Novel Ophthalmology 2021

NOVEMBER

09, 10 2021

PEERS ALLEY MEDIA

VIRTUAL EVENT

2nd Global OPHTHALMOLOGY AND EYE DISEASES SUMMIT

Theme:

Transforming Vision: Breakthroughs in Ophthalmology, New Drug Approvals, Milestones and Innovations

Peers Alley Media

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PEERS ALLEY MEDIA

YOUR FIRST CHOICE FOR RESEARCH INGENUITY

PROGRAM-AT-A-GLANCE

NOVEL OPHTHALMOLOGY 2021

DAY 1

TUESDAY, NOVEMBER 09, 2021

Scientific Program

BST – British Summer Time

Topics: **Glaucoma | Cataract | Ophthalmic Research | Ophthalmology Surgery | Pediatric Ophthalmology | Ophthalmology Disorders | Infectious Diseases | Eye Infections and Allergies | New Advancements and Protective Eye Care**

09:45-10:00	**Welcome & Meeting Introduction**
10:00-10:25	**Title: The use of the sodium glucose cotransporter-2 dapagliflozin in the treatment of advanced diabetic retinopathy** **Lakshini Y Herat,** The University of Western Australia, Australia
10:25-10:50	**Title: Anecdotal experiences of a family medicine expert as a hospitalist** **Sudarshan Srinivasa Gopalan,** Medall Healthcare, India
10:50-11:15	**Title: Amniotic membrane transplant in acute ocular surface burns in Western India: A tertiary eye care center study** **Dipali P Parmar,** M and J Institute of Ophthalmology, India
11:15-11:40	**Title: Chiasmal herniation following treatment of pituitary macroadenoma** **Marjolein Tabak,** Leiden University Medical Center, The Netherlands
11:40-12:05	**Title: Chronic headache and cerebral venous sinus thrombosis due to Varicella Zoster Virus infection: A case report and review of the literature.** **Laith Ishaq Alamlih,** Hamad General Hospital, Qatar
12:05-12:20	**Title: Synergistic protection of olfactory ensheathing cells and alpha-crystallin on RGCs survival through regulation of Akt/Bad pathway** **Yanhua Wang,** Taiyan Aier Eye Hospital, China
12:20-12:45	**Title: The effect of panretinal photocoagulation on retinal nerve fiber thickness and optic nerve head vessel density in patients with diabetic retinopathy** **Ozge Pinar Akarsu Acar,** Bakırköy Dr. Sadi Konuk Research And Training Hospital, Turkey
E-Posters & Lunch Break 12:45-13:00	
13:00-13:25	**Title: How to achieve disruptive innovation in the digital era?** **Borut Likar,** University of Primorska, Slovenia

13:25-13:50	**Title: Psychometric evaluation of Azeri version of the head and neck cancer specific quality of life questionnaire (EORTC QLQ-H&N43)** **Zoheir Mirzajani,** Tehran University of Medical Sciences, Iran
13:50-14:15	**Title: The unsuspected capacity of human body to dissociate the water molecule, like plants. Implications in Ophthalmology** **Arturo Solís Herrera,** Human Photosynthesis Research Centre, Mexico
14:15-14:40	**Title: Neuronal circuits related to emotion** **Okihide Hikosaka,** National Eye Institute, NIH, USA
14:40-15:05	**Title: Dual-acting therapeutic proteins for intraocular use** **Hanieh Khalili,** University of East London, UK
15:05-15:30	**Title: Supranational assessment of the quality of probiotics: Collaborative initiative between independent accredited testing laboratories** **Jean-Pol Warzée,** ESLP-European Scientific League for Probiotics, Belgium
E-Posters & Refreshment Break 15:30-16:00	
16:00-16:25	**Title: COVID 19 prevention on ophthalmology surgery** **Nancy Zhu,** Massachusetts General Hospital, USA
16:25-16:50	**Title: Essential guidelines for frontline health care staff safety for COVID-19** **Terrance L. Baker,** Johns Hopkins Medicine, USA **Jack V. Greiner,** Harvard Medical School, USA
16:50-17:15	**Title: Histopathological findings in retinas from donors with lethal COVID-19** **Vera L. Bonilha,** Cole Eye Institute, USA
17:15-17:40	**Title: Meta-analysis of CYP1B1 gene mutations in primary congenital glaucoma patients** **Amine HADDAD,** Hassan II University of Casablanca, Morocco
End of Day 1	

