Research Article

Metabolic Syndrome among Tanta Faculty of Medicine Administrative Employees

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Abstract

Objectives: The aim of study was to estimate the prevalence of metabolic syndrome using the definition proposed by the National Cholesterol Education Program (NCEP) among Tanta faculty administrative employees to recommend a certain measure for its prevention. **Methods:** A cross sectional survey study was conducted on 239 Tanta faculty administrative employees. **Results:** More than two thirds of the study group aged > 40 years. Females constituted about two thirds. 30.5% of study employees suffered from metabolic syndrome. Female, aged > 40 years, overweight and obese, physically inactive, current cigarette smoking, hypertensive, diabetic, dyslipidemic with abdominal obesity employees had statistically significant risk of metabolic syndrome. **Conclusion and Recommendation:** The study recommended educational intervention for lifestyle modification for all at risk employees with monitoring and managing risk profile.

Key words: metabolic syndrome, adults, risk

INTRODUCTION

Metabolic syndrome represents the presence of a combination of interrelated risk factors, including central obesity, insulin resistance, dyslipidemia and hypertension.[1,2] Subjects with metabolic syndrome have substantially increased risk for developing type 2 diabetes mellitus and cardiovascular diseases (CVD).[3,4] Also, the overall mortality is higher among patients with metabolic syndrome, particularly the mortality associated with CVD. [5] This increase in CVD risk appears to be independent of other important and potentially confounding factors such as smoking and elevated low-density lipoprotein cholesterol (LDL-C) levels.[3] The adverse effects of metabolic syndrome are manifested across the whole spectrum of blood glucose level status (i.e., patients having normal blood glucose levels, those having impaired fasting blood glucose and those with frank diabetes mellitus).[3-5]

Worldwide, published studies on the prevalence of metabolic syndrome are limited. Among Arab populations, metabolic syndrome has not been widely studied, but the available data suggest that it is an increasingly common problem.[6-11] There are several working definitions for metabolic syndrome proposed by The World Health Organization, the 2001 National Cholesterol Education Program Adult Treatment Panel III (NCEP ATPIII), European Group for the Study of Insulin Resistance (EGIR), and the International Diabetes Federation.[1] The existence of different definitions makes it difficult to compare data from around the world and between different populations.[12,13] However, The NCEP description of metabolic syndrome is considered to be the most applicable tool for clinical and epidemiological practices.[1] Administrative employees of the Tanta Faculty of Medicine are a group of community that may be exposed to the risk of metabolic syndrome due to several risk factors as overweight, diabetes and hypertension due to sedentary and feeding life style. They are easy to catch and to follow up, especially when a preventive program applied for these risk factors to prevent bad consequences. So, the current study aims to estimate the prevalence of metabolic syndrome using the definition proposed by NCEP among Tanta faculty administrative employees to recommend certain measures for its prevention.

METHODS

Design, Setting and Study Population

Two hundred and thirty nine faculty administrative employees were enrolled in a cross sectional survey conducted in Tanta faculty of medicine, Egypt during the period between first of October 2012 to end of December 2012.

Inclusion criteria

Administrative Tanta faculty of Medicine employees aged 20 years and above willing to participate in the study.

Exclusion criteria

Pregnant women, patients suffering from chronic diseases (coronary heart diseases, liver disease with liver cell failure, hypertension and diabetes) and employees not willing to participate.

To improve participation, a timetable was prepared and announced to define specific appointment for each staff related to certain department. Although participation was voluntary, staff members were actively encouraged to go through the clinical screening process to identify risk for metabolic syndrome. An invitation letter was sent to each department explaining the purpose of the study and its benefit to health. The letter included a suggested appointment date and time. Those not showing up for their appointment were contacted by phone and rescheduled for another appointment.

Definition of Metabolic Syndrome

According to the NCEP (Adult Treatment Panel III) report [13], a person is considered to have metabolic syndrome if he has any three of the following:

1. Abdominal obesity: waist circumference > 102 cm in men and > 88 cm in women
2. Hypertriglyceridaemia: Triglyceride (TG) level ≥ 150 mg/dl (1.69 mmol/l).
3. Low high-density lipoprotein cholesterol (HDL-C) level: < 40 mg/dl (1.04 mmol/l) in men and < 50 mg/dl (1.29 mmol/l) in women.
4. High blood pressure: ≥ 130/85 mmHg.
5. High fasting glucose: ≥ 110mg/dl (6.1 mmol/l).

