Barovariability

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Abstract

Barovariability is defined as the variation or changes that occur in weight, over a specific time frame, in persons living with obesity or overweight. This includes physiological alteration in weight, as well as pathological weight cycling or yo yo phenomenon. Barovariability can be diagnosed by regular weight and body composition monitoring, and may be predicted by artificial intelligence (AI) tools. Barovariability is associated with adverse psychosocial as well as biomedical outcomes. A realistic and rational approach towards weight management can help prevent and mitigate barovariability.

Keywords: GLP1RA, obesity, overweight, psychosocial weight management, behavioural therapy.

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Variability In Physiological Glycaemia

The concept of glycaemic variability is well understood.[1] Glycaemic variability, i.e., the intra-individual changes that occur in ambient glycaemia over a particular time frame, can be measured and monitored objectively. Association has also been demonstrated between such variability and adverse micro, as well as macro-vascular outcomes. In hypertension management, too, the phenomenon of nocturnal non-dipping, and its associated complications, is well-known.[2] Autonomic health appreciates the physiology of heart rate variability, and its loss as an early marker of autonomic neuropathy.[3]

Variability In Weight

A similar situation occurs in weight homoeostasis as well. Weight loss is a challenging task for person living with obesity.[4] Weight maintenance, however, is even more daunting. This is why weight gain, weight cycling, and the yo-yo phenomenon, occur frequently in persons trying to manage their weight.[5] Such episodes will become more frequent with the availability (and affordability) of potent weight loss drugs. These drugs may be used, and then discontinued, for variable periods of time, leading to varied patterns of weight behaviour. Such patterns are depicted in Figure.

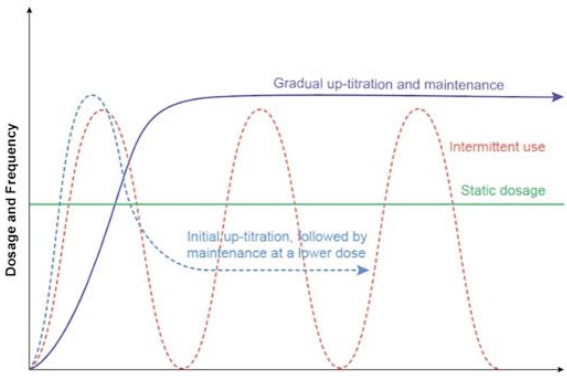

Figure: Pattern of anti obesity medication use

Definition

We propose the term barovariability as an umbrella term to describe the different variations in weight that may occur in a person living with obesity.

Barovariability may be defined as the variation or changes that occur in weight, over a specific time frame, in persons living with obesity or overweight. Barovariability may be circadian, infradian or ultradian in nature, may or may not be related to lifestyle, pharmacological therapy, or invasive procedures, and may or may not be linked to variation in other metabolic and health-related parameters. Barovariability may be unidirectional, i.e., a variable, but sustained, increase or decrease in body weight, or bidirectional, i.e., characterized by both weight loss and gain. (Box)

Barovariability may be visible not only in terms of total body weight, but as change in body composition. Body fat mass may change, even though total weight remains constant. This phenomenon is noted at menopause, and after cessation or during interrupted use of anti-obesity

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BOX: Barovariability

DEFINITION: the variation or changes that occur in weight, over a specific time frame, in persons living with obesity or overweight.

TIMEFRAME

Physiological

Circadian: increase on weight towards evening

Infradian: increase in weight after a heavy meal/ due to constipation/urinary retention.

Ultradian: increase in weight during luteal/ premenstrual period.

Pathological

- Rebound weight gain after stopping intensive lifestyle measures/ ketodiets/pharmacology therapy.
- Weight gain due to concomitant medication, e.g., corticosteroids, atypical antipsychotics.
- Weight gain due to bariatric surgery failure
- Weight loss due to prolonged fasting, whether for salutogenic or religious purposes
- Weight cycling due to intermittent restrictive diets.

medications.

Clinical Implications

While some barovariability is physiological (Box), extreme barovariability can be associated with adverse events. These include reduction in lean body mass, worsening of sarcopenia, osteopenia, cardiovascular events, cholelithiasis, and impaired quality of life.

Barovariability can be prevented and managed by appropriate education and counseling, as well as pragmatic use of therapy (Table) Awareness about this aspect of weight maintenance is the first step towards its mitigation. The phenomenon can be prevented and managed by appropriate counselling and care (Table).Slow, sustained management strategies, along with continuous, comprehensive counseling and support, are the best way of preventing and managing barovariability.

Table: Management of barovariability

Pathological

- Explain the phenomenon, and its adverse outcomes to all stakeholders
- Explain the concept of metabolic set point
- Set realistic goals and time frame
- Start low, go slow in therapy
- Add newer modes of therapy in stepwise manner.
- Intensify drug therapy in stepwise manner.
- Do not discontinue treatment suddenly

As the obesity treatment landscape evolves, so will our understanding, and management, of barovariability.

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