

Observational Study

Relation of binge eating disorder with impulsiveness in obese individuals

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Abstract**AIM**

To investigate the levels of impulsiveness, and the relationship between the binge eating disorder (BED) and the levels of impulsiveness in obese individuals.

METHODS

Two hundred and forty-one obese patients who were included in the study and candidate for bariatric surgery (weight loss surgery) were clinically interviewed to identify the BED group, and patients were divided into two groups: Those with BED and those without BED. The comorbidity rate of groups was determined by using structured clinical interview for DSM-IV (SCID- I). A sociodemographic data form including the story of previous psychiatric treatment, structured clinical interview for DSM-IV (SCID- I), Beck Anxiety Inventory, Beck Depression Inventory (BDI) and Barratt Impulsiveness Scale-11 were applied to both of the groups.

RESULTS

In regard to 241 obese individuals included in the study, total score and score of attention subscale for BED (+) group were significantly high ($P < 0.05$). In addition, suicide attempt, story of psychiatric consultation, and score for BDI were again significantly high in the BED (+) group ($P < 0.05$).

CONCLUSION

In assessment of obese individuals, assessment of associated psychopathology such as impulsive characteristics and suicide attempt in addition to disrupted eating behaviors will allow to have a more extensive view.

Key words: Binge eating; Obesity; Impulsiveness

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Core tip: Impulsiveness is a multidimensional personality trait that leads to uncontrolled and excessive intake of food, thus contributing to development and maintenance of obesity. Obese patients who were included in the study and candidate for weight loss surgery were clinically interviewed to identify the binge eating disorder (BED) group and patients were divided into two groups: Those with BED and those without BED. Impulsivity, suicide attempt, story of psychiatric consultation, and score for depression were significantly high in the BED (+) group. Impulsive characteristics and suicide attempt in addition to disrupted eating behaviors will allow to have a more extensive view.

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INTRODUCTION

Over the past 30 years, the prevalence of obesity has been gradually increased worldwide and the obesity is regarded as one of the major problems for community health^[1,2]. Furthermore, obesity is a condition associated with reduced life expectancy^[3]. Impulsiveness is a multi-dimensional personality trait that leads to uncontrolled and excessive intake of food, thus contributing to development and maintenance of obesity^[4,5].

After defined by Albert Stunkard for the first time^[6], research on binge eating disorder (BED) has been increasingly growing in time. While BED is included in the eating disorder not otherwise specified in the DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders 4th revised edition), it is reclassified alone^[7] under a separate title for diagnosis in the DSM-5^[8] published in May 2013. So, the BED is classified as a standard eating disorder as Anorexia Nervosa and Bulimia Nervosa^[9]. Redefining BED has not changed the diagnostic criteria, but time criteria for incidence of BED attacks is reduced in order to facilitate diagnosis of BED. Such changes may be seen as increased importance of BED diagnosis category.

The binge eating behavior is largely associated with obesity and defines a subgroup of individuals with excessive eating that shows significant differences^[10]. The

BED may be seen in general society, but is mostly seen in obese individuals and in groups seeking a therapy for obesity^[11]. The BED is characterized by compulsively eating a large amount of food without balancing behavior and it is the most common eating disorder in the obese patients^[7]. Although the prevalence of BED varies in a wide range in the obese population, it may be as high as 30%-57% in obese individuals seeking for a therapy and morbidly obese individuals who are candidate for bariatric surgery^[11-14]. In a multi-center fieldwork including 1984 cases, the prevalence of BED was 2% in the general population and 30.1% in the population participating in hospital-supported weight control programs^[15]. The rate for BED was 23.1% in a study including 281 non-obese university students in our country^[16]. In other studies performed on obese patients in our country again, the rates for BED were 22.4% and 23%, respectively^[17,18].

