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English summary

The macula comprises less than four percent of total retinal area in humans but is responsible for almost all of our useful, photopic vision. Within the macula, a two millimeters lesion centered on the fovea will affect an estimated 225,000 cones in the average individual, 25 per cent of the total ganglion cell output to the brain, and result in legal blindness.

Age related Macular Degeneration (AMD) is the leading cause of irreversible blindness among individuals aged 55 years and older in the United States and other industrialized countries.

Age related Macular Degeneration is classified into 2 forms: non-neovascular (Dry) AMD (geographic atrophy of Retinal Pigment Epithelium in absence of neovascularization), and neovascular (Wet) AMD (RPE detachment, hemorrhages, and/or peri-Retinal scarring). Non-neovascular (Dry) AMD is the most common form and accounts for approximately 85% of cases while neovascular (Wet) AMD accounts for 15% of cases and is associated with more severe and rapid vision loss. It is important to distinguish between neovascular and non-neovascular AMD because treatment options and prognoses vary among these 2 forms.

Loss of vision from AMD occurs either as a result of choroidal neovascularization with exudation and hemorrhage (the "wet" form) or by slow atrophy of the retinal-pigment epithelium and overlying receptors (the "dry" form).

Other factors under study include (1) cardiovascular risk factors such as hypertension, body mass index, and atherosclerosis (2) dietary risk factors including fat and antioxidant carotenoids - lutein and zeaxanthin - found in dark green or yellow vegetables, but so far these studies have produced conflicting results.

The evidence supporting the hypothesis that metabolic stress is a significant factor in development of macular degeneration is growing. **First**, laser Doppler flowmetry studies have shown that decreased choroidal blood flow is associated with aging and is correlated with decreased density and volume of the choriocapillaris. Furthermore, choroidal volume and flow also decline with increasing severity of features predictive of choroidal neovascularisation.

Second, it has been shown that when choroidal blood flow is reduced experimentally, retinal stress is induced which is established histopathological feature of AMD.

Investigations of AMD patients with large drusen show that they have 33 per cent less choroidal volume and 37 per cent lower choroidal blood flow than age-matched normal controls.

Diagnostic techniques for age related macular degeneration includes: ophthalmoscopic examination, fluorescein angiography, indocyanine green angiography and the optical coherence tomography which is a noninvasive imaging technique that has been used increasingly over the past several years to diagnose and monitor a variety of retinal diseases that affect the macula.

Clinical trials have demonstrated the value of Laser photocoagulation that destroys the new blood vessels, But may also destroy some surrounding

healthy tissue and some vision. Photodynamic therapy PDT with verteporfin slows but does not stop the rate of vision loss. Treatment results are often temporary.

Trans-pupillary thermotherapy (TTT) using a long pulse 810 nanometer infrared Laser beam and submacular surgery with rotation of the retina and removal of the neovasclar membrane are under further investigations.

Intravitreal injection of Anti vascular endothelial growth factor (Anti-VEGF). The cost effective drug promises not only anti-angiogenic capabilities in neovascular eye disease, but has also anti-exudative effects by lowering transendothelial permeability of blood vessels.

Many corticosteroids, including triamcinolon acetonide (TAAC) and anecortave acetate, are potent anti angiogenic agents. The mechanism of action may be due to their effect on vascular endothelial cell turnover, inhibition of the inflammatory response or another means.