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Bacterial and Fungal Keratitis: A Retrospective Analysis at a University Hospital in Switzerland

The Aging Retina in the Context of Cerebral Neurodegenerative Diseases

The following scientific publications have been selected and elaborated by Dr. Vera Schmit-Eilenberger
Welcome to the SAoO Congress 2020 in Lucerne and to the SaoO Satellite Congress in Lugano in November 2019

What awaits you at our next SAoO Congress? A well proven format but also a completely new one! A simultaneous plenary session is planned in French on Thursday and Friday as well as industry-sponsored lunch symposia. Once again, we will be offering practical presentations, an OCT course and a number of hands-on events for practice employees and orthoptists.

A new parallel Optometry Day is scheduled on Wednesday. Among the other novelties of the 2020 edition, it is envisaged that the speakers will announce the learning objectives of their presentations in order to maximize the transfer of knowledge. Furthermore, the audience will have additional opportunities to interact with the speakers, not only through the already known voting system, but also by uploading their specific questions, cases or clinical videos to our website in anonymous form.

A selection of these items will be discussed by a panel of experts in the corresponding session. All those wishing to participate in the 3rd SAoO Association’s General Assembly are kindly invited.

We are convinced that the combination of theoretical and practical knowledge, as well as the degree of interactivity of the sessions, form the basis for the success of this congress.

We would like to draw your attention to our OMPA project "Ophthalmic Medical Practice Assistant" which focuses on further education for medical practice assistants in ophthalmology. The project will be presented at the General Assembly of the Swiss Society of Ophthalmology (SSO) in Interlaken on 29 August 2019 (item 13.3 on the agenda). Interested parties will be able to consult the information material on our website: https://www.saoo.ch/en/foundation/projects/

The interview with Dr Michael Bärtschi PhD on the topic of Myopia will be broadcast on Monday, 2nd September at 9 p.m. during the PULS programme of Swiss television SRF1 with the participation of SAoO.

Finally, we announce our SAoO Satellite Congress in Ticino on 14th November 2019 in Lugano for which we would be very happy to see you attend.

Prof. Daniel Mojon
PRESIDENT OF THE PROGRAMME COMMITTEE
Is Myopia associated with the Incidence and Progression of Diabetic Retinopathy?

It was the aim of this population-based cohort study to determine the association of refractive error (RE) and its associated determinants (axial length, anterior chamber depth and corneal curvature) with the incidence and progression of diabetic retinopathy (DR). A total of 1,562 eyes of 840 individuals with diabetes and gradable retinal photographs from the Singapore Malay and Indian Eye Studies, at baseline (2004-2009) and follow-up (2011-2015) examinations were included in the analyses. At follow-up, 164 of 1,273 (12.9%) had incident DR, 17 of 1,542 (1.1%) eyes had incident visual threatening DR, and 75 of 269 (27.9%) eyes with baseline DR experienced progression.

A longer axial length was associated with lower risk of incident DR. No other associations were found. Several mechanistic theories underpinning that protective effect have been so far proposed: e.g. that an elongation of the posterior globe results in stretching and thinning of retinal blood vessels, leading to decreased blood flow.

However, the authors hypothesize that axial elongation results in retinal neurodysfunction, particularly in the outer retina, leading to reduced metabolic demand and a consequent decrease in hypoxic burden.

The findings of this study show that a longer axial length was associated with a lower risk of incident diabetic retinopathy independent of refraction or other biometric parameters.

Effect of Nd:YAG laser posterior capsulotomy on intraocular pressure, refraction, anterior chamber depth, and macular thickness

Generally, the reported incidence of PCO is 20.7% at 2 years and 28.5% at 5 years after cataract surgery. PCO is the most frequent cause of diminished visual acuity after extra-capsular cataract surgery. Nd:YAG laser capsulotomy is the standard treatment of PCO.

The primary goal of this study with 96 eyes of 83 patients was to examine the influence of Nd:YAG laser capsulotomy on BCVA, IOP, SE (spherical equivalent), macular thickness, and ACD, which were noted preoperatively, at 1 hr. postoperatively and at 1-month follow-up.

