Depression and Obesity/Overweight Association in Elderly Women: a Community-Based Case-Control Study

Seyed Mehdi Ahmadi[1], Sareh Keshavarzi[2], Seyed-Ali Mostafavi[3], and Kamran Bagheri Lankarani[1]

[1] Health Policy Research Center, Shiraz University of Medical Sciences, Fars, Iran

[2]Department of Epidemiology, School of Health and Nutrition, Shiraz University of Medical Sciences, Fars, Iran

[3]Psychiatry Research Center, Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, Iran

Received: 02 Jun. 2014; Accepted: 24 Dec. 2014

Abstract- Overweight/obesity and depression are common among women especially in the elderly and can lead to unfavorable outcomes. We aimed to determine the association of overweight with depression and also to find any correlation of depression with some anthropometric indices in old women. A total of 94 depressed elderly women were compared with 99 non-depressed controls. The structured diagnostic interview based on DSM-IV were performed to diagnose depression, and Geriatric Depression Scale (GDS) was completed to rate it. Anthropometric indices were measured and compared between groups. Pearson correlation coefficients were determined for linear relations between variables. Odds Ratio of obesity and overweight in depressed subjects comparing with normal participants was 1.45 (95%CI=0.63-3.32). A significant correlation was observed between BMI and GDS score (r=0.231, *P*-value=0.001). Total body fat (*P*-value=0.001) and BMI (*P*-value=0.016) were significantly higher in depressed women than non-depressed women. Despite the significantly higher total body fat and BMI among old women with depression, only a weak correlation was seen between BMI and GDS score.

Acta Med Iran 2015;53(11):686-689.

Keywords: Anthropometry; Body Mass Index; Depressive Disorders; Obesity; Women

Introduction

Depression and obesity or overweight are common disorders which separately have been studied by many investigators, but still little is known about their co-morbidity. The way these two disorders had been distributed in society and the time-trends are similar to each other. Both are prevalent and have the same increasing trends. Women are more depressed and obese than men (1), and the trends of both depression and obesity are related to age (1-3). Overall, it comes to the mind that these two disorders might have some overlap with each other. On the other hand obesity and depression, both have serious health and community consequences (3-5). Therefore, it needs more studies to reveal the aspects of their co-morbidity.

Furthermore, the association of depression with anthropometric indices is indistinct and linking depression with overweight and obesity status is still controversial. Some literature has shown that geriatric depression depends on nutritional status and anthropometric indices in the elderly population (6). Some studies have reported weight gain and visceral fat accumulation in depressed women subjects; while others report depression as a contributing factor to weight loss (7,8). Furthermore, previous studies have revealed the association of nutritional status and micronutrients with depression (6,9,10). But, still little is known about the aspects of association of depression with obesity.

The aims of the current study were to determine the association of overweight with depression and also to find any correlation of depression with some anthropometric indices in women.

Materials and Methods

Subjects and measurements

This study was a community-based case-control design. Cluster sampling, by a population-based data set, (based on municipality residential area– Shiraz, Iran;

Corresponding Author: S.A. Mostafavi
Psychiatry Research Center, Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, Iran
Tel: + 98 917 7921205, Fax: + 98 21 55421959, E-mail address: mostafavi.n80@hotmail.com

2013) was used and then simple random sampling was conducted within each cluster. A team composed of a qualified dietitian and trained and experienced physician in screening depression was sent to the field. The interviewers tried to perform psychiatric interviews and take anthropometric assessments in a calm environment. Furthermore, a demographic/socio-economic questionnaire was completed for each person.

A total of 125 over 50-years-old-women fulfilling the criteria for depression based on DSM-IV were entered into the case group, 94 women acceded and completed the study (response rate: 75.2%). Of the same sampling frame, 125 over 50-years-old non-depressed women were selected to be used as the control group 99 women acceded and completed the study (response rate: 79.2%). Each subject signed the informed written consent form to take part in the study, which was approved by the ethical committee of Shiraz University of Medical Sciences, Iran.

To screen the women with depression, the structured diagnostic interview was performed by a trained physician in a calm environment. Furthermore, Geriatric Depression Scale-15 (GDS) questionnaire Farsi version was used for rating the scores for depression. This tool has been validated in a society where used (11). In the GDS, according to screening part, if the score of the patient is 8 points or less, the patient is not at risk (11).

