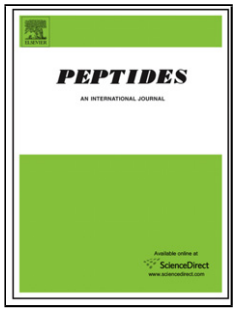

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<AT>The potential benefits of glucagon-like peptide-1 receptor agonists for diabetic retinopathy.

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<ABS-HEAD>Highlights► ►We summarize the benefits of GLP-1RA for DR beyond the hypoglycemic effects. ► GLP-1RA could inhibit nerve damage by decrease apoptosis of nerve cells and activation of glial cells. ► GLP-1RA protects internal blood retinal barrier (iBRB) and outer blood retinal barrier (oBRB).

<ABS-HEAD>Abstract

<ABS-P>For a long time, diabetic retinopathy (DR) has been one of the most severe complications of diabetes. The early treatment of DR is not clearly recognized. The additional benefit of hypoglycemic agents for DR has become a new research field. Glucagon-like peptide-1 receptor (GLP-1R) has been shown to be widely expressed in tissues including retina. Glucagon-like peptide-1 receptor agonists (GLP-1RA) have been generally used in the treatment of diabetic patients. Studies shows that GLP-1RA could inhibit nerve damage by decrease apoptosis of nerve cells and activation of glial cells. In addition, GLP-1RA plays a protective role for tight junction (TJ) and cells of blood retinal barrier (BRB). It also protects retina from BRB damage. In this review, we discuss the potential protective mechanisms of GLP-1RA for DR beyond the hypoglycemic effects.

<KWD>Key words: Glucagon-like peptide-1 receptor agonist; Diabetic retinopathy; Nerve injury; Blood retinal barrier;

<KWD>Abbreviations: GLP-1, glucagon-like peptide-1; GLP-1RA, glucagon-like peptide-1 receptor agonists; DR, diabetic retinopathy; VEGF, vascular endothelial growth factor; DM, diabetes mellitus; Ops, oscillatory potentials; E4, Exenatide-4; GCL, ganglion cell layer; RGC, Retinal ganglion cell; BRB, blood retinal barrier; iBRB,internal blood retinal barrier; ECs, endothelial cells; TJs, tight junctions; RPECs,retinal pigment epithelial cells; PLGF,placental growth factor, VEGF,vascular endothelial growth factor; ICAM-1, intercellular adhesion molecule 1; ROS, oxygen species; ER, endoplasmic reticulum; AGEs, advanced glycation end products; TNF-α, Tumor necrosis factor-α; GlyAlb, glycated albumin; VCAM-1, vascular cell adhesion molecule 1

<H1>1.Introduction

Diabetic retinopathy (DR) is a major microangiopathy that causes vision loss among adults aged 20 to 74 in the developed world [1]. DR is a common