Patients were divided into two groups based on energy used (Group I ≤50 mJ, Group II > 50 mJ). None of the patients received prophylactic antiglaucoma medications either before or after the procedure. There was no significant change in SE compared to preoperative values in both the groups. The ACD continued to increase significantly in both the groups at both 1 hr. and 1-month follow-up.

In Group I, IOP increased at 1 hr. postoperatively (P=0.023) and declined to preoperative levels at 1 month. In Group II, IOP increased at 1 hr. postoperatively (P<0.001) and did not return to preoperative levels at 1-month follow-up (P=0.003). One patient (from Group II) had a rise in IOP from 18 to 24 mmHg, which normalized on the following day without any glaucoma medication. Likewise, the maximum increment in IOP in Group I was of 5 mmHg, which was observed in a single patient (IOP rose from 10 to 15 mmHg at 1 hr.). There were eight patients with an IOP increment of 4 mmHg at 1 hr. out of which seven were from Group II and one from Group I. None of these patients had an IOP >18 mmHg at 1 hr.

Likewise, macular thickness increased at 1 hr. in both groups (P<0.001). In Group I, macular thickness decreased significantly to preoperative level at 1 month whereas in Group II, it remained significantly high at 1-month follow-up (P=0.006).

There was no case with serious rise in IOP or cystoid macular edema. Apparently, BCVA improves significantly after Nd:YAG laser posterior capsulotomy in otherwise healthy pseudophakic eyes with PCO.

Increase in IOP and macular thickness is common after Nd:YAG laser capsulotomy, whose severity and duration changes regarding with the amount of total energy used. However, this might not necessitate regular prophylactic treatment.

Gene edits to “CRISPR Babies” might have shortened their life expectancy

The scientist who edited the genomes of twin girls in an attempt to make them resistant to HIV might have inadvertently shortened their life expectancy. People with two disabled copies of the CCR5 gene — the version that protects against HIV infection — are 21% more likely to die before the age of 76 than are people with at least one working copy of the gene, according to a study published on 3 June in Nature Medicine. The reason for the discrepancy is unknown.

The analysis is based on genetic and health data from nearly 410,000 people enrolled in the UK Biobank research project. And many scientists questioned He's choice of gene. The latest finding casts further doubt on the wisdom of disabling the gene to protect against HIV, says Philip Murphy, a molecular immunologist at the US National Institute of Allergy and Infectious Diseases in Bethesda, Maryland. "If you’re unlikely to make it to your third birthday, and could go beyond it if you simply edited a specific gene, that would be a risk worth taking," he says. But current treatments for HIV allow many people with the virus to live into old age.

Alcino Silva, a neuroscientist at the University of California, Los Angeles, agrees. "It’s just foolhardy at this point to go ahead and start mutating genes in humans," he says. "No matter how well-intentioned we may be when we design these genetic manipulations, we simply don’t know enough to be doing this at this time. "He would like to see more research on the health of people who lack a working CCR5 gene, which could help to reveal why its function is linked to lifespan. He continues to think that disabling the gene is akin to removing the brakes on a car. “The car would go a lot faster”, he says, “but the risk of harm would be higher.”

Source: Nature 570, 16-17 (2019),doi: 10.1038/d41586-019-01739-w

Study finds no need to delay cataract surgery in patients with elevated hemoglobin A1c

This study explored factors influencing visual outcomes after phacoemulsification in patients with cataracts and type 2 diabetes.

The authors retrospectively assessed the corrected distance visual acuity (CDVA) after cataract surgery in 65,370 patients, of which 34% had diabetes mellitus. The data were further stratified to determine if the duration of diabetes, degree of diabetic retinopathy (DR) or preoperative HbA1c score influenced the level of improvement in CDVA. Patients undergoing a combination procedure or who had preoperative macular edema were excluded from the study.

Of the group with diabetes, 28% had no retinopathy, 5% had non-proliferative DR and 1% had proliferative DR. The analysis revealed a mean 4-line improvement in CDVA in every patient group, regardless of the duration of diabetes, degree of DR or preoperative HbA1c score. The odds of having a postoperative CDVA of 20/25 or worse were not influenced by oral diabetes medication without insulin or an HbA1c score of 9.0% or more.