Weight, height, waist circumference, hip circumference and total body fat were measured all in standard situations by the dietitian and then waist to hip ratio (WHR) and body mass index (BMI) were calculated. BMI was categorized as normal weight (<24.9 kg/m2), overweight (25.0 to 29.9 kg/m2), or obese (≥30.0 kg/m2).

Statistical analysis

Means of quantitative variables including body mass index, waist, WHR, and total body fat were compared between cases and controls by means of independent sample t-test. Pearson correlation coefficient was calculated for a linear relation between total GDS scores and continuous variable of BMI.

Significance was evaluated at $P \leq 0.05$ level. Data were analyzed by using the SPSS-17 software.

Results

Total of 193 women completed the study. The means ± SD age of cases and controls were 61.3±7.9 and 62.1 ± 8.1 respectively. The socio-economic and educational levels were distributed equally between cases and controls groups. In a depressed group, 83 women were obese or overweight, and 11 women were normal weight while in the control group 83 women were obese or overweight and 16 were normal weight. Using chi-square test, Odds Ratio of obesity and overweight in depressed participants comparing with normal participants was 1.45 (95% CI=0.63 to 3.32). A significant correlation was seen between BMI and GDS score (r=0.231, *P*-value=0.001).

Total body fat and BMI were significantly higher in depressed comparing with non-depressed women. Anthropometric variables in elderly women with depressive symptoms comparing with elderly women with no depressive symptoms are listed in Table 1. When categorizing the age covariate into three groups (50-59.9, 60-69.9 and ≥70 years old), mean BMI was still higher in women with depression comparing to non-depressed women in all three subgroups (Figure 1).

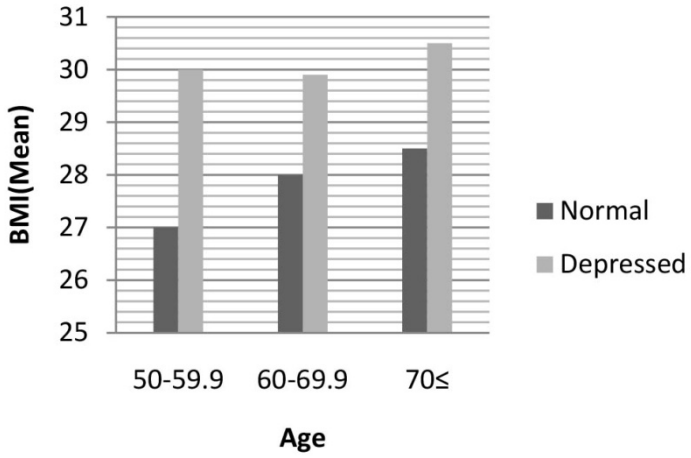

Figure 1. Mean BMI is greater in women with depression in all three age subgroups

Table 1. Anthropometric characteristics in elderly women with depressive symptoms comparing with elderly women with no depressive symptoms

Variables	Normal (n=99) Mean(SD)	Depressed (n=94) Mean(SD)	*P*-value
Waist	91.31(10.48)	92.53(15.88)	0.527
Waist to Hip ratio	0.88(0.06)	0.88(0.12)	0.323
BMI	27.73(4.03)	29.31(4.8)	0.016†
Total body fat	37.73(10.5)	42.37(7.8)	0.001†

†: Significance at the *P* value≤0.05 level using independent sample t-test

Discussion

In contrast with a similar work on patients with metabolic syndrome Erika *P* Guedes and colleagues found no association between BMI and depression (using Hospital Anxiety and Depression Scale (HADS)) (r=0.01; p=0.94 and r=−0.12) (12). It might have occurred due to a smaller sample size of their study, the different and broad range of participant's age and involving men in their study (Fifty patients-40 women, 18–50 years old). Guedes et al found no association between Beck Depression Inventory (BDI) scale and WC and WHR (12). They found a significant correlation between total body fat percentage and depression. These results were similar to ours. Laborde JE and Sáez-Santiago E in Puerto Rico also found similar results (13). The correlation between depression and weight was found in women with BMI greater than 35 not in men.

Obesity and depression association is very complicated. To discuss this association, paying attention to the genetic roots of obesity and depression may be helpful. Comings *et al.,* identified the gene ObD7s near the OB gene on chromosome 7 as a responsible gene for both depression and obesity (14). The association of both depression and obesity with syndrome X and proximity of the corresponding genes are worthy of further investigations.

We were aware of gender role as the main moderator for obesity and depression association. In contrast to men, Faith found a positive association between obesity and depression in women (15). So in the design we confined current study to women population.

