What's New in Retina

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I. Introduction

a. This talk will cover the main advances that have been made in Retina. It will focus on new products that are already in the market and promising products that may soon be on the market.

II. Major diseases to be discussed.

a. Neovascular Macular Degeneration

i. The treatment of choroidal neovascularization (CNV) secondary to AMD began with the advent of thermal laser photocoagulation in the early 1980s.
ii. Almost 20 years later, photodynamic therapy (PDT) with verteporfin was approved by the FDA for the treatment of predominantly classic CNV.
iii. The advent of anti-angiogenic drugs, particularly antivascular endothelial growth factor (VEGF) agents, began with the approval of pegaptanib sodium in December of 2004.
iv. Anti VEGF Drugs

1. Pegaptanib
2. Ranibizumab
3. Bevacizumab

v. New & Emerging Therapies

1. The process by which VEGF is generated and acts upon vascular endothelial cells to stimulate blood vessel growth is a complicated cascade of events. Each of these steps offers the possibility of therapeutic intervention. Activation of this cascade may occur through hypoxia, exposure to certain growth factors, or other inciting stimuli. Multiple molecular interactions then occur, which result in the production of VEGF. One of these key steps in the cascade leading to generation of VEGF involves a molecule known as mTOR, the mammalian target of rapamycin.
2. A number of Anti VEGF agents are being developed to target this portion of the cascade.
    a. Eylea
    b. Sirolimus (rapamycin)
    c. Everolimus
    d. REDD1
    e. KH902
    f. Pazopanib
3. Internal Radiation for AMD: The CABERNET Study

a. Ionizing radiation has the ability to prevent proliferation of vascular tissue by inhibiting neovascularization. After radiation doses as low as 6 Gy, vascular endothelium demonstrates morphologic and DNA changes, inhibition of replication, increased cell permeability, and apoptosis. Fibroblast proliferation and subsequent scar formation, a hallmark of end-stage neovascular AMD, are also inhibited. CNV membranes, which contain endothelial cells that are proliferating due to the hypoxic environment as well as the localized inflammatory cell populations, are more sensitive to radiation damage than is the normal retinal vasculature and nonproliferating capillary endothelial cells.
b. The Vidion ANV Therapy System is a 90Strontium/90Yttrium applicator that is designed to deliver a therapeutic dose of radiation to the CNV while minimizing exposure to other intraocular structures. Following pars plana vitrectomy, the sealed radiation source is placed temporarily over the fovea in the vitreous cavity, via an intraocular cannula, a concept termed "epimacular brachytherapy"

b. Diabetic Macular Edema

i. Diabetic retinopathy is the leading cause of blindness in working-aged adults in the United States. DME is a vision-threatening complication of diabetic retinopathy. The prevalence of DME is related to patients' duration of diabetes.
ii. New & Emerging Therapies

1. 24-Month Results of RIDE and RISE, Two Phase 3 Randomized Trials
    a. Ranibizumab (Anti-VEGF) Improves Vision in Diabetic Macular Edema
2. Iluvien for Diabetic Macular Edema
    a. Three-Year Outcomes for the Fluocinolone Acetonide in Diabetic Macular Edema (FAME) Trial
3. Clinical Application of DRCR.net Anti-VEGF Treatment and Follow-up of Diabetic Macular Edema

c. Polypoidal Choroidal Vasculopathy

i. Polypoidal choroidal vasculopathy (PCV) is a macular disorder characterized by recurrent hemorrhage within the retina and retinal pigment epithelium (RPE).
    1. ICGA is the gold standard of diagnosis of PCV.

ii. New & Emerging Therapies

1. Anti-VEGF Therapy
2. PDT-Ranibizumab Combination Therapy
    a. EVEREST study design

III. Conclusion

a. This lecture will be a comprehensive lecture that talks about the physiology of these diseases and how new strategies have developed to treat patients.