Data Collection and Measurements

Each participant was interviewed using a structured questionnaire that recorded his age, sex, educational level, history of treatment of hypertension, sport practice, smoking habits and family history of coronary heart diseases. Pregnant women, employees suffering from chronic diseases and employees not willing to participate were excluded from the study. Sport practice was classified into good practice (employees did vigorous exercise ≥ three times per week for about 60 minutes and > 30 minutes of moderate physical activity most days of the week), Accepted practice (employees did vigorous exercise < three times per week for about 60 minutes and > 30 minutes of moderate physical activity most days of the week) and poor (employees did no vigorous activity or irregular practice of vigorous exercise for < 60 minutes/week and < 30 minutes of moderate physical activity most days of the week).[14]

After the interview, the participants' weight and height were assessed using weight and height scales. The weight scale was placed on a hard floor surface and the scale was balanced with both sliding weights at zero and the balance bar was aligned. The participants were asked to remove their heavy outer garments and shoes and stand in the centre of the platform. Participants were asked to remove their shoes, heavy outer garments, and hair ornaments for height measurement. The participants were asked to stand upright with his/her back to the height ruler with the back of the head, back, buttocks, calves and heels touching the ruler; feet together and the top of the external auditory meatus (ear canal) level with the inferior margin of the bony orbit and the participants were asked to look straight. The body mass index was calculated by dividing body weight in kilograms by the square height in meter, where less than 18 was considered underweight, 18 to 25 was considered average, above 25 to less than 30 was considered overweight, 30 to less than 35 was considered mild obesity, from 35 to less than 40 was considered moderate obesity and 40 and above was considered massive obesity.[15] Waist circumference was assessed using a meter measurement scale in cm. Also, the participants' blood pressure was assessed by using a standard mercury sphygmomanometer after the subject had been seated for at least 5 minutes interval. Two readings were taken with 5 minutes interval and their mean was recorded. Hypertension was diagnosed when systolic blood pressure was ≥ 140 mm Hg and diastolic blood pressure ≥ 90 mm Hg.[16]

For biochemical investigations, a venous blood sample was taken (throughout the clinical pathology department of Tanta university hospital) in the morning after a twelve hour fasting for the determination of total cholesterol, high-density lipoprotein concentrations, triglyceride and fasting blood sugar. Hypercholesterolemia was diagnosed when total cholesterol level was more than 200 mg/dl, and high- density lipoprotein was abnormal when HDL was less than 40 mg/dL in men and < 50 mg/dL in women.[17] Diabetes mellitus was diagnosed when fasting blood glucose level was ≥ 126 mg/dl.[15]

Ethical Considerations

Verbal consent was taken from all participants in line with the Ethics protocol of medical research. The raw data were treated with strict confidentiality and used only for research purposes. Participants informed personally about the results of their clinical examination and laboratory investigations.

Data Analysis

The questionnaires were coded and entered into an electronic database. Data analysis was carried out using Statistical Package for Social Sciences (SPSS) version 20. Frequency distributions with numbers and percentages of all categorical variables were produced. Comparisons were done between study groups according to socio-demographic and clinical profiles using 2-sided independent t-test, chi-square test or likelihood test. The independent variables considered were age, sex, smoking condition, physical activity, body mass index, family history of chronic diseases, systolic and diastolic blood pressure, fasting blood sugar, high density lipoprotein, triglycerides and total serum cholesterol. The results were considered significant when p < 0.05 level.

The power of the test for a single proportion of metabolic syndrome was calculated using Minitab statistical program version 16 for the study population (239 employees) and it was found to be 82.58%, putting into consideration that study probability of metabolic syndrome was 30.5% and alternative probability was 39.3% from previous research.[11]

RESULTS

The target group included 239 employees with a response rate of 83.27%. (The response rate was calculated after subtracting 33 employees suffering from coronary heart disease, hepatic disease, hypertension, diabetes and pregnancy out of 320 employees).

