ischemic heart disease. In China, it has been estimated that there are 1.5 million new cases of stroke each year, and about 1 million deaths. At the next two decades dramatic changes will be seen in the health needs of the world's populations in the developing regions where four-fifths of the planet's people live (W.H. O, 1995).

No communicable diseases such as depression and heart disease are fast replacing the traditional enemies, such as infectious diseases and malnutrition, as the leading causes of disability and premature death. By the year 2020, no communicable diseases are expected to account for seven out of every ten deaths in the developing regions, compared with less than half today. Injuries both unintentional and intentional are also growing in importance and by 2020 could rival infectious diseases worldwide as a source of ill health. (W.H.O., 2002)

These changes are expected because of the rapid aging of the developing world's populations. As a population's birth rate falls, the number of adults relative to children increases, and the population's commonest health problems become those of adults rather than those of children. In China some other parts of Asia and Latin American this so-called "epidemiological transition" is already much further advanced than many public health specialists appreciate. In all regions the rapidity of change and the very large absolute numbers involved will pose serious challenges to health - care systems and force difficult decisions about the allocation of scarce resources. Yet, until now, many governments have lacked even the most basic data they needed to inform debate and to assess priorities for public health.

(Coulterman, 2002) stated that for the first time this gap has been filled with a landmark publication. Researchers at the Harvard school of Public Health and the World Health Organization, with more than 100 collaborators from around the world have produced a comprehensive internally consistent and comparable set of estimates of current patterns of mortality and disability from disease and injury for all regions of the world with projections to the year 2020. (HSPH and WHO, 2002)

"The number of deaths from heart disease may be falling but there is still a long way to go", this message from the British heart foundation according its annual statistics UK death rate from coronary heart disease have been falling since the 1970 with men aged (35-74), fell by (33%) between 1984 and 1994, but in Australia they were by (44%) over the same period for women the UK death rate fell by (29%) but the Australian rate fell by (45%) (Khor, 2001).

It is important to know that there is a wide range of severity for coronary artery disease some people have no symptoms at all, some have mild intermittent chest pain and some have more pronounced and steady pain, having a heart attack increases the probability of having anther because coronary artery- disease can progress over time (Hochner, 2002).

2.4. Gender

Men are at greater risk for heart diseases, and they occur at an earlier age in men than women, female hormones protect women in their younger years, after menopause, women's death rate from heart disease increases because of decreasing estogen levels (Gottesman, 2001).

It is often more difficult to identify heart disease in women. The typical symptom in men is chest discomfort, but in women, neck or abdominal discomfort may be more prevalent (Brunner, 1996)

Several prospective studies have shown that social ties predict survival after acute myocardial infarction, in those studies patients who lacked social support, lived alone or had not been married had an increased mortality risk following myocardial infarction (Brunner, 1996).

Additional social and demographic variables, such as living alone and marital status are available from the national longitudinal mortality study, household income and family size were assessed in a few studies and familial aggregation and cultural inheritance of social class were mentioned as a main variables in risk factors of atherosclerosis (Burr, 1998).

General problems with occupational classification include a usual lack of occupational histories so that downward mobility due to health problems cannot be ruled out substantial heterogeneity within occupation classifications (George, 2001).

Many studies have used measures of socioeconomic status that are based on characteristics of the areas in which people live, characteristics areas, block groups, zip codes, standard metropolitan statistical areas, that are used include income, education, proportion in poverty, occupational distribution crowding, housing conditions, relative equity of income distribution (Adekman, 1998).

