Editorial

Insulin Neuroprotection: Would We Experience the Second Insulin-Related Turning Point?

Since the late 19th and early 20th centuries, scientists were able to discover things like Langerhans islets, insulin mechanism of action, and the pathophysiology of Diabetes mellitus; this is why people are often familiar with insulin for its endocrine properties. These events are considered an "important milestone in the history of medicine" (1).

But when it comes to cellular and molecular medicine, that's when completely different fields beyond the previous fields reveal themselves for insulin.

In the care of patients during the perioperative period, there are very sensitive organs such as the brain, and any damage to them leads to irreversible damage. Anesthesiologists always face very sensitive and critical challenges in the field of perioperative caring for patients, especially patients with diseases of large organs; with the greatest concern when they want to take care of these patients in terms of brain protection (2).

An important problem in this field is the very short golden time for some body organs such as brain cells. And worst of all, tissues like the brain suffer irreversible damage after the golden time (3).

Regenerative medicine is a transformative and innovative branch of medicine that has taken great steps in the field of theory and research in recent years (4, 5). This branch of knowledge is turning from a distant window into a very large and stunning source of light that can solve many dead ends and blind spots in today's medical knowledge (6). The field of anesthesiology and intensive care is not an exception to this rule (2, 4).

In this issue of the JCMA, an article by Tofighi Zavareh et al has been published that shows how this familiar and everyday insulin at the bedside can create significant hopes in the field of regenerative medicine regarding the preservation of brain tissue cells (7). They showed how insulin can lead to a significant difference in the number of brain tissue cells compared to the control group in the mice under study, in favor of those mice who received insulin. In addition, insulin led to a significant difference in the level of expression in the NSR, PI3K, AKT, IGF-1, and FOXO-1 genes; with a significant increase in their expression in the mice group who had received insulin.

The neuroprotective effect of insulin has been demonstrated in this study by "measuring the expression of genes that take part in the neuronal cell apoptosis process", leading to the finding that insulin could improve brain function after being exposed to various damage factors.

We should have a new look at many of our current pharmaceuticals which would involve other drugs besides insulin (8). However, there is a very high probability that we would experience the "second important insulin-related milestone in the history of medicine".Understanding the changes in the function and spatiotemporal patterns of these ion channels' expression could be the key to controlling the nociception excitability and, eventually, how to alter the pain status.

References

1. Vecchio I, Tornali C, Bragazzi NL, Martini M. The Discovery of Insulin: An Important Milestone in the History of Medicine. Front Endocrinol (Lausanne). 2018;9:613.
2. Tabashi S, Tajbakhsh A, Dahi M, Dabir S, Vosoughian M, Moshari M. Regenerative Medicine And Perioperative Hypoxic Organ Damage: Targeting Hypoxia-Inducible Factors. J Cell Mol Anesth. 2021;7(1):58-65.
3. Tajbakhsh A, Tabashi S. Apoptosis, Autophagy, and Anesthesia; Correlation of the Three "A"s. J Cell Mol Anesth. 2021;6(1):1-2.
4. Dabbagh A. Regenerative Medicine: Fact or Myth? J Cell Mol Anesth. 2022;7(1):1.
5. Buchheit T, Huh Y, Maixner W, Cheng J, Ji RR. Neuroimmune modulation of pain and regenerative pain medicine. J Clin Invest. 2020;130(5):2164-76.
6. Margiana R, Markov A, Zekiy AO, Hamza MU, Al-Dabbagh KA, Al-Zubaidi SH, et al. Clinical application of mesenchymal stem cell in regenerative medicine: a narrative review. Stem Cell Res Ther.

2022;13(1):366.
7. Tofighi Zavareh MA, Kargar Godaneh MH, Eslahi P, Aliaghaei A, Asghari MAA, Z., Payvandi AA, et al. Insulin Can Improve the Normal Function of the Brain by Preventing the Loss of the Neurons. J Cell Mol Anesth. 2022;7(4):197-202.
8. Zali H, Golchin A, Farahani M, Yazdani M, Ranjbar MM, Dabbagh A. FDA Approved Drugs Repurposing of Toll-Like Receptor4 (TLR4) Candidate for Neuropathy. Iran J Pharm Res. 2019;18(3):1639-47.

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