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Obesity and life events: the hypothesis of psychological phenotypes

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Abstract

Psychological studies on obesity have focused on finding common characteristics in the population of people with obesity, such as personality traits. In contrast, in the field of medicine, individual differences are shown, for example in terms of metabolic phenotypes.

This article proposes a clinical and theoretical observation about the role of life events in the development of obesity. Patients affected by obesity actually report differentiated life and weight control histories. The proposal is to distinguish these types of patients into two psychological phenotypes at the initial assessment, because surgical and post-surgical outcomes may differ. While from a mental health point of view, identifying these elements may be an indicator to direct the patient to an appropriate and targeted psychological treatments.

Keywords: Obesity, Life events, Trauma, Phenotypes, Psychotherapy.

1. Introduction

The World Health Organization (WHO) defines "obesity" as a condition characterized by an excessive presence of adipose tissue in the human body, which induces a significant risk increase for the health state. The simple definition of obesity as an imbalance between the energy introduced into the body and the energy expended tends to ignore the complexity of the pathology. Different factors interacting with each other are responsible for weight gain, therefore the etiology of obesity must be sought individually on the basis of complex genetic, environmental and psychological factors interactions.

Obesity is widely recognized as a risk factor for multiple diseases, such as hypertension, dyslipidemia, cardiovascular disease, type 2 diabetes, arthritis, some cancers and depression, and is associated with reduced life expectancy and quality of life, as well as with lower general mental health. However, the underlying causes of obesity are poorly understood, even among health professionals. Two surveys found that a significant number of primary care professionals believed that the three most important causes of obesity were physical inactivity, overeating, and high-fat dieting (Farooqi

& O'rahilly, 2007; Hill, Williams & Fruhbeck, 2009; Smith & Smith, 2016).

However, the 2007 Foresight report highlighted over 100 different biological, psychological, environmental and social factors that potentially contribute to obesity. These factors range from genetic predisposition or neurochemical imbalances to emotional aspects, such as boredom or comfort eating, and complex social pressures that can begin in childhood with the need to finish a plate of food, and continue throughout life and can make healthy choices difficult (McPherson, Marsh & Brown, 2007).

Regardless of the underlying cause, once weight gain occurs, the body resists any attempts at weight loss. A normal physiological response to weight gain would be a lowering of the metabolic rate and an increase in hunger, to maintain the new status quo. Therefore, even when an individual is successful in losing weight, weight gain will occur in most people and lifelong treatment is required to maintain the new normal weight. For this reason, obesity requires ongoing management similar to other long-term chronic conditions but is accompanied by an unprecedented degree of stigmatization (Puhl & Heuer, 2010).

In our view, the first step in combating this stigma is to speak correctly, both among healthcare professionals, when confronting the general public, and in clinical encounters between a healthcare professional and a person with obesity, putting in light of the possible psychological factors involved (Di Pauli, 2016).

2. The myth of obesity psychological patterns

The first formal attempts to establish a relationship between obesity and psychological aspects date back to the original psychoanalytic conceptualizations of Hilde Bruch (1948), up to the more recent relational-systemic and cognitive-behavioral perspectives. The aim of the Authors was to formulate psychogenetic hypotheses of obesity, theoretical models that could explain and predict the onset of obesity starting from previous psychological, psychosocial and dysfunctional family conditions (Slochower, 1987).

However, scientific reflection on the links between obesity and psychological factors has evolved considerably over the years, especially from an empirical and methodological point of view. The empirical studies of the first generation, in the wake of the psychogenetic considerations of obesity, tried to find similarities in the psychological, psychosocial and psychopathological profiles of people affected by obesity, comparing them with normal weight individuals. The main objective of these researches was precisely to explain the etiology of obesity by analysing the causal contribution of psychological factors. However, these early empirical studies failed to demonstrate psychological homogeneity among obese people (see “The psychogenic theory of obesity” Burchinal and Eppright, 1959). The authors concluded that there is no personality, psychopathology or psychological profile that could explain the development of obesity (Friedman and Brownell, 1995).

To date, despite the fact that research has grown and hundreds of studies have been carried out, there is no sufficiently valid and reliable empirical evidence that clearly demonstrates the existence of a specific psychological and

psychopathological configuration among people with obesity (Vaidya, 2006).

