

Original Research Article

Evaluation of Eating Disorders In Elderly With Metabolic Syndrome

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Abstract

Eating disorders are a heterogeneous group of complicated psychological disorders that manifested by abnormal ingestion behaviors like bulimia nervosa and binge eating disorder which result in increased risk of morbidity, or maybe mortality. Metabolic syndrome frequently increase with age, creating its diagnosis is necessary due to increased risk of many diseases. Certain eating behaviors were related to metabolic syndrome.

To determine the prevalence of *metabolic syndrome* in elderly and to explore eating disorders in elderly persons with metabolic syndrome.

Crosssectional study including (175) patients over 60 years old in Babylon province , Iraq , from August 2016 to February 2017. Data collection tools included: Structured questionnaires, anthropometric measurement and Biochemical investigations.

From a total sample (175), 81(46%) of the elderly has been diagnosed as metabolic syndrome, 28 out of 81(35%) of them had eating disorders ,11 (39%) met criteria of bulimia nervosa and 17(61%) reported Binge eating. There was significant association between two groups "with and without eating disorders " regarding age ,gender , marital state and educational level

Prevalence of *Eating Disorders* in elderly with metabolic syndrome is high . binge eating is more common than bulimia nervosa.

Key Words: older adults , metabolic syndrome, eating disorders.

تقييم اضطرابات الاكل لدى كبار العمر المصابين بمتلازمة الايض الغذائي

الخلاصة

اضطراب الاكل هو مجموعة من الاضطرابات النفسية ويوصف بوجود عادات غير طبيعية في الأكل، وذلك من حيث تناول كميات زائدة عن الحاجة مثل النهام العصبي (النهم) واضطراب الاكل القهري مؤدي الى مشاكل صحية كثيرة قد تؤدي الى الوفاة. متلازمة الايض الغذائي تزداد مع تقدم العمر مما يجعل تشخيصها مهم لعلاقتها بعدة امراض، بعض اضطرابات الاكل لها علاقة مع متلازمة الايض الغذائي. معرفة مدى انتشار متلازمة الايض الغذائي لدى كبار العمر ومعرفة مدى انتشار اضطرابات الاكل لدى كبار العمر الذين يعانون من متلازمة الايض الغذائي.

اجريت دراسة مقطعية شملت ١٧٥ مريض اعمارهم فوق ٦٠ سنة في محافظة بابل-العراق، للفترة من شهر آب ٢٠١٦ الى شهر شباط ٢٠١٧. تم جمع المعلومات من المشاركين عن طريق استمارة استبيان واخذ القياسات البشرية والتحليل المختبرية .

من مجموع العينة البالغ ١٧٥، ٤٦% من كبار العمر المشمولين بالدراسة مصابين بمتلازمة الايض الغذائي ومنهم ٣٥% يعانون من اضطرابات الاكل. منهم ٣٩% يعانون من النهام العصبي (النهم) و ٦١% يعانون من اضطراب الاكل القهري. وسجلت علاقة احصائية بين مجموعة مصابة باضطرابات الاكل مع مجموعة غير مصابة باضطرابات الاكل في ما يخص العمر، الجنس، الحالة الاجتماعية والمستوى الثقافي. ان معدل انتشار أمراض اضطرابات الاكل لدى مرضى متلازمة الايض الغذائي يعتبر عالي. اضطراب الاكل القهري كان اكثر شيوعا من النهام العصبي.

Introduction

The world population is accelerating in aging .Age group sixty years and over around the world will increase more than four percent over the next fifteen years, from 12.3% in 2015 to 16.5%in 2030. older persons by 2030 are expected to be 17%in Asia , 20% in Oceania ,Caribbean, Latin America, 6% in Africa and exceed 25% from the population in Europe and in north America [1].

Eating disorders (EDs) consider as heterogeneous groups of complicated psychiatric diseases manifested by unusual eating habits that lead to adverse health effects or may be mortality [2].

Diagnosis throughout adolescents is widely accepted, the most common age onset for eating disorders (EDs) is between sixteen to twenty five years old [3]. In spite of eating disorders (ED) can occurs at any age. It may be occurs as continuation of a lifetime disorder or as late onset disorder[3].The definition of "late onset eating disorder" is uncertain, an onset after forty years old is usually thought-about late onset [4].

Late life eating disorders in people suffering from these disorders reported consider ably less vomiting episodes and less self-harming behaviors and reported history of obesity as past or current condition than peoples with early life EDs [5].