84 were males and 155 females, with age ranging from 25 to 59 years. Our study found that females constituted 64.85%, while males constituted 35.15%. The mean age of study females (44.36 ± 14.6 years) was statistically lower than males (52.21± 9.89 years). More than one-half (57.3%) and more than one-third (36.0%) of the study group were secondary and university educated respectively, without significant difference between males and females regarding education. More than three-fifths (60.6%) of study females were ≥ 40 years old compared to 85.7% of study males, with a statistically significant difference between them. Employees suffering from overweight were higher among males (33.3%) than among females (20.6%); while obesity was higher among females (47.7%) than males (8.4%) with statistically significant difference. More than one-fourth (28.6%) of study males were current cigarette smokers compared to zero percent among females with significant difference between males and females regarding smoking status. The majority (86.2%) of the study group were physically inactive, while only 2.1% of them had good practice without significant difference between males and females. The mean waist circumference of females (96.62 ± 10.72 cm) was insignificantly higher than males (95.07 ± 8.01 cm). There were no statistically significant differences between males and females regarding systolic and diastolic blood pressure, fasting blood sugar, total cholesterol and HDL. The mean level of triglyceride was significantly higher among females (164.77 ± 40.99) than males (151.42 ± 22.80) (table 1).

Table 1: Distribution of personal and medical data according to sex

Personal and medical data		Sex		Statistical tests	p
		Females (mean ± SD)	Males (mean ± SD)		
Age in years		44.36 (14.60)	52.21 (9.89)	Mann whiteny test =4.92	0.000
Waist circumference in cm		96.62 (10.72)	95.07 (8.01)	t = 1.26	0.207
Systolic blood pressure mmHg		129.51 (15.04)	130.05 (15.11)	t = 0.26	0.79
Diastolic blood pressure mmHg		84.48 (10.17)	84.28 (7.68)	Mann whiteny test =0.16	0.86
Fasting blood sugar mg/dL		109.22 (27.02)	107.61 (28.64)	t = 0.43	0.66
Total cholesterol mg/dL		207.29 (44.22)	199.16 (27.25)	t = 1.75	0.08
Triglyceride mg/dL		164.77 (40.99)	151.42 (22.80)	Mann whiteny test =3.23	0.001
HDL mg/dL		49.0 (4.63	47.72 (5.63)	t = 1.77	0.079
	Categories	No =155 (100%)	No=84 (100)	Total 239 (100%)	Chi-square test	
Age groups in years	<40	61 (39.4)	12 (14.3)	73 (30.5)	16.13	0.000
	≥40	94 (60.6)	72 (85.7)	166 (69.5)		
Educational levels	Literate	10 (6.5)	6 (7.1)	16 (6.7)	0.11	0.94
	Secondary	90 (58.1)	47 (56.0)	137 (57.3)		
	university	55 (35.4)	31 (36.9)	86 (36.0)		
Body mass index	Average	49 (31.6)	49 (58.3)	98 (41.0)	52.94	0.000
	Overweight	32 (20.6)	28 (33.3)	60 (25.1)		
	Mild obese	12 (7.7)	5 (6.0)	17 (7.1)		
	Moderate obese	59 (38.1)	2 (2.4)	61 (25.5)		
	Severe obese	3 (1.9)	0 (0.0)	3 (1.3)		
Smoking condition	Non smokers	67 (43.2)	44 (52.4)	111 (46.4)	91.76	0.000
	Passive	88 (56.8)	11 (13.1)	99 (41.4)		
	Ex-smokers	0 (0.0)	5 (6.0)	5 (2.1)		
	Current	0 (0.0)	24 (28.6)	24 (10.0)		
Sport practice	No	135 (87.1)	71 (84.5)	206 (86.2)	4.74	0.192
	Imperfect	15 (9.7)	5 (6.0)	20 (8.4)		
	Accepted	3 (1.9)	5 (6.0)	8 (3.3)		
	Good	2 (1.3)	3 (3.6)	5 (2.1)		

Metabolic syndrome was significantly higher among females (38.7%) than males (15.5%). About one half of employees aged $\geq$ 40 years suffered significantly from metabolic syndrome while lower age employees were not suffering from it. The frequency of metabolic syndrome was insignificantly affected by level of education. Average body weight employees suffered less frequent from metabolic syndrome than overweight, mildly obese, moderately obese and massive obese ones (46.7%, 29.4%, 55.7% and 100.0% respectively). Metabolic syndrome was significantly more frequent among physical inactive employees (35.0%) than employees with accepted (0.0%) and good (0.0%) sport practice. respectively. The frequency of metabolic syndrome was significantly higher among current smokers, passive smokers, and ex-smokers (16.7%, 60.6% and 60% respectively) than non-smokers (5.4%). Metabolic syndrome by its definition was significantly higher among patients suffering from an abnormal increase of waist circumference, hypertension and diabetes (53.0%, 91.9% and 91.5%) than normal ones (2.8%, 3.0% and 15.6%) respectively. The frequency of metabolic syndrome was significantly higher in patients suffering from dyslipidemia due to hypercholesterolemia, low HDL and hypertriglyceridemia (56.0%, 58.5% and 35.4%) than normal ones (16.8%, 24.7% and 0.0%) respectively (table 2).