Recent Studies

Recent studies provide clear and convincing evidence that psychosocial factors contribute significantly to the pathogenesis and expression of coronary artery disease (CAD). This evidence is composed largely of data relating CAD risk to 5 specific psychosocial domains: (1) depression, (2) anxiety, (3) personality factors and character traits, (4) social isolation, and (5) chronic life stress. Path physiological mechanism underlying the relationship between these entities and CAD can be divided into behavioral mechanism, whereby psychosocial conditions contribute to a higher frequency of adverse health behaviors, such as poor diet and smoking, and direct pathophsiological mechanism, such as neuroendorine and platelet activation. An extensive body of evidence from animal models (especially the cynomlogus monkey, Macaca fascicularis) reveals that chronic psychosocial tress can lead, probably via a mechanism involving excessive sympathetic nervous system activation, to exacerbation of coronary artery atherosclerosis as well as to transient endothelial dysfunction and even necrosis. Evidence from monkeys also indicates that psychosocial induces ovarian dysfunction, hypercortisolemia, and excessive adrenergic activation in premenopausal females, leading to accelerated atherosclerosis. Also reviewed are data relating CAD to acute stress and individual differences in sympathetic nervous system responsively, New technological and research from animal models demonstrate that acute stress triggers myocardial ischemia, promotes arhythogenesis, stimulates platelet function, and increase blood viscosity through hem concentration. In the presence of underlying atherosclerosis (e.g., in CAD patients), acute stress also causes coronary vasoconstriction. Recent data indicate that the foregoing effects results, at least in part, from the endothelial dysfunction and injury induced by acute stress, Hyperresponsivity of the sympathetic nervous nervous system, manifested by exaggerated heart rate and blood pressure responses to psychological stimuli, is an intrinsic characteristic among some individuals. Current data link sympathetic nervous system hyperresponsivity to accelerated developing of carotid atherosclerosis in human subjects and to exacerbated.(Rozanski et. al., 2000)

Design and Methodology
Methodology

This chapter is concerned with the presentation of all the methodological principles which are outlined as follows:

3.1. Design of the Study
Descriptive design using a prospective (case - control) approach was carried throughout the present study for the period of July 2001 to February 2003

3.2. Setting of the Study
The study was conducted at the Iraqi Center for Heart Diseases and Ibn Al-Hafees Hospital for Cardiovascular Diseases and Heart Surgery in Baghdad. Selection of these centers was justified due to the following reasons:

1. They were considered the main heart surgery institutions.
2. They provided research - oriented facilities.
3. They presented cooperation for researchers more others

3.3. Sample of the Study
Purposive sample of (352) patients was selected aged under forties years old, the sample composed male and female. These patients had attended the outpatient clinics at these centers for diagnosis and treatment of almost all cardiovascular diseases.

Identification of subjects was made through review of the patient's records. Pool of patients was created and selection was initiated. Participants were a signed to two groups; (182) cases and (170) controls.

3.4. Study Instrument
Interview -format questionnaire was designed and constructed to measure the phenomenon and related issues underlying the study. The questionnaire was generated and emerged as result to clinical background in the area, review of related literature and experts recommendations and suggestions .

The questionnaire was presented into (7) main parts. Each one was concerned with the measurement of issues related to the phenomenon of interest. These parts were presented as follows:

3.4.1. Personal Characteristics Sheet
It is comprised of (9) items which included patient identification number, age, sex, marital status, educational status occupation, family type and family size.

3.4.2. Medical History
Such part was presented through (3) items that included body mass index (BiYJJ). family history of cardiovascular diseases and Angiography results.

3.4.3. Typical Daily Eating Pattern
This part was interested with the measurement of the subject's main meals caliors/day (breakfast, lunch and dinner) by measure the amount of food in grams to caliors.

3.4.4. Dietary Pattern
This part consisted of (10) items to measure the frequency of food - intake of the subjects. Such frequencies were rated as ahvays, sometimes and never; and second as 3 for always, 2 for sometimes and 1 for never (Polit and Hungler, 1999).

3.4.5. Characteristic of Type "A" Personality
It is concerned with the measurement of the type "A" personality indicators through (21) item. These items were rated as ahvays, sometimes and never: and scored as 3 for always, 2 for sometimes and 1 for never by using universal scales from (Haber, J.: Comprehensive Psychiatric Nursing)

3.4.6. Social Readjustment
It is concerned with the measurement of the subjects social readjustment that of the subjects social readjustment that resulted after exposure to stressful life events scores of less than 150 indicated that 37% of having chance of illness within the next 2 years; scores of (150-300) presented that (51%) of having chancel of illness through the next 2 years; and scores of more than 300 revealed that (S0°b) of having illness through the next 2 years.