Failures in the bariatric surgery are attributed to psychological factors and/or eating disorders rather than technical causes^[19]. Impulsiveness may be a predictor for poor prognosis and negative outcomes in eating disorders^[20,21]. The presence of BED may cause to regain the weight that has been lost after bariatric surgery^[22-24]. However in our study, there was no significant differences between the mean body mass index (BMI) of BED (+) and BED (-) groups. The reason for this result can be related with that BED might be affecting the recovery of the lost body weight, not the initial weight loss.

Increasing number of literatures suggest that eating disorders are associated with impulsiveness especially when binge eating is prominent^[25,26]. The literature has studies indicating that those with BED have higher impulsive characteristics^[27-31]. There is a study performed in our country that found that impulsiveness was higher in the obese individuals than that of normal control group and overweight^[32]. Another Turkish study showed that morbidly obese patients had higher impulsiveness than healthy control^[33].

The obesity is an area where increasingly more studies are performed about the relationship between BED and impulsiveness. Our study has relatively higher number of patients, including morbidly obese and super morbidly obese patients who were candidate for bariatric surgery. The objective of this study was to investigate the relation of BED with impulsiveness in obese patients and to provide a more extensive view on assessment of disrupted eating behavior based on the obtained results.

MATERIALS AND METHODS

Methods

Two hundred and forty-one obese patients were successively included in the study, who admitted to Bagcilar Training and Research Hospital for bariatric surgery between July 2012 and October 2013 and transferred to psychiatry service for consultation. Thirty-four (14.1%) of 241 morbidly obese patients were obese, 150 (62.2%) were morbidly obese, and 57 (23.7%) were super-

morbidly obese. These individuals were included in this study performed as part of a comprehensive review on disorders associated with obesity. Among the individuals included in the study, 60 (24.9%) were males and 181 (75.1%) were females. A clinical interview was performed with obese patients to identify the BED group. The patients were divided into two groups according to administrated structured clinical interview for DSM-IV (SCID-I) BED comorbidity rate. The age range for patients was between 16 and 61 years. The individuals who were illiterate, who stated that they were unable to complete the scales, and who voluntarily wished to discontinue during the study were excluded from the study. The exclusion criterias were: Having a psychological disease affecting reasoning, substance use, pregnancy, and any disease restricting ability to move.

The participants were administrated a sociodemographic assessment form including eating habits and diet characteristics, Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and Barratt Impulsiveness Scale-11 (BIS-11).

The volunteers participated in the study were asked to sign an informed consent form. It was clearly explained in detail that responses to scales provided by participants would not affect the surgical process. Approval of ethics committee of Bagcilar Training and Research Hospital was obtained for the study.

Materials

The sociodemographic data form: Developed by the researchers to collect research data, this form included sociodemographic characteristics of volunteers (age, gender, education and marital status) and questions about disease-related characteristics.

The structured clinical interview for DSM-IV Axis I disorders: A diagnostic scale developed by First *et al*^[34] (1997). SCID-I has been translated into Turkish and validity and safety studies have been performed^[35].

The BDI: One of the most frequently used scales for mental health screening or research on depression. It was developed by Beck in 1961. It is a self-report measure and has 21 items with 15 including psychological symptoms and 21 including somatic symptoms. The highest score to get is 63. A higher score indicates increase in complaints for depression. The cutoff score was 17 in the study performed by Hisli for validity and safety, and the author reported that scores equal to or higher than 17 were able to differentiate a depression requiring therapy with 90% of accuracy^[36,37].

The BAI: This inventory comprises of 21 questions. It is a self-report measure. Each question is assessed between 0 and 3 scores and the high scores indicate the severity of anxiety experienced by individual. So, total score to get from this inventory ranges from 0 to 63. This inventory was developed by Beck (1988) and standardized for Turkish version by Ulusoy^[38] (1993).

The BIS-11: Developed by Patton *et al*^[39] in 1995. It is completed by patients to assess impulsiveness. Four different sub-scores are obtained from BIS-11; total score includes non-planning, attention and motor impulsivity. The higher total score from BIS-11 indicates the higher level of impulsiveness of the patient. The validation and safety study for Turkish version of BIS-11 was performed by Güleç *et al*^[40].