Table 2: Metabolic syndrome according to personal and medical data

Socio-demographic characteristics	Categories	Non metabolic	Metabolic syndrome	Total	Statistical test	p
Sex	Females	95 (61.3%)	60 (38.7)	155 (100.0)	$X^2 = 13.86$	0.000
	Males	71 (84.5%)	13 (15.5)	84 (100.0		
Age in years	<40 years	73 (100.0)	0 (0.0)	73 (100.0)	$X^2 = 46.22$	0.000
	>40 years	93 (56.0)	73 (44.0)	166 (100.0)		
Educational levels	Literate	10 (62.5)	6 (37.5)	16 (100.0)	$X^2 = 2.48$	0.28
	Secondary	91 (66.4)	46 (33.6)	137 (100.0)		
	University	65 (75.6)	21 (24.4)	86 (100.0)		
BMI	Average	95 (96.9)	3 (3.1)	98 (100.0)	Likelihood ratio=80.07	0.000
	Overweight	32 (53.3)	28 (46.7)	60 (100.0)		
	Mild obese	12 (70.6)	5 (29.4)	17 (100.0)		
	Moderate obese	27 (44.3)	34 (55.7)	61 (100.0)		
	Massive obese	0 (0.0)	3 (100.0)	3 (100.0)		
Sport practice	Non	134 (65.0)	72 (35.0)	206 (100.0)	Likelihood ratio=19.59	0.000
	Imperfect	19 (95.0)	1 (5.0)	20 (100.0)		
	Accepted	8 (100.0)	0 (0.0)	8 (100.0)		
	Good	5 (100.0)	0 (0.0)	5 (100.0)		
Smoking status	Non	105 (94.6)	6 (5.4)	111 (100.0)	Likelihood ratio=86.36	0.000
	Passive	39 (39.4)	60 (60.6)	99 (100.0)		
	Ex-smokers	2 (40.0)	3 (60.0)	5 (100.0)		
	Current	20 (83.3)	4 (16.7)	24 (100.0)		
Waist circumference	Average	104 (97.2)	3 (2.8)	107 (100.0)	$X^2 = 70.27$	0.000
	Abnormal increase	62 (47.0)	70 (53.0)	132 (100.0)		
Blood pressure	Normotensive	160 (97.0)	5 (3.0)	165 (100.0)	190.15	0.000
	Hypertensive	6 (8.1)	68 (91.9)	74 (100.0)		
Fasting blood sugar	Non-diabetic	162 (84.4)	30 (15.6)	192 (100.0)	102.43	0.000
	Diabetic	4 (8.5)	43 (91.5)	47 (100.0)		
Total cholesterol	Normal	129 (83.2)	26 (16.8)	155 (100.0)	39.41	0.000
	High	37 (44.0)	47 (56.0)	84 (100.0)		
HDL	Normal	149 (75.3)	49 (24.7)	198 (100.0)	18.28	0.000
	Low	17 (41.5)	24 (58.5)	41 (100.0)		
Triglyceride	Normal	33 (100.0)	0 (0.0)	33 (100.0)	16.83	0.000
	High	133 (64.6)	73 (35.4)	206 (100.0)		