National Eating Disorders Association (NEDA, 2008), reported about nine millions ladies in the United State had EDs [6]. The frequency of late-life EDs ranges from 1.8%-3.8% [7,8]. The commonest EDs among older people are Bulimia Nervosa (BN) and Anorexia Nervosa (AN). The majority (81%) had AN and (10%)had BNas it reported for people over fifty years old and late onset eating disorders were (69%) than early onset [9].

Bulimia Nervosa (BN)manifested by continual attacks of Bing eating subsequent by abnormal behaviors like fasting or dieting, self-induce vomiting, vigorous exercise and more use of laxatives alone or with diuretics, all such behaviors directed to

weight control and continuous concern with weight of the body, shape of body and may be with other psychiatric disorders [10,11].

Binge eating (BE) is associated with eating food in amount larger than any other people eat for the same period of the time and within discrete period of time (two hours) with perceived loss of control of eating in this time . However, in contrast to people with BN, individual with BE were not follow abnormal behaviors related to control of body weight, and it is often times related to overweight and obesity [12].

Anorexia Nervosa (AN) manifested by limited of energy intake from the food that leads to considerably low Body Weight (<85% predicted), undue emphasis on body form, intense concern of body gain [13].

The foremost common disorder across aging id Bing eating disorder (BED) [14].

Population-based studies detected less frequency of Bing eating disorder (0.16% Vs. 1.07%), anorexia nervosa (0.17% Vs. 0.58%) and Bulimia Nervosa (0.21% VS. 0.55%) in women older than 45 years old compared with women younger than this age [15,16].

BN are related to many risk factors like more concentration on weight and shapes, sexual abuse, gastrointestinal problems, negative self- evaluation, and may be with other psychiatric disorders [17].

BN is burdened with a range of complications [gastrointestinal (constipation, diarrhea, gastro-esophageal reflux, Barrett esophagus), cardio-pulmonary (atrial arrhythmias, ventricular arrhythmias), electrolytes disturbances (Metabolic Alkalosis, hypokalemia), musculoskeletal (weakness), gynecological (irregular menstrual cycle) and oral (tooth decay, gingivitis)]. As a result to these complication the management of BN ought to be multidisciplinary [18].

In general eating disorders (EDs) in elderly may be classified into two categories :early-onset EDs (that recurs with aging or be continues from earlier age), late- onset EDs (that occurs for the primary later in life).

The diagnosis of EDs within elderly individual are consistent with the American Psychiatric Association [13].

Eating disorders will manifest equally across the lifetime with spread of various factors to take into consideration in diagnosis and treatment elderly with eating disorders. The frequency estimation of eating disorders in elderly are lacking that result in unclear image of EDs in elderly.

The World Health Organization (WHO) with National Cholesterol Education Program (NCEP) give the most popular definitions to explain Metabolic Syndrome (MS) in elderly. The frequency of MS in elderly range from 11% -43%, Median 21%) consistent with WHO report & according NCEP it was (23%-55%, Median 31%) [19]. Several studies [20-22] reported metabolic syndrome frequency elevated with ageing, the diagnosis of MS is necessary due to about two and half time elevated the risk of cardiovascular diseases (CVD) and fivefold risk for diabetes mellitus (DM) development [23].

The frequency of overweight and obesity has elevated in recent decades for all age groups, concomitantly with population aging. In 2005, IDF sets a new definition criteria for MS with consideration of abdominal obesity by waist circumference (WC) and make it essential for diagnosis of MS. [(Blood pressure $\geq 130/85$ mmHg or Systemic arterial hypertension therapy, Anthropometrics :WC ≥ 94 for male, ≥ 80 for female, Glucose ≥ 100 , triglyceride (TG) ≥ 150 , high density lipoprotein cholesterol (HDL-c): male < 40 and female < 50)]. MS Criterion WC plus 2 components [24].

Research has detected that certain eating behaviors were related to MS are almost like a number of the features characteristic of Bing eating disorder, as an example, eating massive amount of food during short time will related to elevated Fasting glucose level, increase serum lipids, increase insulin secretion in the body, and reduced Glucose tolerance [25], eating quickly related to increase waist to hip ratio, increase serum lipid and with fatty liver among obese persons [26], also, irregular meal patterns

are related to MS within the general population [27].

One of the numerous misconceptions surrounding eating disorders is that they solely occur in young people. Prevalence estimate of eating disorders in aged older sixty years old are often ignored or misdiagnosed in Iraq, leading to an incomplete image of EDs in this age group and tiny is thought regarding the association of eating disorders and characteristic of EDs in MS in this age group, so the objectives of current study were:

- 1.To determine the prevalence of metabolic syndrome (MS) among elderly.
- 2.To explore eating disorders in elderly persons with metabolic syndrome.