Statistical analysis

The data were entered into the computer using SPSS 15.0 (Statistical Package for Social Science). The data were assessed by parametric and non-parametric statistical analyses based on the distribution of data. For quantitative evaluation, Mann-Whitney *U* or Student-*t* test was used for pairwise comparison. Kruskal-Wallis test was used for triple comparisons. χ^2 test was performed for qualitative evaluation. $P < 0.05$ was considered significant.

RESULTS

After psychiatric interviews conducted, 75 (31.1%) of 241 obese patients were diagnosed with BED. The BED (+) group was composed of 62 (82.7%) female and 13 (17.3%) male patients. The mean of BMI of BED (+) and BED (-) groups was compared and there were no significant differences between values which were 46.6 and 45.5 respectively. In comparison of sociodemographic data, no statistically significant differences were found between groups (Table 1). Ceasing smoking cigarette in the last six months was assessed for groups in order to exclude the influence of ceasing smoking on the weight, and no statistically significant differences were found.

The comparison of rates for previous psychiatric admittance of BED (+) and BED (-) groups of obese individuals were 49.3% and 30.1% respectively. The differences were statistically significant ($P < 0.05$). However, no statistically significant differences were found in comparison of BED (+) and BED (-) groups 8.0% and 3.0% respectively, for psychiatric comorbidity at the time of study ($P > 0.05$) (Table 2).

The difference was statistically significant in comparison of thinking of suicide in any phases of life of BED (+) and BED (-) groups of obese individuals 34.7% and 15.7% respectively and previous attempts to suicide 21.3% and 8.4% respectively ($P < 0.05$) (Table 2).

The scores of BED (+) and BED (-) groups were 20.04 ± 11.08 and 14.77 ± 8.40 , respectively, in comparison of scores from BDI of two groups. The difference was statistically significant ($P < 0.05$) (Table 3).

The groups were compared for scores from BAI and the scores of BED (+) and BED (-) groups were 16.72 ± 11.76 and 13.70 ± 9.78 , respectively. The difference was not statistically significant ($P > 0.05$) (Table 3).

While no significant differences were found between BED (+) and BED (-) groups in non-planning 26.59 ± 5.32 and 25.82 ± 4.34 respectively and motor sub-scales

Table 1 Comparison of the sociodemographic and clinical characteristics of the binge eating disorder (+) and binge eating disorder (-) group

		Overall		BED (+) group		BED (-) group		P
Age		36.49 ± 10.14		35.05 ± 9.61		37.13 ± 10.33		0.141
Sex	Females	181	75.1%	62	82.7%	119	71.7%	0.068
	Males	60	24.9%	13	17.3%	47	28.3%	
Marital status	Married	154	63.9%	48	64.0%	106	63.9%	0.983
	Single	87	36.1%	27	36.0%	60	36.1%	
Education level	Primary	81	33.6%	28	37.3%	53	31.9%	0.62
	Middle	107	44.4%	30	40.0%	77	46.4%	
	High	53	22.0%	17	22.7%	36	21.7%	
Physically active	Yes	179	74.3%	55	73.3%	124	74.7%	0.874
	No	62	25.7%	20	26.7%	42	25.3%	
Weight (kg)		124.82 ± 18.23		124.37 ± 17.57		125.03 ± 18.57		0.796
BMI		45.89 ± 6.08		46.69 ± 6.69		45.53 ± 5.76		0.195
Cigaret (yr)		6.23 ± 8.35		5.45 ± 7.56		6.58 ± 8.68		0.331
Quit smoking in the last six months		31 (12.9%)		6 (8%)		25 (15.1%)		0.130

BED (+): Group with binge eating disorder; BED (-): Group without binge eating disorder; BMI: Body mass index.