Figure (1) shows the distribution of personal and medical variables among study employees. It showed that the majority of study employees (59.0%) were overweight and obese; 55.2% of them had central obesity. One-tenth of study employees were current smokers. Most of study employees (86.2%) were not practicing sport at all. About one-third (31.0%) of study employees suffered from hypertension. Slightly less than one-quarter (23.4%) of them suffered from dyslipidemia due to high total cholesterol level, while only 17.2% of them suffered from dyslipidemia due to lower high density lipoprotein. About one-third (33.1%) of them suffered from hypertriglyceridemia. About one-fifth (19.7%) of the study group suffered from diabetes. The frequency of metabolic syndrome among our study was 30.5%.
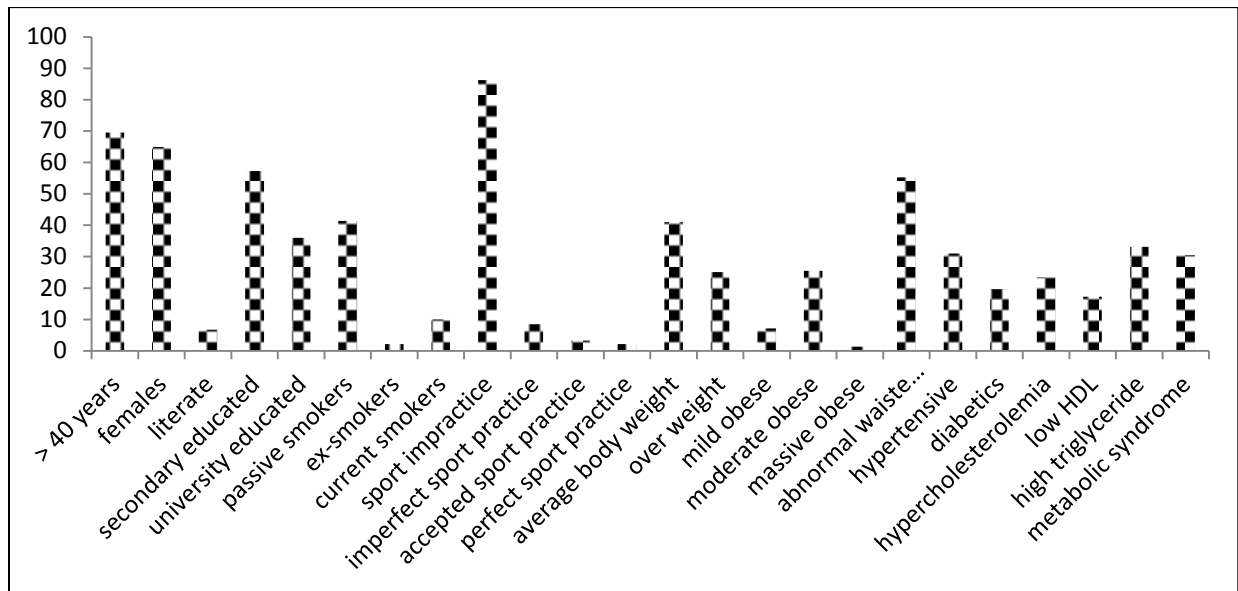
Figure 1: Distribution of personal and medical variables among study employees

Figure (2) shows that more than one-third (35.98%) of the study group had no risk factors of metabolic syndrome, while 24.69%, 8.79%, 18.83%, 10.04% and 1.67% had one, two, three, four and five risk factors respectively according to NCEP definition.
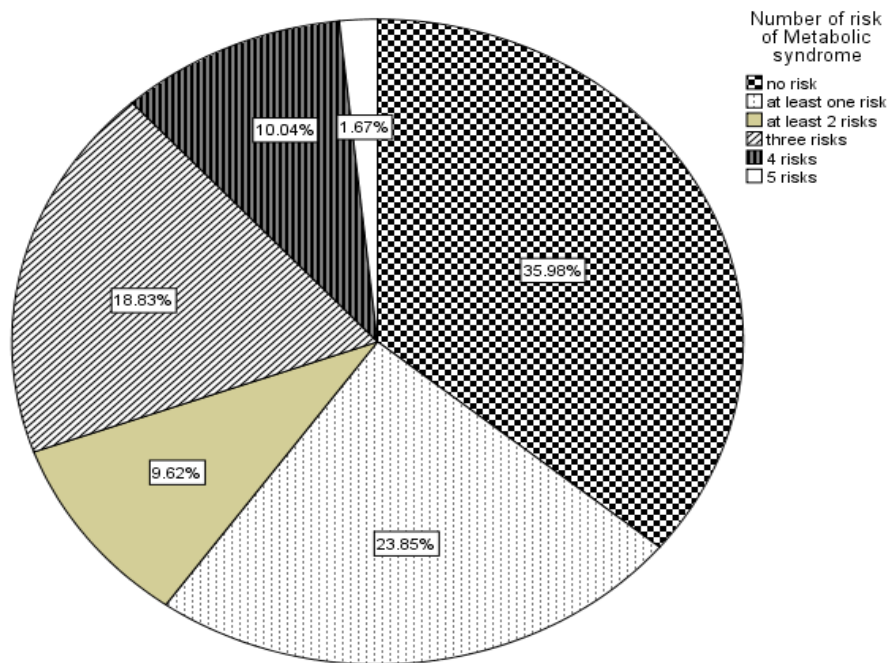

Figure 2: Number of metabolic syndrome risk factors according to NCEP definition.