In parallel, and subsequently to the etiological studies, some researchers changed their perspective and began to consider the psychological and psychopathological consequences of obesity rather than the causes. The idea spread that personality disorders or psychopathological disorders were more likely the results of being affected by obesity than the causes (Bocchieri *et al*., 2002). However, the cross-sectional comparisons that were performed between groups of individuals with obesity and groups of individuals of normal weight produced inconsistent. In fact, some studies showed that people with obesity suffered more than people of normal weight, while others found that obesity had an apparent protective effect against psychological distress. The extreme diversity of the results was largely due to the differences that existed between the samples of individuals recruited and also the weak methodological approaches (Friedman and Brownell, 1995). The inconsistency of the results also reflected an inconsistent phenomenon. Indeed, the effects of being affected by obesity vary between people and, therefore, obesity can create serious psychological, emotional and psychosocial problems in some individuals, minor distress in others and possibly no disturbance in still others. In general, first generation studies have collectively suggested that obesity per se is not directly associated with psychological distress but this association is mediated and moderated by other conditions. Research on the psychological and psychosocial correlates of obesity has therefore progressively entered the second generation and researchers have begun to study the factors which, in the heterogeneous population of people with obesity, seem to increase the risk of developing a psychopathology (Friedman and Brownell, 1995) . The best evidence was gathered in some studies conducted on large representative samples of the population, mainly American, and suggested that women with obesity, but not men with obesity, have higher levels of depression and suicidal ideation than their normal weight counterparts (Istvan *et al* ., 1992; Carpenter *et al*., 2000). Being a woman, as suggested by the studies cited above, can be considered a risk factor. Even severe obesity (BMI > 40) and comorbidity with binge eating disorder (BED) are consistently associated with an increased risk of psychopathology. Research has also documented a long series of psychological and physical vulnerabilities associated with obesity, such as low self-esteem and negative self-perceptions, body image disturbances (Stunkard and Wadden, 1992), sexual problems (Assimakopoulos *et al*., 2006; Kolotkin *et al*., 2006), eating disorders (Davin and Taylor, 2009), less social contact (Bocchieri et al., 2002) and early trauma.

3. Obesity Metabolic Phenotypes

On the contrary, the focus in medicine has long been on individual differences. Obesity has been studied biologically to identify inter-individual differences in order to provide the patient with the best treatment and increase the chance of a more favourable outcome.

Some nutrition experts have proposed to classify the patient suffering from obesity into phenotypes (Blundell & Cooling, 2000). In particular, four phenotypes of obesity have been described (De Lorenzo *et al*, 2016):

1. normal weight obese (NWO);
2. normal weight metabolically obese (MONW);

3. metabolically healthy obese (MHO);
4. metabolically unhealthy obese (MUO).

The NWO type presents: normal BMI, high percentage of fat with levels typical of obese subjects and associated with a high level of vascular inflammation, which greatly increases the risk of cardiovascular disease. A higher prevalence is found with increasing age and is more frequent among women than men. Arguably, all women older than 55 years with a BMI < 25 are considered NWO. They have elevated blood pressure, elevated fasting glucose, and a worse lipid profile than healthy normal-weight subjects. They appear to be sarcopenic especially in the lower limbs. They do not show metabolic syndrome and have a high level of oxidative stress. Finally, they have a low basal metabolic rate.

The MONW type has normal BMI, normal weight, normal BMR, but demonstrate metabolic characteristics more prone to the development of metabolic syndrome. They have characteristics typical of obese people: high visceral fat, high fat mass, low lean mass, low insulin sensitivity, high concentration of triglycerides, fatty liver disease and chronic degenerative diseases. It is a more frequent condition in men and when it concerns women it is typical of subjects with polycystic ovary syndrome (PCOS). Often these are smokers, hypertensives, who perform little physical activity, with high levels of C-reactive protein (CRP), tumor necrosis factor (TNF-α) and IL-6 and low levels of HDL and adiponectin.

The MHO type demonstrates: an unequivocally obese phenotype, but without any metabolic abnormality. In fact, they have an excess of adipose tissue and a metabolic profile characterized by high insulin sensitivity, an optimal lipid profile and no signs of hypertension. They have a normal BMR and the inflammatory profile is also normal. This condition is often seen in healthy postmenopausal women. Making a comparison with healthy subjects of normal weight, although the parameters are all in the normal range, there are still slightly higher levels of fasting glucose, triglycerides, CRP, LDL and systolic blood pressure and a lower fiber intake and less physical activity. In any case, these subjects demonstrate an increased risk of contracting cardiovascular disease within fifteen years of the diagnosis of MHO and of metabolic syndrome at ten years. However, it has been observed that they are subjects with hepatic steatosis and elevated high sensitive C-reactive protein (hs-CRP) levels.