Table 2 Comparison of the psychiatric and suicidal features of the binge eating disorder (+) and binge eating disorder (-) group

		Overall		BED (+) group		BED (-) group		P
Previous psychiatric admittance	Yes	87	36.1%	37	49.3%	50	30.1%	0.004
	No	154	63.9%	38	50.7%	116	69.9%	
Psychiatric comorbidity	Yes	11	4.6%	6	8.0%	5	3.0%	0.086
	No	230	95.4%	69	92.0%	161	97.0%	
Thinking of suicide	Yes	52	21.6%	26	34.7%	26	15.7%	0.001
	No	189	78.4%	49	65.3%	140	84.3%	
Previous attempts to suicide	Yes	30	12.4%	16	21.3%	14	8.4%	0.005
	No	211	87.6%	59	78.7%	152	91.6%	

BED (+): Group with binge eating disorder; BED (-): Group without binge eating disorder.

21.36 ± 4.86 and 20.21 ± 3.79 respectively of BIS-11, total score 64.84 ± 9.75 and attention sub-scale 17.03 ± 3.24 were statistically significantly higher in the BED (+) group ($P < 0.05$) (Table 4).

DISCUSSION

In our study, general psychopathologic and impulsive characteristics were evaluated and examined based on the BED in obese patients (including 34 obese, 150 morbidly obese and 57 super-morbidly obese patients).

The previous psychiatric admittance of BED (+) group was higher. The relevant literature has similar results^[11]. In addition, the BED (+) group has statistically significantly higher depressive symptoms in our study. This is again in agreement with previous studies^[14,41-44]. The depression itself may contribute to persistence of symptoms of eating disorder^[45]. Furthermore, depressive symptoms may predispose individuals to develop binge eating behavior^[11]. However, there were no significant differences between the current rates for psychiatric comorbidity diagnosis in groups during the performance of study. This result, which is not consistent with the literature, was attributed to the fact that study sample included individuals who felt healthy enough to attempt seeking for treatment of obesity.

In the present study, the rate for attempting suicide, defined as an impulsive behavior, was statistically significantly higher in the BED (+) group. There are data that the rate for attempting suicide is high in eating disorders where obesity and binge eating are prominent^[46-48]. In addition, a Turkish study reported that self-destructive behavior was significantly high in the group of eating disorders^[49].

The relation of eating disorders with impulsiveness is complex. Impulsiveness may be characteristic only for a specific subgroup of eating disorders^[26] or may manifest after eating disorder occurs^[50]. Nonetheless, there is only little information about the influence of impulsiveness on the eating habits of obese individuals and individuals with BED^[51]. In the present study, BIS-11 total score and score from attention sub-scale were statistically significantly higher in the BED (+) group. Inattention or cognitive impulsiveness assesses making quick decisions without thinking attentively on the matter or cognitive instability^[39]. Obese individuals have an inhibition problem against stimulus in the form of food and problem with focusing attention, and such cognitive deficits are much severer in obese individuals with BED^[52]. Among eating disorders, the BED may be seen as a different impulse control disorder^[49]. Moreover, those with BED (+) may form a subgroup that has specific impulsive

Table 3 Comparison of the Beck Depression Inventory and Beck Anxiety Inventory between binge eating disorder (+) and binge eating disorder (-) group

	Overall	BED (+) group	BED (-) group	P
Beck depression inventory	16.41 ± 9.61	20.04 ± 11.08	14.77 ± 8.40	0.000
Beck anxiety inventory	14.64 ± 10.50	16.72 ± 11.76	13.70 ± 9.78	0.064

BED (+): Group with binge eating disorder; BED (-): Group without binge eating disorder.

Table 4 Comparison of the Barratt Impulsiveness Scale-11 between binge eating disorder (+) and binge eating disorder (-) group

	Overall	BED (+) group	BED (-) group	P
BIS-11 total	62.84 ± 8.83	64.84 ± 9.75	61.93 ± 8.25	0.018
BIS-11 attention	16.22 ± 3.28	17.03 ± 3.24	15.85 ± 3.25	0.010
BIS-11 motor	20.57 ± 4.18	21.36 ± 4.86	20.21 ± 3.79	0.072
BIS-11 non-planning	26.06 ± 4.67	26.59 ± 5.32	25.82 ± 4.34	0.275

BED (+): Group with binge eating disorder; BED (-): Group without binge eating disorder; BIS-11: Barratt Impulsiveness Scale-11.

characteristics across all obese patients^[53]. In addition, there are studies establishing that individuals who have both obesity and BED more commonly have comorbid mental disorders associated with impulsiveness such as drug dependency and attention deficit/hyperactivity disorder, and many behavioral patterns^[54-56].