Materials and Methods

Study design: a cross-sectional study including (175) participant over 60 years old, from August 2016 to February 2017 convenience sample were included as all participants attending Outpatient Clinic of Geriatrics, Marjan medical city and attended nutrition clinic for themselves or as a relative to other patients in Babylon province, Iraq. The questionnaires simply describe to all elderly persons participate in the current study.

Structured questionnaires were used. The questionnaire was translated into the Arabic language to ensure clarity, standard and uniformity.

Severely ill patients, chronic renal failure, patients with liver failure and persons on corticosteroid treatment, immune-suppressants and cognitive disability were excluded from the study.

Data collection tools: include

A specially designed data sheet was used and the sheet contain:

1-Questionnaires: divided into:

A- socio demographic factors: age, residence, occupation, marital state and educational level.

B- the identification of EDs in older persons according to DSM-5 criteria [13].

2- Blood pressure :blood pressure measured by an automatic sphygmomanometer in the left arm, the participate individual was in sitting position take rest for five minutes and

take two measurements with a difference <4 mmHg between them [28].

3- anthropometric measurements as (height, weight, Body Mass Index (BMI) and Waist circumference (WC)

The measurement of weight (Wt) in kilograms (kg) and height (Ht) in centimeters (cm) by a FILIZOL Amensuration scale.

The Body Mass Index (BMI) was measured by dividing Wt in (Kg) by the square of Ht in meters. The WC was measured with elastic measuring tape at mid- point between the iliac crest& the last rib at the end of exhalation in standing position [29].

4- Biochemical investigations:

Sample of blood were obtained after twelve-hour fasting. fasting serum glucose, HDL cholesterol and TG were measured. MS diagnosis was established with IDF [25].

Ethical considerations

The project was approved by scientific of family and community medicine department and the ethical committee in college of medicine, Babylon university. Verbal consent were obtained from all participants.

Statistical analysis

Data of all elderly participate in current study were analyzed using Statistical Package of Social Science (SPSS) Version 22.

descriptive statistics of the variables were described using frequency distribution and percentage. Mean, standard deviation (SD). difference between two means evaluated by t-test, Chi-squared test and Fisher exact test for measure of the variable studied p-value was set at ≤ 0.05 as cutoff point to be considered as significant differences the results and finding were introduced in tables, figure.

Results

The mean age of the elderly was (67.56 ± 4.987 years old) and body mass index (35.62 ± 5.68) [Table 1]. from a total sample (175), 81 (46%) of the elderly has been diagnosed as metabolic syndrome [Figure 1], with high proportion in women 54 (67%) than men 27 (33%). 28 out of 81 (35%) of subjects with MS had eating disorders. 11 (39%) met criteria of BN and 17 (61%) reported Bing eating, as a current behavior (29%, 73%) for BE and BN respectively and as past behavior (71%, 27%) for BE and BN respectively.

regarding behaviors of BN participant recorded: (self- induce vomiting=0, diet pills=3, laxative=0, diet pills and laxative =1, diuratics =0, fasting =6, exercise =0, fasting and exercise=1).

Table1: Mean metabolic syndrome components

Variable	Mean $\pm$ SD
Age (years)	67.56 ± 4.987
Body mass index (Kg/m ²)	35.62 ± 5.68
Waist circumference (cm)	108.64 ± 18.3
Fasting blood glucose (mg/dL)	127.48 ± 65.95
Triglycerides (mg/dL)	123.259 ± 47.146
HDL-cholesterol (mg/dL)	40.01 ± 8.8
Systolic blood pressure	143.79 ± 16.98
diastolic blood pressure	93.58 ± 9.59

figure 1: distribution of study population according to metabolic and non-metabolic syndrome

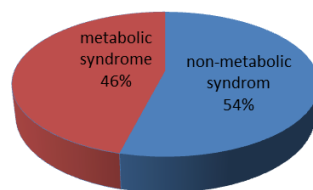


Table 2 shows that the majority (64.3%) of eating disorders participant were at age group 60-69 years old with significant association between two groups with and without eating disorders regarding age, gender, marital state and educational level ($p\text{-value} \leq 0.05$) with significant association of mean (WC, TG and systolic blood pressure) between two comparison groups [Table 3].

