Boosting immunity: The role of glp-1 receptor agonists in disease management.

Miraa Najmi*

Department of Clinical Sciences, Touro University California College of Pharmacy, Vallejo, California

Introduction

The immune system plays a crucial role in defending the body against harmful invaders, such as bacteria, viruses, and other pathogens. It is a complex network of cells, tissues, and organs that work together to protect the body. However, in some diseases, the immune system may become impaired or overly activated, leading to chronic inflammation or autoimmune conditions. Recent research has uncovered a potential new avenue for supporting immune health: GLP-1 receptor agonists (GLP-1 RAs). These medications, primarily known for managing type 2 diabetes, are showing promise in not only regulating blood sugar levels but also in modulating immune function and offering potential benefits in disease management [1].

GLP-1 receptor agonists are a class of drugs that mimic the action of glucagon-like peptide-1 (GLP-1), a hormone that is naturally produced in the gut. GLP-1 plays an essential role in regulating blood sugar levels by stimulating insulin secretion when blood glucose levels rise and inhibiting glucagon release (a hormone that increases blood sugar). In addition, GLP-1 slows gastric emptying, reduces appetite, and can improve cardiovascular health. GLP-1 receptor agonists, such as liraglutide, semaglutide, and dulaglutide, have become widely prescribed for the treatment of type 2 diabetes due to their ability to lower blood glucose levels and assist in weight loss [2].

However, recent studies have revealed that GLP-1 receptor agonists may also exert significant effects on the immune system, leading researchers to explore their potential in immune modulation and disease management beyond diabetes [3].

The interaction between GLP-1 and the immune system has been a focus of increasing interest in recent years. GLP-1 receptors are not only present in the pancreas but also on various immune cells, including T-cells, B-cells, and macrophages. When GLP-1 binds to these receptors, it can influence immune responses in a variety of ways [4].

Chronic inflammation is a hallmark of many diseases, including cardiovascular disease, autoimmune disorders, and metabolic conditions. Studies have shown that GLP-1 receptor activation can reduce the production of pro-inflammatory cytokines. These cytokines are molecules that promote inflammation and are involved in the development of chronic diseases. By reducing their secretion, GLP-1 RAs may help mitigate inflammation, which is often at the root of conditions like rheumatoid arthritis, Crohn's disease, and even neurodegenerative disorders [5].

GLP-1 receptor agonists have also been shown to modulate the activity of various immune cells. For example, GLP-1 RAs can influence the differentiation and function of T-cells, which play a central role in the body's immune response. They may promote the development of regulatory T-cells (Tregs), which help maintain immune tolerance and prevent the immune system from attacking the body's own tissues. This could be particularly beneficial in managing autoimmune diseases, where the immune system mistakenly targets healthy cells [6].

Chronic metabolic conditions, such as obesity, type 2 diabetes, and metabolic syndrome, are known to compromise immune function. Obesity, in particular, is associated with an increase in inflammatory markers and a decrease in immune system efficiency. GLP-1 receptor agonists help with weight loss, reduce blood sugar levels, and improve insulin sensitivity. As a result, they may indirectly enhance immune function by improving overall metabolic health, which can lead to a more robust immune response [7].

While the emerging research on GLP-1 receptor agonists and immune modulation is promising, there are still several challenges to overcome. Most studies have been conducted in animal models, and more clinical trials in humans are necessary to fully understand the impact of GLP-1 RAs on immune function. Additionally, while the anti-inflammatory effects are encouraging, it is unclear whether these medications can provide long-term benefits in diseases where inflammation plays a central role [8].

Moreover, the use of GLP-1 receptor agonists in patients with autoimmune diseases or other conditions that require immune modulation must be carefully considered. The risk of infections, for example, could be higher in patients whose immune response is altered by medication. Therefore, further research is needed to explore the safety and efficacy of these drugs in broader patient populations [9].

GLP-1 receptor agonists have also been shown to modulate the activity of various immune cells. For example, GLP-1

***Correspondence to : **Miraa Najmi**, Department of Clinical Sciences, Touro University California College of Pharmacy, Vallejo, California. E-mail: mra@njm

***Received:** 30-Aug-2024, Manuscript No. AADY-25-158381; **Editor assigned:** 02- Sep -2024, PreQC No. AADY-25-158381 (PQ); **Reviewed:** 11- Sep -2024, QC No. AADY-25-168381;**Revised:** 16-Sep-2024, Manuscript No. AADY-25-158381; **Published:** 25- Sep -2024, DOI: 10.36841/aady-8.5.227*

***Citation:** Najmi M: Boosting immunity: The role of glp-1 receptor agonists in disease management. J Diabetol. 2024;8(5):227*

RAs can influence the differentiation and function of T-cells, which play a central role in the body's immune response. They may promote the development of regulatory T-cells (Tregs), which help maintain immune tolerance and prevent the immune system from attacking the body's own tissues. This could be particularly beneficial in managing autoimmune diseases, where the immune system mistakenly targets healthy cells [10].

Conclusion

GLP-1 receptor agonists are no longer just tools for managing diabetes and metabolic disorders. Their potential role in modulating immune function opens up exciting new possibilities for the treatment of various inflammatory and autoimmune diseases. As research continues to uncover the full extent of their effects on the immune system, these medications may become a cornerstone in the management of diseases beyond type 2 diabetes. However, careful evaluation in clinical settings is necessary to ensure their safe and effective use in diverse patient groups.

References

1. Nathan DM. Diabetes: advances in diagnosis and treatment. Jama. 2015;314(10):1052-62.
2. Rother KI. Diabetes treatment—bridging the divide. The New England journal of medicine. 2007;356(15):1499.
3. Bastaki S. Diabetes mellitus and its treatment. International journal of Diabetes and Metabolism. 2005;13(3):111-34.
4. Skyler JS. Diabetes mellitus: pathogenesis and treatment strategies. Journal of medicinal chemistry. 2004;47(17):4113-7.
5. Asche, C., LaFleur, J., & Conner, C. (2011). A review of diabetes treatment adherence and the association with clinical and economic outcomes. *Clinical therapeutics*, *33*(1), 74-109.
6. Suryasa IW, Rodríguez-Gámez M, Koldoris T. Health and treatment of diabetes mellitus. International journal of health sciences. 2021;5(1):1-5.
7. Petrak F, Baumeister H, Skinner TC, Brown A, Holt RI. Depression and diabetes: treatment and health-care delivery. The Lancet Diabetes & Endocrinology. 2015;3(6):472-85.
8. Golbidi S, Alireza Ebadi S, Laher I. Antioxidants in the treatment of diabetes. Current diabetes reviews. 2011;7(2):106-25.
9. Chao EC, Henry RR. SGLT2 inhibition—a novel strategy for diabetes treatment. Nature reviews drug discovery. 2010 ;9(7):551-9.
10. Arauz-Pacheco C, Parrott MA, Raskin P. The treatment of hypertension in adult patients with diabetes. Diabetes care. 2002;25(1):134-47.

Citation: *Najmi M: Boosting immunity: The role of glp-1 receptor agonists in disease management. J Diabetol. 2024;8(5):227*