

Future studies are needed to further elucidate the mechanism of diabetic retinopathy and to develop a natural history which will make possible a more precise evaluation of present treatment methods.

A grantee study of the condition of retinal capillaries after the death of diabetic and nondiabetic patients may provide a better understanding of the disorder. Investigators found that in addition to retinal microaneurysms, diabetes is characterized by capillary sheathing and a decrease in the ratio of pericyte to endothelial cells. This blood-vessel damage is not evident in clinical examination, for by the time that capillary lesions become so gross as to be recognized clinically in the form of incipient diabetic retinopathy, the patient already has generalized diabetic microangiopathy (disease of the capillaries).

Retinitis Pigmentosa.—Retinitis pigmentosa is an inherited disease that usually produces its first symptom—night blindness—in childhood. Over the years peripheral vision is lost through changes which take place in the retina.

The electroretinogram and a related test, the electroculogram, have provided very sensitive and accurate measurements of retinal damage to patients. These tests have been helpful to Institute scientists in localizing early retinal damage in the rod photoreceptors rather than in the cones.

A recent study suggests that while the light to which human beings are customarily exposed rarely produces permanent damage to normal eyes, people with inherited night blindness may benefit from wearing dark glasses when exposed to bright light. This may be particularly helpful in cases of a chronic progressive degeneration: subjective symptoms are night blindness, contraction of the field of vision, and diminution of sight.

In this study scientists found that albino rats with normal vision when kept around the clock in light of ordinary brightness developed severe night blindness after only 3 to 5 days of exposure. Given longer periods, up to 3 months, of dark adaption afterward, these animals recovered very little of their normal sensitivity to light. The visual cells in their retinas were almost completely destroyed by several days of constant exposure to light.

Retrolental Fibroplasia.—Retrolental fibroplasia (RLF) was once common in premature infants, until it was discovered through an Institute-supported study that the ocular abnormality was related to excess oxygen consumption.

A recent study of experimental retrolental fibroplasia threw new light on the underlying mechanism of this disease which may also aid in understanding other vascular disorders of the retina. It appears that this blinding disorder may be caused by the same mechanism that produces retinitis proliferans (the late stage of diabetic retinopathy) and blindness following retinal vein occlusion.

Investigators used light and electron microscopy and histochemical techniques to study changes (hyperoxia) produced in retinas of premature kittens and other animals by excessive oxygen. Findings suggest that blood vessel proliferation (reproduction of cells and morbid cysts) following hyperoxia might be due to the liberation of some toxic substance by degenerating endothelial vessels.

Recent studies have demonstrated that full-term infants exposed to oxygen therapy are sometimes affected, too. Investigators found that the retina is not fully vascularized until shortly after birth of the full-term infant. Animal experiments have shown that the incompletely vascularized retina is susceptible to oxygen damage.

An Institute workshop planned for 1967 will discuss oxygen use in hyaline membrane disease and its potential for causing RLF.

Diseases of the Conjunctiva

The conjunctiva forms the inner lining of the lids and is contiguous with the lining of the lacrimal apparatus.

Conjunctivitis is a general term covering a number of symptomatic complaints including itching, tearing, and foreign body sensations which are not necessarily due to local conjunctival disease. Conjunctival disorders may be allergic, bacterial, or traumatic. All are inflammatory.

In a 10-year study of kerato-conjunctivitis, a research team recognized 12 distinct clinical and etiologic types of the disease. They learned that adenoviruses are the principal cause of acute follicular conjunctivitis, and herpes simplex virus the principal cause of keratitis. Keratitis and conjunctivitis caused by other viruses were also studied.

Trachoma

Trachoma, a viral disease which produces scarring of the eyelids and opacification of the cornea, is a prolonged progressive disease which spreads through