The MUO type is characterized by high BMI, high percentage of fat mass, high concentration of visceral adipose tissue, low BMR, high incidence of metabolic syndrome, type 2 diabetes mellitus, atherosclerosis and cardiovascular disease. They have high insulin resistance, an altered lipid profile, fatty liver disease, and elevated levels of inflammation.

4. Individual differences in Obesity history

According to the NIH guidelines Patient candidates for bariatric surgery can be subjects with a BMI > 40 kg/m², with a history of repeated failures in weight control treatments or subjects with a BMI >35 kg/m², but with comorbidities (Yermilov *et al.*, 2009).

As known, the intervention includes a pre-surgical psychological assessment phase useful for promptly identifying any major psychiatric disorders in progress, including, first and foremost, the presence of eating disorders. However, the

evaluation, as recommended in the guidelines of the Italian Society of Surgery of Obesity (SICOB), also includes a phase of medical history collection of the history of development of weight problems (Busetto *et al.*, 2011).

In clinical practice subjects responded very differently to the question "when did the weight problems start?". In fact:

1. a first group of subjects reports being affected by obesity from the entire life, and to be on a "constantly diet" condition (or an alternation of weight loss and regain);
2. a second group characterized by having been normally weight, up to a precise moment, and begun to accumulate weight "after a stressful life event".

There are thus two possible types of individual affected by obesity:

- The individual affected by obesity from birth, who has a history of failures in weight control, probably already started in childhood, but with a quite stable body image (Micanti *et al.*, 2016).
- The individual suffering from obesity following a traumatic life event, who had experience of the normal weight self and could have used food as a coping strategy for stress (Dalle Grave, 2007).

In more than 220 clinical interviews using the Paykel Life Event Scale (1997), the stressors that triggered the weight gain were identified as:

Most reported Life events among people affected by obesity
Maternal / paternal mourning
Brotherly mourning
One or more abortions
Loss of a child
Pregnancy / postpartum
Marriage
Job loss
Divorce / Separation
Broken bone / accidents / health problems with ospedalization
Moving to another city

Many patients suffering from obesity report that the difficulties in weight control began following a life experience experienced as traumatic. However, to our knowledge, there are no studies that have explored the possible presence of psychological subtypes among patients affected by obesity based on weight history. Most of the studies compared obese subjects with subjects of normal weight (Abilés *et al.*, 2010), or subjects with obesity with and without Binge Eating Disorder (BED) (de Zwaan *et al.*, 2003; Rieger *et al.*, 2005) . These subjects could therefore also have a different motivation for the request for intervention and different paths of adherence and compliance after the weight reduction

intervention eg. sleeve gastrectomy.

Given these premises, it would be important to understand whether there may be different psychological phenotypes based on the individual history of subjects affected by obesity. The results support the existence of two profiles, which when compared are worse, from a psychological point of view, when subjects develop a weight pathology after a life event.

5. Obesity, life stressors and emotional abuse

Studies have shown that experiencing emotional or behavioral abuse in childhood appears to increase the risk of obesity in adulthood. In particular Hemmingsson, Johansson & Reynisdottir, S. (2014) conducted a meta-analysis of 23 studies that included a total of 112,000 participants. The study found that childhood physical abuse increased the risk of obesity by 28 percent, emotional abuse by 36 percent, sexual abuse by 31 percent, and unspecified abuse by 45 percent. percent. Overall, those who have experienced severe abuse have a 50 percent risk of obesity compared with 13 percent for those who have experienced moderate abuse.

Again Hemmingsson (2014) hypothesized that stressful life events leave traces that can manifest later in life through physical illnesses. Negative events would lead to greater stress on a physiological level, with consequent negative thoughts and emotions, in association with a possible increase in inflammation in various body components, a lowering of the immune system and metabolism associated with obesity.

These life events, therefore, would have a negative impact on the regulation of appetite, metabolism and eating behaviour up to modifying a series of habits which may lead to the onset of obesity.