Table 2 : Distribution of participants with and without eating disorders according to socio-demographic variables

Variable	Eating disorders (no.=28)(%)	Non-eating disorders (no.=53)(%)	Total (no.=81)(%)	X2	p-value
Age group					
60-69	18(64.3)	35(66)	53(65.4)	15.59a	0.001*
70-80	10(35.7)	18(34)	28(34.6)		
Gender					
Male	4(16.7)	23(40.4)	27(33)	19.9a	0.0001*
Female	20(83.3)	34(59.6)	54(67)		
Residence					
Urban	19(67.8)	31(58.4)	50(61.7)	0.68	0.31
Rural	9(32.2)	22(41.6)	31(38.3)		
Occupation					
Employee	12(42.8)	29(54.7)	41(50.6)	1.03	0.5
Not-employee	16(57.2)	24(45.3)	40(49.4)		
Marital state					
Married	12(42.9)	44(83)	56(69.1)	28.93a	0.0001*
Devoiced/widow/single	16(57.1)	9(17)	25(30.9)		
Educational level					
illiterate/primary/secondary	24(85.7)	31(58.5)	55(68)	21.923a	0.0001*
college/postgraduate	4(14.3)	22(41.5)	26(32)		

*p-value ≤ 0.05 was significant, a=fisher exact test.

Table 3: Mean $\pm$ SD of variables of participants with and without eating disorders

Variables	Eating disorders Mean ($\pm$ SD)	Non-Eating disorders Mean ($\pm$ SD)	t- test p-value	95% confidence interval of difference
age	67.96(5.439)	67.35(4.77)	0.518 0.606	-1.724-2.935
BMI	35.45(6.17)	35.69(5.5)	-0.166 0.896	-3.141-2.664
FBG	148.6(88.7)	118.05(50.79)	1.604 0.1	-8.285-69.378
WC	116.56(23.1985)	105.107(14.536)	2.277 0.029*	1.21-21.68
TG	144.76(58.66)	113.66(37.784)	2.435 0.02*	5.12-57.078
HDL	37.68(8.39)	41.05(8.85)	-1.609 0.112	-7.546-0.798
Systolic blood pressure	149.48(16.711)	141.25(16.63)	2.054 0.04*	0.255-16.204
Diastolic blood pressure	94.4(9.165)	93.21(9.8)	0.511 0.6	-3.42-5.79

BMI=body mass index. FBG=fasting blood glucose. WC=waist circumference. TG=triglyceride HDL=high density lipoprotein. p-value ≤ 0.05 was significant

Discussion

The World Health Organization (WHO) with National Cholesterol Education Program (NCEP) give the most popular definitions to explain Metabolic Syndrome (MS) in elderly. The frequency of MS in elderly range from 11%-43% consistent with WHO report & according NCEP it range from 23%-55% [19].

In a current study from a complete sample (175), 81 (46%) of the elderly has been diagnosed as metabolic syndrome that was approximate the proportion of World Health Organization and NCEP (2009), with female participants have higher prevalence of MS than the men (67% Vs 33%).

As for the MS, its prevalence is increase worldwide, that is perhaps associated with the change in dietary habits, increase in obesity prevalence around the world, sedentary life style and aging [30,31].

This results follow the high mean BMI and mean WC as (35.62 ± 5.68) , (108.64 ± 18.3) respectively and about 35% of MS elderly participant met the criteria of EDs that also associated in increase in BMI.

The frequency of MS in current study is lower than alternative study in Turkey,

Ankara. that reported from sample 164, 61.7% of the elderly diagnosed as metabolic syndrome [32].

In a study among 378 older people older than sixty, the frequency of MS was 56% by the IDF criteria [33].

A study dispensed in Brazil, reported the prevalence of MS was 38.9% used IDF criterion among elderly, with higher prevalence among elderly women [34].

A study in Australia detected the prevalence of metabolic syndrome among seventy years old was in women 46% while in men 36% according to IDF criterion [35].

A study in China, reported the MS frequency was 54% and 35% among elderly women and men respectively, that is reported when used IDF criteria but when applied NCEP-ATPIII criteria to constant population the prevalence decreased to 39% and 18% respectively [36]. There were great differences within the MS prevalence among elderly based on the criteria used for identification and additionally the ethnic and regional characteristic of study population, but in fact, the issue in getting a diagnostic criteria that consider to be sensitive, specific and accurate which are often useful for

assessing general population and overcoming the regional specificities [37]. The majority of EDs among elderly were AN (81%) and BN (10%). With high prevalence of late onset eating disorder (69%) than early onset eating disorders [9].

