

Visfatin as a Promising Marker of Metabolic Risk

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ABSTRACT:

Beyond energy storage, adipose tissue is an active endocrine organ in which adipocytokines are secreted, which have specific effects on various biological processes such as metabolic homeostasis, immunity and inflammation. However, excess energy accumulated in the body changes the size, distribution and cellular composition of adipose tissue, causing deterioration in its structural and functional functions. In this situation, beneficial adipocytokines are down-regulated, while leptin and other proinflammatory adipokines are highly up-regulated. Visfatin, also known as nicotinamide phosphoribosyl transferase (Nampt), is a proinflammatory cytokine intensely expressed in adipose tissue. Accumulating evidence focuses on the potential role of visfatin in the pathogenesis of metabolic diseases and related complications, suggesting that it may be a promising molecule. However, the contradictory results of the studies show that our understanding of visfatin is still speculative, but its secretion mechanism and physiological role are not fully understood. In this review, the role of this promising molecule in metabolic diseases is explained by presenting comprehensive information about visfatin/Nampt.

Keywords: Metabolism, obesity, risk factor, visfatin

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1. BACKGROUND

The function, molecular targets, and potential clinical significance of recently identified visfatin expressed in adipose tissue have not yet been adequately clarified due to conflicting findings. In addition to being a prominent biomarker in inflammation, clinical evidence supporting its role in various metabolic diseases is increasing. It is an adipocytokine with beneficial effects as an insulin-mimetic, which also has glucose-lowering properties. Elevated serum visfatin has been associated with increased adipose tissue mass in obesity, PCOS, and metabolic syndrome. Considering the increasing morbidity and mortality rates in metabolic diseases; Further research is needed regarding the effect of visfatin and its therapeutic target potential.

2. INTRODUCTION

Beyond energy storage, adipose tissue is an active endocrine organ in which adipocytokines are secreted, which have specific effects on various biological

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processes such as metabolic homeostasis, immunity, and inflammation [1]. However, excess energy accumulated in the body changes the size, distribution, and cellular composition of adipose tissue, causing deterioration in its structural and functional functions [2]. In this situation, beneficial adipocytokines are down-regulated, while leptin and other proinflammatory adipokines are highly up-regulated. Visfatin in 1994 by Samal et al. It is an adipocytokine with 491 amino acids, weighing 52 kDa, defined as the “pre-B cell enhancing factor (PBEF)” protein that stimulates B-lymphocyte formation in the bone marrow [3]. The protein, also known as nicotinamide phosphoribosyl transferase (Nampt), was later determined to be secreted predominantly in visceral adipose tissue and was changed to "visceral fat protein" visfatin. Apart from adipose tissue, it is effective in various biological activities in a paracrine or endocrine manner expressed in hepatocytes, myeloblasts, immune cells, heart and pancreas [4]. Accordingly, studies have focused on the potential role of visfatin in the pathogenesis of metabolic diseases and related complications. It has been reported that increased visfatin serum levels are associated with diseases such as obesity, diabetes and insulin resistance [5]. Despite the contradictory results of recent studies showing that our understanding of Visfatin is still speculative, its secretion mechanism and physiological functions are not fully understood.

3. DISCUSSION

Visfatin is a versatile molecule that plays an important role in many physiological and pathophysiological processes, especially in maintaining metabolic homeostasis and inflammation [3]. Studies have focused on the potential role of visfatin in the pathogenesis of metabolic diseases and related complications. While various studies indicate that plasma visfatin levels are increased in obesity, type 2 diabetes and metabolic syndrome, on the contrary, some studies have claimed that plasma visfatin levels are unchanged or even lower in obesity and type 2 diabetes compared to healthy controls [4,5]. In addition, circulating Visfatin levels and body mass was investigated in the study. A significant correlation between index and body fat percentage was found [6]. Jin et al. In their study, it was determined that visfatin levels were significantly increased in obese adolescents [7]. We sought to elucidate the underlying molecular mechanisms associated with increased visceral adipose tissue insulin resistance and type 2 diabetes [8].

Similar to insulin, visfatin stimulates glucose uptake in adipocytes and myocytes, while inhibiting glucose release from hepatocytes [3]. It has been suggested that visfatin, which has a glucose-lowering effect by binding to the insulin receptor, may play a role in the pathogenesis of diabetes.

In the study investigating the relationship between serum visfatin and insulin and magnesium in patients with type 2 diabetes without insulin resistance, it was determined that visfatin level was significantly higher in the study group than in healthy controls [9].

Polycystic ovary syndrome (PCOS) is a common hormonal disorder associated with insulin resistance and obesity among women [10]. Some of the studies evaluating the correlation between serum visfatin levels and some metabolic parameters in non-obese women with PCOS and controls found serum visfatin levels in PCOS patients and controls to be similar [10, 11] while other studies found higher visfatin levels in PCOS patients [12].

Conflict of Interest

Author has no personal financial or non-financial interests.

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