**ASPROSIN IN METABOLIC SYNDROME**

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**Abstract:** Metabolic Syndrome (MetS) is a cluster of clinical features that include insulin resistance, obesity, impaired fasting glucose and elevated blood pressure. Asprosin is a recently discovered adipokine having 140 amino acid C-terminal profibrillin (encoded by FBN1) and is mainly synthesised and released by white adipose tissue during fasting. Asprosin is associated with regulation of both glucose and lipid metabolism, and insulin resistance. Asprosin is considered to play a complex role in metabolic disease. In recent studies, it is found that serum asprosin levels are increased in T2DM, obesity and polycystic ovary syndrome, which are associated with increased fasting glucose and triglyceride. As MetS is strongly associated with lipid homeostasis, glucose and insulin resistance, serum asprosin levels are altered in MetS.

**Keywords:** Asprosin, metabolic syndrome, obesity, PCOS, CVD.

**Introduction:** Metabolic Syndrome (MetS) is a cluster of risk factors that include insulin resistance, obesity, impaired fasting glucose, increased triglycerides, decreased high density lipoprotein and increased blood pressure. It has become one of the major public health challenges worldwide. In India, prevalence of MetS among adults is about 20% to 25%. Asprosin is a novel adipokine, encoded by two exons (exons 65 and exons 66) of the fibrillin 1 (FBN1). It plays an essential and complex role in metabolism and metabolic diseases.

**Asprosin in Obesity:** Asprosin plays a crucial role in obesity. In the hypothalamus asprosin enhances the activity of Agouti related peptide neurons by a G protein cAMP-Protein Kinase A axis and increases the food intake. It also inhibits the activity of pro-opiomelanocortin neurons stimulating the food intake. In some studies, it is found that serum levels of asprosin are increased in adults with obesity. However, data among children is conflicting as in some studies asprosin levels are decreased in obese children in the age group 6 to 14 years.

**Asprosin in Diabetes:** The essential pathological features of type 2 Diabetes Mellitus include insulin resistance, elevated fasting and post prandial blood glucose levels and β cell dysfunction. In the skeletal muscles asprosin impairs the insulin sensitivity by activating PKCδ/SERCA 2 mediated ER stress/inflammatory pathway leading to insulin resistance. In the liver, asprosin acts via the (OLFR73) G protein coupled receptor and stimulates G protein cAMP-PKA axis which increases the glucose levels. In the β cells of pancreas asprosin binds to toll like receptor 4 through TLR4/JNK- mediated pathway to increase ROS production and pro-inflammatory cytokines promoting inflammation and apoptosis of β cells which leads to decrease insulin secretion. Due to these various actions of asprosin, its level increases in T2DM. Recent studies now more focused on the relation between concentration of asprosin and insulin resistance.

**Asprosin in Polycystic ovarian disorder:** PCOS is a disorder of endocrine and metabolism. In PCOS, obesity particularly the central obesity plays an important role. Clinical manifestations of PCOS include increase androgen levels, ovarian dysfunction and metabolic dysfunction. Some studies showed elevated levels of asprosin in women in PCOS compared to control groups. But effects of asprosin in the aetiology of PCOS is still controversial as in some studies the relationship between circulating asprosin levels and PCOS is non-significant.

**Conclusion:** Asprosin is a novel adipokine that is mainly associated with metabolic syndrome. Its levels are pathologically elevated in T2DM, insulin resistance, PCOS and obesity patients. So, decreasing the level of asprosin may be protective or may improve these metabolic diseases and it might serve as a diagnostic and therapeutic target in MetS. However, it also has a protective role in cardiovascular disorder and may be used as a biomarker in future. As asprosin is a recently discovered adipokine and its knowledge is limited, further more studies are required as many aspects of its physiological and pathophysiological activity needs to be discovered.

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