Several authors have hypothesized that emotional eating may be a coping response to a stressful event. Going into more detail, it would not be the event itself that causes the behavioural response, but its negative interpretation towards the emotional response. The concept of interoceptive awareness in fact includes both the aspect of lack of clarity with respect to the emotion felt, but also the non-acceptance of the emotion felt.

Recent studies have demonstrated a strong association between interoceptive awareness and body image. Researchers have found that people who can sustain attention to their body's internal cues tended to report higher levels of positive body image (Todd *et al.* 2019). People who trust their body's internal signals, such as heart rate or feeling uncomfortable or hungry, are more likely to have a positive view of their body and are less concerned about being overweight (Szulc, 2019).

6. Surgical and Treatment outcomes

It is important to underline how the emotional aspects have a fundamental "weight" in the success of the intervention and maintenance of weight loss. The surgical action alone fails to modify in the long term those dysfunctional attitudes that

have been the cause of the problematic relationship with food. The literature tells us that in some cases bariatric surgery has proved unsuccessful in terms of weight loss (Van Hout *et al.*, 2006). Typically patients show a 50-60% reduction two years after surgery but, unfortunately, about 20% of them fail to lose a significant percentage of weight. This failure is very often attributable to psychological factors (Busetto *et al.*, 2005). Therefore, despite the benefits of bariatric surgery, psychological and behavioural factors, likely, they play an influential role in postoperative outcome.

At the same time, with regard to the emotional consequences of a state of obesity, a study conducted in America at the UCSD Medical Center (Russo, 2017) evaluated how surgery can, in some way, influence psychological and emotional factors of patients, such as eating behaviour, mood, anxiety, and quality of life. The results showed that, after the intervention, people tended not to overeat anymore in response to negative emotions, in parallel with a decrease in depressive and anxious symptoms. Quality of life improved even though, being a pilot study, the results were based as close as 6 months postoperatively.

It is clear, therefore, that the psychological component is associated with a constellation of physical, psychic and behavioural variables which, if on the one hand allow the identification of common elements in the obesity "syndrome", on the other leave ample opportunity for considering the person can be explained and treated only if we take into consideration individual history and inner experience.

7. Conclusions and psychotherapeutic indications

The possibility of identifying a potential psychological phenotype during the clinical pre-surgical psychological interview, provides the clinician a tool to identify the most indicated intervention and support strategies, focused on increasing post-operative success. These observations could help to reduce stigmatization that exist about people with obesity, the incidence of life events shows that obesity is caused by many factors and not only by overeating or a sedentary lifestyle. The holistic approach is highly recommended and should be adopted in the psychological treatment and prevention of obesity, with a particular attention to the individual's development and to the psychological and emotional aspects connected to patients' history.

The present findings add further empirical data to the literature on the role of life events in the development of obesity, a population often neglected and stigmatized. Individuals with obesity have different histories with different psychological and psychotherapeutic needs.

Therapists and mental health professionals have at their disposal evidence-based treatments such as CBT-OB therapy (Dalle Grave, Sartirana & Calugi, 2020). Considering these observations, however, some reflections can be raised. With regards to the population of people suffering from obesity since ever, the results suggest that they might benefit from cognitive-behavioral therapies focusing on emotional regulation such as Marsha Linhean's DBT, especially for "suffering tolerance" and "crisis survival" skills. With regards people with obesity starting from life events, who have different characteristics and specific needs, a programme focused on trauma healing, such as EMDR, might be more indicated (Shapiro, 2014) as demonstrated by recent study on the effectiveness on EMDR in the treatment of obesity (Cairns,

2018). Awareness of individual differences can point to increasingly targeted pre- and post-surgical prevention and may decrease prejudice and care disparity in psychological treatments.

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Conflicts of Interest

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Note

The Interview for Recent Life Events - IRLE by Paykel and co-workers (1997), takes into consideration the last six months and divides the events into 10 categories (work, education, economic problems, health, bereavement, emigration, sentimental life, legal problems, family relationships and marital area) and of each event requires to assess (on a scale from 1 to 5) the independence from the illness and the objectively negative impact; the assessment is carried out by means of a semi-structured interview and subsequently validated by means of a score freely attributed by the patient. The items of the Paykel scale with their normative value. In the Italian version, edited by Fava and Osti (1982), the items were increased to 63.

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