DISCUSSION

The current study revealed that males constituted about one third of the study group, while females constituted about two thirds. About three fifths of them were overweight and obese, while more than half had central obesity as measured by waist circumference. Female sex distribution was higher in our study population than Egyptian population

profile (nearly equal male and female among age group between 25 -55 years) while weight distributions in our study was nearly similar to the Egyptian population profile declared 2013.[18]

More than one-half and more than one-third of our study group were secondary and university educated respectively. The Economist (2009) revealed that about 30% of all Egyptians in the relevant age group are university educated. However, only half of them graduated.[19] UNESCO Institute of Statistics, (2007) revealed that 77.3% of Egyptian students completing preparatory stage are estimated to be enrolled in secondary education.[20] Administrative work in faculty of medicine included unskilled workers (cleaners), semi-unskilled (photocopier), semi-skilled (laboratory assistants and clerks), skilled (accountants) and professional (top managers).

Our series showed that one tenth of the study employees were current smokers and all of them were males. In the past few years, Egypt Global Adult Tobacco Survey (2012) revealed that smoking in Egypt reached an all-time high rate with an estimated ten million people, regularly using tobacco products. About one-fifth of the Egyptian population used some form of tobacco product.[21] Surveillance of non-communicable diseases in Egypt (2006) found that the prevalence of current smoker rate in Egypt was 34.6% and 0.7% among males and females respectively with an overall prevalence of 18%.[22] Low frequency of smoking condition in our study can be explained based upon that female distribution is high compared to Egyptian population as smoking is prevailing among males more than females and also, adolescent age group was not included in study population. Hajat (2010) found that 24% of United Arab Emirates men were current smokers throughout the self-report.[23]

Our series showed that about three fifths of study employees were overweight and obese. About one fifth of study females were overweight compared to one third of study males. Obese females constituted about one half compared to less than one tenth of obese males and the difference between males and females regarding body mass index was found to be statistically significant. In Egypt, Ellabany and Abdel - Nasser (2006) reported that 66% of the total population was overweight and obese, while obesity constituted 30.3%. They revealed that obesity rate was higher among females than males (39% and 21.8% respectively) while the overweight rate was higher among males than females (38.2% and 33.2%, respectively).[22] In the UAE, Hossain et al., (1998) found that 51% of the men were overweight and 18% were obese.[23] Prevalence of obesity in Arab countries is different from country to another one, where obesity prevalence was 30.8% in Oman, 40.8% in Qatar and 41.5% in Gaza and West Bank which is an extremely high prevalence of obesity. In Oman (2000) the

prevalence of overweight and obesity was 46.2% for males and 49.5% for females with a crude prevalence of 47.9% for the whole sample.[24]

The current study found that most of studied employees (86.2%) did not practice sports at all and the difference between males and females was statistically insignificant. However, in Egypt, Khalid (1995) revealed that women were less active compared to men in certain areas. Physical and cultural barriers to physical activity have been reported among women in Egypt.[25]

The present study revealed that less than one-third of study employees suffered from hypertension with statistically insignificant difference between males and females. In Egypt, Ellabany and Abdel -Nasser (2006) found that 26.7% of Egyptians were hypertensive and hypertensive rates nearly were the same among males and females (26.3% and 27.1% respectively).[22] However Sanisoglu et al., (2006) in Turkey found that the prevalence of hypertension was higher in females than males.[26] Differences in lifestyle, such as dietary habits, socioeconomic and environmental factors even the salt content of water can contribute to variations of the prevalence of hypertension.[27]

