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LIPOFUSCIN ACCUMULATION IN THE RETINAL PIGMENT EPITHELIUM AND FATTY ACID DIET.

GARCIA-LAYANA A, MORENO J, ALISEDA D, MUNUERA JM, MOYA D, MARTINEZ A. CLINICA UNIVERSITARIA NAVARRA, UNIVERSITY OF NAVARRA, SPAIN.

PURPOSE. To determine the role of fat ingestion in the rate of lipofuscin accumulation in porcine retinal pigment epithelium (RPE). METHODS. Animals were divided into two groups of 6 pigs each. In the first group (Control), a restricted diet was supplied. The second group (Cholestherol) was fed the same nutritional diet but one third was replaced by polyunsatured fatty acid. Serum total cholesterol, HDL, LDL and triglycerides were determined at the beginning and at the end of the experiment. After 12 weeks, the eyes were enucleated and the lipofuscin was determined by autofluorescence. RESULTS. Serum total cholesterol, HDL and LDL, was significant increased in the second group (Cholesterol) ($p<0.01$). No RPE lipofuscin autofluorescence differences were observed beetwen both groups. CONCLUSIONS. In the present hiperlipemic experimental model no increased in RPE lipofuscin accumulation was observed. These results suggest that dietary fat ingestion may not be related with retinal process such as age-related macular degeneration.

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NIGHT BLINDNESS DUE TO CHRONIC PANCREATITIS: VITAMIN A DEFICIENCY DESPITE ORAL PANCREATIC ENZYME THERAPY

SCHLIEBS B. and MITTELVIEFHAUS H.
Department of Ophthalmology, University of Freiburg (Germany)

Purpose We demonstrate a rare clinical entity that can easily be cured after correct diagnosis and appropiate treatment.

Case report A 54-year-old man complained of night blindness for three weeks. For a period of twenty years he had been suffering from chronic pancreatitis with secondary diabetes mellitus, and had been treated with insulin and oral pancreatic enzymes. Due to renal failure, continuous ambulatory peritoneal dialysis (CAPD) was done for one year. Liver function was normal.

Findings Confirming the diagnosis of night blindness in our patient, the scotopic response in his electroretinogram (ERG) was distinctly reduced while the photopic response was normal. When his blood was examined for a low level of vitamin A as a possible cause for night blindness, we found the value to be reduced below normal (17 µg/dl versus 25-70 µg/dl in normal subjects). Treatment with vitamin A supplement resulted in prompt normalization of vitamin A level (79 µg/dl after two weeks). Symptoms completely disappeared, and the scotopic response in the ERG returned to normal.

Conclusion Night blindness due to vitamin A deficiency may occur in patients suffering from pancreatic insufficiency even when pancreatic enzymes are substituted. This therapy does not prevent from deficiency of fat-soluble vitamins (A, D, E, K) in some case. Therefore in patients with acquired night blindness and normal nutrition, the ophthalmologist should consider a malabsorption syndrome with subsequent vitamin A deficiency. In those patients supplementation with vitamin A will restore night vision.

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UBIQUITIN DISTRIBUTION IN THE HUMAN RETINA: AN IMMUNOHISTOCHEMICAL STUDY

LOEFFLER K.U.[1] and MANGINI N.J.[2]
[1]Department of Ophthalmology, Freiburg University, Germany
[2]Department of Ophthalmology & Visual Sciences, UIC College of Medicine, Chicago, IL.

Purpose Ubiquitin (Ub) is a member of the stress protein family and has been shown to be particularly active in the degradation of abnormal proteins which form during stress conditions. We document the presence of ubiquitin in the human retina and present its immunohistologic distribution in various disease processes.
Methods We have studied 27 human retinae from enucleated eyes embedded in paraffin. The specimens comprised 16 cases with melanoma, 7 with end-stage glaucoma, 2 with macular degeneration, 1 with sympathetic ophthalmia, and 1 exenteration with an age range between 40 and 90 years. The tissue was fixed in 4% formaldehyde and processed for paraffin histology. Immunohistochemistry was carried out with an antibody (Ab) against Ub (polyclonal Ab, Accurate chemical [dilution 1:1, 2 hours]) and in some specimens with an Ab against Ub conjugating enzyme (E2, polyclonal Ab, gift from Dr. Banerjee, dilution 1:250, overnight). Immunoreactivity (IR) was tested using the avidin-biotin method, and antibody binding was visualized using either diamino-benzidine (DAB) or aminoethylcarbazole (AEC) as chromogen.
Results In most specimens Ub was present throughout the retina but IR was particularly prominent in ganglion cells, in the retinal pigment epithelium (RPE) and in a patchy fashion in the ciliary epithelium. The most intriguing finding was the presence of ubiquitin in sub-pigment epithelial deposits related to aging such as drusen and BLD while reactive changes overlying tumours were mostly negative. The intensity of immunolabeling of the RPE appeared to increase with age, but otherwise no specific pattern of Ub IR could be identified in the various diseases included in this study. The ubiquitin conjugating enzyme (E2) was demonstrated in the RPE in all sections examined and with some variation also in photoreceptors and the remaining inner retina. In those structures, there was a tendency for anti-E2 to colocalize with Ub. As expected, however, we failed to demonstrate a significant E2 activity in drusen or BLD-like structures.
Comment Ubiquitin appears to be an important substrate in ganglion cells and also in the degradation process and subsequent disposal of proteins from the RPE. Using our method, no obvious difference in immunohistochemical localization was apparent between eyes with different diseases. Subtle changes, however, cannot be excluded and might possibly be demonstrated applying other techniques.

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COMPARISON OF TIGHT JUNCTIONS PERMEABILITY AND MODULATION IN IRIS PIGMENT EPITHELIUM AND RETINAL PIGMENT EPITHELIUM IN VITRO

THUMANN G., REZAI A.K., LAPPAS A., HEIMANN K.
Department of Vitreoretinal Surgery, University of Cologne, Germany

Purpose. Iris pigment epithelium (IPE) and retinal pigment epithelium (RPE) have been found to generate tight junctions. In this study we compared the barrier function and its modulation in IPE and RPE. **Methods**. Human RPE and IPE were cultured on semipermeable filter supports to confluence. The permeability of the two cell lines for albumin was measured by determination of the albumin clearance and compared with filter supports without cells serving as control. The permeability of the tight junctions was modulated with EDTA and their permeance for albumin was measured. **Results**. In cultures treated with normal medium both IPE and RPE restrict the permeation of albumin. After addition of EDTA the permeability was significantly increased similarly in both cell types. **Conclusions**. IPE and RPE are able to build monolayers on filter membranes in vitro. It could be shown that the barrier function of the tight junctions is similar in IPE and RPE. The modulation of tight junctions showed a similar effect on both cell lines. We are currently examining further morphological, functional and structural similarities of IPE and RPE.
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