A study Of 475 Austrian women ages sixty to seventy years old 3.8% met diagnostic criteria of eating disorders, 4.4% supported a persistent one symptom of EDs as vomiting, binge eating, laxative and diuretic use[8].

In current study no cases of AN reported because the objectives of current study was to assess the frequency of eating disorders among MS participants& according to MS diagnostic criteria, AN definition cannot be met [24].

out of 81(35%) of subjects with MS participate in a study had eating disorders , 11(39%) met criteria of BN and 17(61%) reported Binge eating, as a current behavior (29%, 73%) for BE and BN respectively and as past behavior (71%, 27%) for BE and BN respectively. The major eating disorders among aging is Binge eating [14], with a time period prevalence ranging from (1%-3%) [15].

The present study detected 83.3% of elderly with EDs were women compared to 16.7% men [Table 2].

Menopause are more likely for hormonal imbalance and eating disorders as it know that sex hormones play a role in control of eating behaviors. Progesterone and Testosterone increase food ingestion and promoting bulimia and abdominal obesity whereas estrogen reduce it [38].

In addition , the signs of aging as wrinkles, hair loss, emphasis given to appearance, body weight, self- care can be risk factors for body dissatisfaction. The concern of aging were positively associated with eating disorders that majority in women than men [39,40].

Literature information to men that concerning body dissatisfaction are poor. Men are typically less interested in in body appearance and less engaged in any form of eating disorders behaviors [41]. Men in general may face some problems during the life that may facilitate the occurrence of an eating disorders [41], depress patients are

more likely to reported MS and also with eating disorders (EDs) [42].

Eating disorders persons had lower social status, separated or single than with persons with non-eating disorders [43].

The finding of current study that detect EDs more common in urban area than rural area and in non- employment than employment and more in single, widow and divorced and high prevalence of EDs in lower educational level but with no significant association between elderly with EDs and without EDs regarding residence and occupation variables.

More eating disorders in present study was BED (61%) from a sample of twenty eight with EDs. The risk of mortality in persons with EDs is mostly related many complications that occur to obese peoples. Moreover, obese peoples with BED frequently reported impaired in quality of life (QOL) [44]. Furthermore, eating disorders among elderly have consent meaning as an indirect suicide [45].

But, Since all the MS elderly group in current study were assess to had or not had EDs therefore there have been no significant difference regarding the mean age, mean BMI, FBG, HDL and diastolic blood pressure which met with criteria of diagnosis of MS but significant variations between MS with ED and MS without eating disorders in WC with higher mean WC, mean TG and mean systolic blood pressure in EB group.

Obesity and hypertension are basic components of MS. at the same time, MS in an elderly considers as risk factors for cardiovascular morbidity and mortality. All measures to prevent and treat MS would be important for preventing disability and promoting normal aging process [46].

Certain eating behaviors were related to MS like eating massive amount of food during short time will related to elevated Fasting blood glucose level, increase serum lipids, increase insulin secretion in the body, and reduced glucose tolerance [25], eating quickly related to increase waist to hip ratio, increase serum lipid and with fatty liver among obese persons [26], also, irregular meal patterns are related to MS within the general population [27]

From current study, 11 (39%) met criteria of BN and 17 (61%) reported Bing eating, as a current behavior (29%, 73%) for BE and BN respectively and as past behavior (71%, 27%) for BE and BN respectively.

According to the finding of present study shows BE reported earlier than BN. Other study reported late onset EDs were more common (69%) than early onset EDs [9].

In a study reported weight control behaviors, 71.2% of sample involved those trying to lose weight, the weight control behaviors were: diet pills (7.5%), vomiting (1.2%), diuretics (2.5%), laxatives (2.2%) and excessive exercise (6.8%) [47].

In current study the most common weight control behaviors in BN participant were fasting, in Iraqi population fasting especially in elderly is famous behavior it may be range from one to three months, more than any other behaviors that may be difficult due to aging like exercise.

Increase public health awareness towards effective strategies to achieve normal body weight rather than follow in effective and unhealthy behaviors for weight loss that were appears as abnormal weight control behaviors which create additional medical problems than they solve especially in elderly individuals.

Many limitation in the interpreting the results of current study include the sample size since all participant ought to had all investigation to meet the criteria of MS that were not always easily. use of a non-probability sampling technique made the sample selected not representative of all populations in Babylon province and as a consequence for all Iraqi population. In addition some data are based on self-reports of the patients, possibly leading to under or over reporting therefore reporting bias cannot be excluded.

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