Patients who had diabetes but no retinopathy had the same odds of achieving a CDVA of 20/20 as patients without diabetes. However, patients with retinopathy had a decreased likelihood of having a postoperative CDVA of 20/20, which decreased as the level of retinopathy increased.

The significance of HbA1c and diabetic retinopathy with respect to the best possible time to perform a cataract surgery is assessed differently. Based on this study, surgeons may not need to delay cataract surgery due to increased HbA1c, especially in patients without DR.

Tempted to cheat on a written exam? Artificial intelligence is 90% certain to nab you

By combining big data and artificial intelligence, researchers can determine whether a piece of scholarly work has been written by students themselves or whether it has been written by a ghostwriter - with an accuracy of almost 90 percent. At the University of Copenhagen’s Department of Computer Science, efforts to detect cheating on assignments through writing analysis by way of artificial intelligence have been underway for a few years. Now, based on analyses of 130,000 written Danish assignments, scientists can, with nearly 90 percent accuracy, detect whether a student has written an assignment on their own or had it composed by a ghostwriter.

The Ghostwriter program is based on machine learning and neural networks - areas of artificial intelligence that are particularly useful for recognizing patterns in images and text.

The program, Ghostwriter, is built around machine learning and neural networks -- branches of artificial intelligence that are particularly useful for recognizing patterns in images and texts.

MaCom, the company that provides Lectio to Danish high schools, has made a dataset of 130,000 written assignments from 10,000 different high school students available to Ghostwriter project researchers at the Department of Computer Science. For now, it is still a research project.

Bacterial and Fungal Keratitis: A Retrospective Analysis at a University Hospital in Switzerland

In this retrospective study, 417 patients with the clinical diagnosis of bacterial or fungal keratitis in 2006/07 and 2015/16 were enrolled. In an additional analysis, all cases of fungal keratitis between 2006 and 2016 were evaluated.

This study evaluates the spectrum of bacterial and mycotic pathogens of keratitis.

Two periods were observed separately in one decade (2006/07 and 2015/16). The germ spectrum in these two periods does not differ substantially. The most commonly isolated bacterial organisms were Staphylococci and Pseudomonas spp. Whereas fungal keratitis was mainly due to Candida spp. or Fusarium spp. Patients with Fusarium spp were all contact lens wearers.

For the majority of patients the usual first-line regimens with increased local antibiotic therapy with aminoglycosides and cephalosporins or fluoroquinolone monotherapy was sufficiently. Although fungal keratitis is rare, it should always be kept in mind as a possible cause of keratitis especially in patients on long-term steroid therapy or wearing contact lenses.

The Aging Retina in the Context of Cerebral Neurodegenerative Diseases

Neurodegenerative diseases (ND) consist of various affections of the central nervous system related to etiology, localization, and of course of the disease. Alzheimer’s disease (AD) and related dementias are best investigated together with socioeconomic conditions and play an important role in its high prevalence with no available treatment that cures the disease.

AD is the most important neurological ND disease with increasing prevalence. Age-related macular degeneration (AMD) and glaucoma are the most common retinal diseases with ND background and have an increasing prevalence. Irreversible loss of neurons, together with glial, microglial, extracellular, and vascular reactions are found both in the brain and retina and can show atrophic signs with onsets of plaques (AD), drusen (AMD) or optic degenerations. Alterations of cellular conditions result in irreversible functional impairments. Current therapeutic options preserve only residual function and preventive possibilities are actually missing. Molecular biomarkers have been identified to endorse a better understanding of ND and to provide new therapeutic options.

Within the physiological aging process, there are common features between the retina and the cortex. Also, pathological connections and phenotypes of certain age-related changes show unmistakable similarities. Improved understanding of pathogenetic mechanisms of cerebral and retinal diseases may help to establish preventive and therapeutic concepts in the future.

Source: Die alternde Retina im Kontext zerebraler neurodegenerativer Erkrankungen, Michael R. R. Böhm, Solon Thanos, Klin Monatsbl Augenheilkd 2019; 236(05): 682-690
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