Low physical activity is another factor which may mediate the association between obesity and depression. Depression may lead to low physical activity and the later is one of the main causes of obesity (16). The significantly higher BMI and total body fat levels in this study may have been mediated by lower level of physical activity in depressed women.

On the other hand, atypical depression is associated with overeating and carbohydrate craving due to chronic stress especially in women (17). So overeating may be another contributing factor which may lead to higher BMI and total body fat in women with depression in the current study.

The association between obesity and depression is so strong that Ronald Rosmond in his paper has mentioned the obesity and depression as different names and expressions of the same disease process (18).

A longitudinal cohort study of non-obese young participants with depression is strongly needed to determine the causal pathway of this association. Furthermore, additional clinical trials are needed to focus on solving this co-morbidity.

Despite the significantly higher total body fat and BMI among old women with depression, only a weak correlation was seen between BMI and GDS score.

The current study was not able to detect the causal relationship between depression and obesity in old women. Hence, longitudinal cohorts and trial studies are needed on this field to reveal the causal associations.

This work was supported financially by health policy research center; Shiraz, Iran. Authors declare no commercial conflict of interest related to this work.

Acknowledgement

We are thankful of the health policy research center; Shiraz, Iran for their financial support.

References

1. Kessler RC. Epidemiology of women and depression. J Affect Disord 2003;74(1):5-13.
2. Burt VK, Stein K. Epidemiology of depression throughout the female life cycle. J Clin Psychiatry. 2002;63(Suppl 7):9-15.
3. Wyatt SB, Winters KP, Dubbert PM. Overweight and obesity: prevalence, consequences, and causes of a

growing public health problem. Am J Med Sci 2006;331(4):166-74.
4. Luppino FS, de Wit LM, Bouvy PF, et al. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. Arch Gen Psychiatry 2010;67(3):220-9.
5. Franko DL, Striegel-Moore RH, Bean J, et al. Psychosocial and health consequences of adolescent depression in Black and White young adult women. Health Psychol 2005;24(6):586-93.
6. Ahmadi SM, Mohammadi MR, Mostafavi SA, et al. Dependence of the geriatric depression on nutritional status and anthropometric indices in elderly population. Iran J Psychiatry 2013;8(2):92-6.
7. Huffman GB. Evaluating and treating unintentional weight loss in the elderly. Am Fam Physician 2002;65(4):640-50.
8. Alibhai SM, Greenwood C, Payette H. An approach to the management of unintentional weight loss in elderly people. CMAJ 2005;172(6):773-80.
9. Ranjbar E, Kasaei MS, Mohammad-Shirazi M, et al. Effects of zinc supplementation in patients with major depression: a randomized clinical trial. Iran J Psychiatry 2013;8(2):73-9.
10. Ranjbar E, Shams J, Sabetkasaei M, et al. Effects of zinc supplementation on efficacy of antidepressant therapy, inflammatory cytokines, and brain-derived neurotrophic factor in patients with major depression. Nutr Neurosci 2014;17(2):65-71.
11. Malakouti SK, Fatollahi P, Mirabzadeh A, et al. Reliability, validity and factor structure of the GDS-15 in Iranian elderly. Int J Geriatr Psychiatry 2006;21(6):588-93.
12. Guedes EP, Madeira E, Mafort TT, et al. Body composition and depressive/anxiety symptoms in overweight and obese individuals with metabolic syndrome. Diabetol Metab Syndr 2013;5(1):82.
13. Laborde JE, Saez-Santiago E. Association between obesity and symptoms of depression of adults in Puerto Rico. P R Health Sci J 2013;32(3):132-7.
14. Comings DE, Gade R, MacMurray JP, et al. Genetic variants of the human obesity (OB) gene: association with body mass index in young women, psychiatric symptoms, and interaction with the dopamine D2 receptor (DRD2) gene. Mol Psychiatry 1996;1(4):325-35.
15. Faith MS, Flint J, Fairburn CG, et al. Gender differences in the relationship between personality dimensions and relative body weight. Obes Res 2001;9(10):647-50.
16. Weyerer S. Physical inactivity and depression in the community. Evidence from the Upper Bavarian Field Study. Int J Sports Med 1992;13(6):492-6.
17. Docherty JP, Sack DA, Roffman M, et al. A double-blind, placebo-controlled, exploratory trial of chromium picolinate in atypical depression: effect on carbohydrate craving. J Psychiatr Pract 2005;11(5):302-14.
18. Rosmond R. Obesity and depression: same disease, different names? Med Hypotheses 2004;62(6):976-9.