INTRODUCTION

The formation of new capillary blood vessels, a process termed "angiogenesis", is dependent upon coordinate production of angiogenesis promoters and suppressors. Under physiological situations angiogenesis lasts for a relatively short time (days-weeks) then return to a quiescent state through a well coordinated and balanced angiosuppressors and angiopromoters. In contrast, pathological angiogenesis can last for years and somewhat out of control due to imbalance between angiogenic and angiostatic factors (overproduction of angiogenic factors and/or deficiency of angiostatic factors) ***(Mousa, 2000)***.

Dysregulation of vessel growth, either because of an excess or an insufficient number of vessels, has a major impact on our health and contributes to the pathogenesis of many disorders. The first identified and best known angiogenic disorders are cancer and blinding retinopathy ***(Kerbel and Folkman, 2002)***. However, there are numerous other inflammatory, allergic, infectious, traumatic, metabolic or hormonal disorders, which are characterized by excessive vessel growth including choroideal and intraocular disorders, retinopathy of prematurity, diabetic retinopathy and the list is still growing***(Carmeliet, 2005)***.

A decrease in tissue oxygen concentration has long been recognized as a primary cause of angiogenesis. However, the mechanisms underlying the induction of angiogenesis by hypoxia are still poorly understood. Chronic ischemia is clearly an important factor in induction of angiogenesis. For example, myocardial ischemia is known to result in collateral development and opening of preexisting vessels. Neovascularization also occurs in chronic inflammatory lesions and solid tumors, both of which are associated with tissue hypoxia ***(Behzadian et al; 2008)***.

Introduction

Vascular Endothelial Growth Factor (VEGF) is a mitogenic peptide highly specific for vascular endothelial cells; it has been implicated strongly in the pathogenesis of preretinal and sub retinal neovascular membranes, iris neovascularization and other retinal vascular diseases ***(Adamis et al; 1994)***.

When the concentration of VEGF is elevated in ocular fluids of patients with PDR, it is usually associated with increasing or decreasing other growth factors which is known as growth factor profile. So, the angiogenic process represents the net balance between angiogenic stimulators and inhibitors ***(Noma et al; 2002)***.

Current interventions for proliferative ocular disease are based largely on techniques such as laser or cyro ablation of tissue, photodynamic therapy, or surgical techniques that mechanically address the tractional forces associated with neovascular disease. Although these treatments are often successful in halting disease progression, they are destructive and are usually not restorative. As our understanding of the proteins and small molecules that influence angiogenesis increases, so do our options for treatment ***(Stout, 2006)***.