Acta Scientific Pharmaceutical Sciences

Volume 1 Issue 6 December 2017

Opinion

Drugs Acting on Imidazoline Receptor are Still in Infancy for Treating the Diabetes Mellitus

Marwan S Al-Nimer[1,2,3]*

[1]*Visitor Professor of Pharmacology, College of Pharmacy, Hawler Medical University, Erbil, Iraq*

[2]*Visitor Professor of Pharmacology, College of Medicine, Sulaimani University, Sulaimani, Iraq*

[3]*Professor of Pharmacology, College of Medicine, Al-Mustansiriya University, Baghdad, Iraq*

***Corresponding Author:** Marwan S Al-Nimer, Visitor Professor of Pharmacology, College of Pharmacy, Hawler Medical University, Erbil and Visitor Professor of Pharmacology, College of Medicine, Sulaimani University, Sulaimani, and Professor of Pharmacology, College of Medicine, Al-Mustansiriya University, Baghdad, Iraq.

Received: September 19, 2017; **Published:** December 12, 2017

Imidazoline receptors (*I*) are distributed in the central nervous system and in peripheral tissue. They involved in the regulation of the blood pressure and secretion of hormones, including adrenocorticotrophic hormone and insulin. Drugs that are selectively act on *I*-receptor showed pleotropic effects, including anti-inflammatory; protection of central nervous system against stress, pain, convulsion and depression; regulation of body fat; and cell protection against apoptosis and adhesion. Several studies found that there is a heterogenous group of substances that served as a ligand for imidazoline receptors. Canavanine activates the *I*-2 and thereby reduced the hyperglycemia that induced by streptozocin in animal [1]. Allantoin, a byproduct of uric acid and is the primary active substance of the Yam (*Dioscorea* spp.) activates the *I*-3 receptors and it ameliorates the apoptotic changes in the pancreatic beta-cell that induced by streptozocin and thereby attenuates the hyperglycemia [2]. Li., *et al.* [3] found that agmatine an endogenous substance that activates the *I*-3 receptors and protects the beta-cell of the pancreas from the damage that induced by streptozocin [3]. Chronic administration of selective *I*-1 receptor agonists improved the insulin sensitivity and exerted favorable effects upon the components of the metabolic syndrome like metformin [4,5]. Drugs acting on the *I*-receptors improved insulin sensitivity by inhibiting the sympathetic nervous system, stimulation of adiponectin release and activation of the adenosine monophosphate activated protein-kinase (AMPK) pathways in the peripheral tissue [4]. Morin is an active substance of the guava that related to the flavonoids and found to activate the *I*-3 receptors at β-cell of pancreas and thereby increases the release of insulin [6]. Chen., *et al.* [7] found that metformin, the anti-diabetic biguanide-related drug, enhanced the uptake of glucose by peripheral tissue by acting on the *I*-2 receptor and inducing phosphorylation of adenosine monophosphate protein-kinase. Preclinical studies documented the anti-diabetic effects of *I*-receptor agonists, but the researchers did not carry clinical studies to assess the efficacy of these compounds as anti-diabetic and specify the mechanism of action. It is important to mention here that these compounds reduced the blood pressure, therefore, they will be promising agents in the management of metabolic syndrome as they act at least on the two components of metabolic syndrome.

Bibliography

1. Chang CH., *et al*. "Canavanine activates imidazoline I-2 receptors to reduce hyperglycemia in type 1-like diabetic rats". *Chemico-Biological Interactions* 240 (2015): 304-309.

2. Amitani M., *et al*. "Allantoin ameliorates chemically-induced pancreatic β-cell damage through activation of the imidazoline I3 receptors". *PeerJ* 3 (2015): e1105.

3. Li Y., *et al*. "Activation of imidazoline-I3 receptors ameliorates pancreatic damage". *Clinical and Experimental Pharmacology and Physiology* (2015).

4. Weiss M., *et al*. "Imidazoline-like drugs improve insulin sensitivity through peripheral stimulation of adiponectin and AMPK pathways in a rat model of glucose intolerance". *American Journal of Physiology - Endocrinology and Metabolism* 309.2 (2015): E95-E104.

5. Fellmann L., *et al*. "A new pyrroline compound selective for I1imidazoline receptors improves metabolic syndromein rats". *Journal of Pharmacology and Experimental Therapeutics* 346.3 (2013): 370-380.

6. Lin MH., *et al*. "Investigation of morin-induced insulin secretion in cultured pancreatic cells". *Clinical and Experimental Pharmacology and Physiology* (2017).

7. Chen CT., *et al*. "Activation of imidazoline I-2B receptor by metformin to increase glucose uptake in skeletal muscle". *Hormone and Metabolic Research* 43.10 (2011): 708-713.

Volume 1 Issue 6 December 2017