In studies performed on eating disorders, motor impulsivity^[57,58] and inattention^[59] were higher in the groups with prominent binge eating. In addition, many research showed increased score for impulsiveness in individuals with BED and obesity^[10,31,60,61]. In a study performed by Nasser *et al.*^[51] using BIS-11, individuals with BED had higher motor impulsivity and criteria for BED were positively correlated with scores from BIS-11. Furthermore, the same study identified a relationship between the variables of motor impulsivity and mood, and suggested that this relationship might be associated with possible serotonin transmission disorder in the BED^[51].

Two characteristic features of BED are associated with impulsiveness, which are inability to stop eating, sense of lost control, and eating in a certain time unit in which most people would simply eat more than they could eat. Especially, impulsive characteristics were found to be high in those with BED^[62]. In addition, higher rates for suicide attempt, an impulsive behavior, in the BED (+) group suggest that it might be associated with higher impulsiveness in this group. Although the BED (+) group had higher scores for depression and history of psychiatric admittance than those of other group, there were no significant differences between the rates for current psychiatric comorbidity at the time of study. In assessment of data obtained from this study, it will be reasonable to place an emphasis on impulsiveness.

For clinical efficiency, it would be useful that professionals working on eating disorders and obesity include the presence and quantity of underlying impulsive characteristics in addition to disrupted eating behavior in the assessment process. In current research on the obesity,

approach to preservation of weight lost after bariatric treatment rather than losing weight is included in the research phases that become prominent. Among many important causes, inclusion of impulsive personality traits in the assessment process may increase the success rate in the field.

Limitations of our study include absence of a control group and use of a self-report scale rather than more objective methods to assess impulsiveness of participants. It would be useful that results obtained from this study should cover a larger group of cases, not only hospital samples seeking for treatment, and that this study should be repeated with more objective diagnostic instruments that are able to measure impulsiveness in the behavioral dimensions.

COMMENTS

Background

Over the past 30 years, the prevalence of obesity has been gradually increased worldwide and the obesity is regarded as one of the major problems for community health. Furthermore, obesity is a condition associated with reduced life expectancy. Impulsiveness is a multidimensional personality trait that leads to uncontrolled and excessive intake of food, thus contributing to development and maintenance of obesity. The objective of this study was to investigate the levels of impulsiveness, and the relationship between the binge eating disorder (BED) and the levels of impulsiveness in obese individuals.

Research frontiers

In assessment of obese individuals, assessment of associated psychopathology such as impulsive characteristics and suicide attempt in addition to disrupted eating behaviors will allow to have a more extensive view.

Innovations and breakthroughs

The previous psychiatric admittance of BED (+) group was higher. The relevant literature has similar results. In addition, the BED (+) group has statistically significantly higher depressive symptoms in our study. This is again in agreement with previous studies. The depression itself may contribute to persistence of symptoms of eating disorder. Furthermore, depressive symptoms may predispose individuals to develop binge eating behavior. There are data that the rate for attempting suicide is high in eating disorders where obesity and binge eating are prominent. In addition, a Turkish study reported that self-destructive behavior was

significantly high in the group of eating disorders.

Applications

For clinical efficiency, it would be useful that professionals working on eating disorders and obesity include the presence and quantity of underlying impulsive characteristics in addition to disrupted eating behavior in the assessment process.

Terminology

Bariatric surgery; weight loss surgery, binge eating disorder; is characterized by compulsively eating a large amount of food without balancing behavior and it is the most common eating disorder in the obese patients.

Peer-review

The manuscript is interesting, well written and provides important insights for understanding the characteristics of the impulsiveness that leads to uncontrolled and excessive intake of food.

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