3.4.7. Occupational Stress
This part measured the degree of hardiness that the subjects may experience due to their job performance through (10) items. It was rated and second as 3 for always, 2 for sometimes and 3 for never (Polit and Hungier, 1999).

3.4.6. Social Readjustment
It is concerned with the measurement of the subjects social readjustment that of the subjects social readjustment that resulted after exposure to stressful life events scores of less than 150 indicated that 37% of having chance of illness within the next 2 years; scores of (150-300) presented that (51%) of having chancel of illness through the next 2 years; and scores of more than 300 revealed that (80%) of having illness through the next 2 years.

3.5. Data Collection
Data were collected through the utilization of the questionnaire as an instrument of such data collection and the application of the structured interview as mean of data collection.

3.6. Pilot Study
The pilot study *was* conducted to determine the reliability of research questionnaire which was used to identify the patients understanding of instrument items, obtain the preliminary estimates of time required for each patient interview process and determine the instruments reliability by choosing twenty patients from Iraqi Center for Hear: Diseases and Ibn Al-Nafees Hospital for Cardiovascular Diseases and Heart Surgery in Baghdad.

3.6.1. Validity of the Questionnaire
Content validity was determined through the use of panel of experts, there were (7) faculty members from the College of Nursing, University of Baghdad, *(3)* faculty members from the College of Medicine. University of Baghdad.(2) psychologists from the College of Education. University of Baghdad, (5) nutritionists from the Nutritional Research Institute members from toe Saddam, they were asked to review the questionnaire.

Findings of the Study
Basic Information and Results

The sample of the study consisted of (352) cases which Underwent coronary angiographic test and/or coronary ballooning for coronary atherosclerosis, (182) of them were Positively diagnosed as having coronary atherosclerosis, while (170) had no coronary diseases considered as controls group. The majority of positive cases (137)(38.92%) were males, and (45)(12.78%) were females, in the control group (112) (65.88%) were males and (5S)(34.12%)were females. the distribution of their educational

background was skewed toward low education standard primary schools graduates, (86%) while those, with advanced educational standard, comprise (15.9%).

Table 1:   Distribution of the cases according to their age

		Positive cases		Negative cases	
Item	Age		%	f	%
1	20-22	19	10.4%	16	9.4%
2	23-25	25	13.7%	23	13.6%
3	26-28	22	12.1%	20	11.7%
4	29-31	15	8.2%	18	10.6%
D	32-34	49	27%	42	24.7%
6	35-37	30	16.6%	33	19.4%
	38-40	22	12%	8	10.6%
	Total	182	100 j	170	100

Distribution of the cases and the controls according to their age indicated that most of the cases and the controls were (32-34) years old and they accounted for (27%) of the controls.

Groups	N		M	S	T	Df	Sig j
positive	182	1 3	1.66	6.05	-.76	350	0.05
negative	170		32.08	14.29			

T-critical = 1.645

Difference was depicted between the positive cases and the controls with regard to their age

Table 2:   Distribution of the positive and negative cases relative to their gender

pos, Sex		rive Cases	j negative cases	
f		J		f
Male	137	75.3	112	65.9
Female	45	24.7 j	58	24.1
182		100% j	170	100% j

Table 3:   Distribution of the positive cases and control group regarding to their marital status

Marital status	positive cases		controls group	
	f	%	f	%
married	31	17	27	15.9
Single	90	49.5	78	45.9
Widowed	25	13.7	8	4.7
Divorced	14	7.7	27	15.9
Separated	22	12.1	30	17.6
L82 100		170	100	

The data analysis indicated that the higher proportions of the cases and controls accounted for single (49.5%) and (45.9%) respectively.

The lower proportion of the cases was (7.7%) for divorced and that of the controls was (4.7%) for widowed.

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