The current series found that about one-third and slightly less than one-quarter of study group suffered from dyslipidemia due to high total cholesterol or high triglyceride levels, respectively while only 17.2% of them suffered from dyslipidemia due to lower high density lipoprotein. Data from the national survey of lipid profiles indicate that the overall proportion of Egyptian adults with high total cholesterol is 46.0% and high triglycerides 16%.[28] Ellabany and Abdel-Nasser (2006) revealed that 19.4% of Egyptians suffered from dyslipidemia. They found that 23.1% of females and 15.7% of males suffered from hypercholesterolemia above 200 mg/dL.[22] In the UAE, Hossain et al., (1998) found that high levels of total blood cholesterol were detected in 35% of men.[23] In Lebanon, Nasreddine et al., (2010) found that low high-density lipoprotein cholesterol (HDL) levels were discovered in 66.7%.[29] However, in Iran, Gharipour et al., (2005) found that women had the highest prevalence of low HDL cholesterol concentration. The most important is the ability of high density lipoprotein to drive a process called "reverse cholesterol transport: The higher your HDL, the greater your capacity to remove cholesterol and prevent dangerous blockages from developing in your blood vessels.[30]

Our study showed that about one-fifth of study group suffered from diabetes. In agreement with our study, diabetes prevalence was 20.0% in urban Egypt.[31] In Egypt, Ellabany and Abdel-Nasser (2006) revealed that 6.2% and 8.2% of Egyptian males and females, respectively suffered from diabetes with an overall rate of 7.2%.[22] The difference in frequency of

diabetes between our study and other study is due to difference in socio-demographic profiles.

Alzahrani et al., (2012) found that only one-third of the participants had normal weight. Central obesity based on waist circumferences was noted in 21% of males and 22% of females. Low high-density lipoprotein showed the highest prevalence (29%) followed by high triglyceride (24%). About 14% of participants had impaired fasting blood glucose. Only 6% had high blood pressure.[32]

Metabolic syndrome was significantly higher among patients suffering from an abnormal increase of waist circumference, hypertension and diabetes than normal ones respectively. The frequency of metabolic syndrome was significantly higher in patients suffering from hypercholesterolemia, low HDL and hypertriglyceridemia than normal ones respectively.

Our results revealed that metabolic syndrome was significantly higher among females than males. Gharipour et al., (2013) found the same results. They found that the overall prevalence of high blood pressure, diabetes mellitus, and dyslipidemia was higher in the group with metabolic syndrome. Increased body mass index, systolic and diastolic blood pressure, blood glucose, total serum cholesterol, and serum triglycerides was significantly higher in both men and women with metabolic syndrome compared to subjects without metabolic syndrome.[33]

The frequency of metabolic syndrome was significantly higher among current smokers, passive smokers, and ex-smokers than non-smokers. Weitzman et al., (2005) revealed that tobacco smoke contributes to insulin resistance which led to the obesity and diabetes.[34]

The frequency of metabolic syndrome among our study group was 30.5%. Nearly similar results were attained by other Saudi and Egyptian studies.[35,36] More than one third of the study group had no risk factors of metabolic syndrome while 24.69%, 8.79%, 18.83%, 10.04% and 1.67% had one, two, three, four and five risk factors respectively according to NCEP definition.

Alzahrani et al., (2012) found that the prevalence of metabolic syndrome was 21%. They revealed that more than three-quarters of the respondents had > 1 component of metabolic syndrome.[32] Third National Health and Nutrition Examination Survey during period between 1988 and 1994 found that the prevalence of metabolic syndrome (using the NCEP–ATP III criteria) varies from 16% of black men to 37% of Hispanic women.[37] A survey in Turkey reported a prevalence of 33.9% for MS, with a higher prevalence in women (39.6%) than in men (28%).[38]

Limitations of the study

Our study was done upon special group (Administrative employees of Tanta Faculty of medicine). There were some differences between our study population and the total population as sex difference. The study was restricted to the age group between 18 and less than 60 years and administrative jobs. The condition needs further community-based in-depth study to determine the risk factors that lead to the metabolic syndrome.

CONCLUSION AND RECOMMENDATIONS

The present study concluded that 30.5% of study employees suffered from metabolic syndrome. Females, aged > 40 years, overweight and obese, physically inactive, current cigarette smoking, hypertensive, diabetic, dyslipidemic with abdominal obesity employees had statistically significant risks of metabolic syndrome. The study recommended educational intervention for lifestyle modification for all risk employees with monitoring and managing risk profile.

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