DAY 2

WEDNESDAY, NOVEMBER 10, 2021

Scientific Program

BST – British Summer Time

Topics: Glaucoma | Cataract | Ophthalmic Research | Ophthalmology Surgery | Pediatric Ophthalmology | Ophthalmology Disorders | Infectious Diseases | Eye Infections and Allergies | New Advancements and Protective Eye Care

09:00-09:25	**Title: The place of visual fields examination in the OCT era** **Nikol Panou,** General Oncologic Hospital Agioi Anargyroi, Greece
09:25-09:50	**Title: Application of bio-absorbable scaffolds for retinal degeneration therapeutics** **Sanaz Behtaj,** Griffith University, Australia
09:50-10:15	**Title: Dry-eye syndrome – Using a medicinal herbal agent for treatment** **LEUNG PING-CHUNG,** The Chinese University of Hong Kong, China
10:15-10:40	**Title: Multiscale 'whole-cell' models to study neural information processing – new insights from fly photoreceptor studies** **Zhuoyi Song,** Fudan University, China
10:40-11:05	**Title: The effect of occupation-based postural stability training on postural stability and occupational performance in visually impaired individuals: A randomised controlled trial** **Esma ÖZKAN,** University of Health Sciences Turkey, Turkey
11:05-11:30	**Title: Visio-spatial skills in athletes: Comparison of rugby players and non-athletes** **Lourens Millard,** Department of Human Movement Science, University of Zululand, South Africa
11:30-11:55	**Title: Efficacy of Omega-3 fatty acids and punctal plugs in the prevention of isotretinoin-associated ocular surface** **Tarek Roshdy Elhamaky,** Benha University, Egypt
11:55-12:20	**Title: Real world Evidence on the cost of illness of pneumonia in Dubai** **Sara Al Dallal,** Health Economics & Insurance Policies Department- DHIC, UAE
12:20-12:30	**Title: Frontalis suspension procedure with an upper retroauricular fascia graft** **Kazuki Ueno,** Graduate School of Wakayama Medical University, Japan

E-Posters & Lunch Break 12:30-13:00

13:00-13:25	**Title: Atypical neurological manifestations of COVID-19** **Ishita Gupta,** Rashid Hospital, Dubai, UAE
13:25-13:50	**Title: Airway obstruction due to mucus plug in patients with organophosphorus poisoning– atropine the culprit? A case series** **Sajjan Prashant Shivaraj,** Aarupadai Veedu Medical College, India
13:50-14:15	**Title: 3D printed lenses for ophthalmic application** **Arpana Parihar,** CSIR-Advanced Materials & Processes Research Institute (AMPRI), India
14:15-14:40	**Title: Prediction of selected biosynthetic pathways for the lipopolysaccharide components in Porphyromonas gingivalis** **Wieslaw Swietnicki,** Hirszfeld Institute of Immunology and Experimental Therapy of PAS, Poland

E-Posters & Refreshment Break 14:40-16:00

16:00-16:25	**Title: Levodopa effects on patients with neovascular age-related macular degeneration** **Anna. G. Figueroa,** The University of Arizona, USA
16:25-16:50	**Title: Novel mutation in the TGFBI gene in a Moroccan family with atypical corneal dystrophy: A case report** **Amina BERRAHO-HAMANI,** Hôpital des Spécialités, MOROCCO
16:50-17:15	**Title: Combination of apolipoprotein-A-I/apolipoprotein-A-I binding protein and anti-VEGF treatment overcomes anti-VEGF resistance in choroidal neovascularization in mice** **Yingbin Fu,** Baylor College of Medicine, USA
17:15-17:40	**Title: Evaluating the quality of glaucoma education for patients** **Haaris M. Khan,** University of British Columbia, Canada
17:40-18:05	**Title: Bite and Sight: Is there a correlation** **Patricia Valerio,** Federal University of Minas Gerais, Brazil

End of Day 2

Closing Remarks

BOOKMARK YOUR DATES

3RD GLOBAL OPHTHALMOLOGY AND EYE DISEASES SUMMIT

JULY 12-13, 2022 | PARIS, FRANCE

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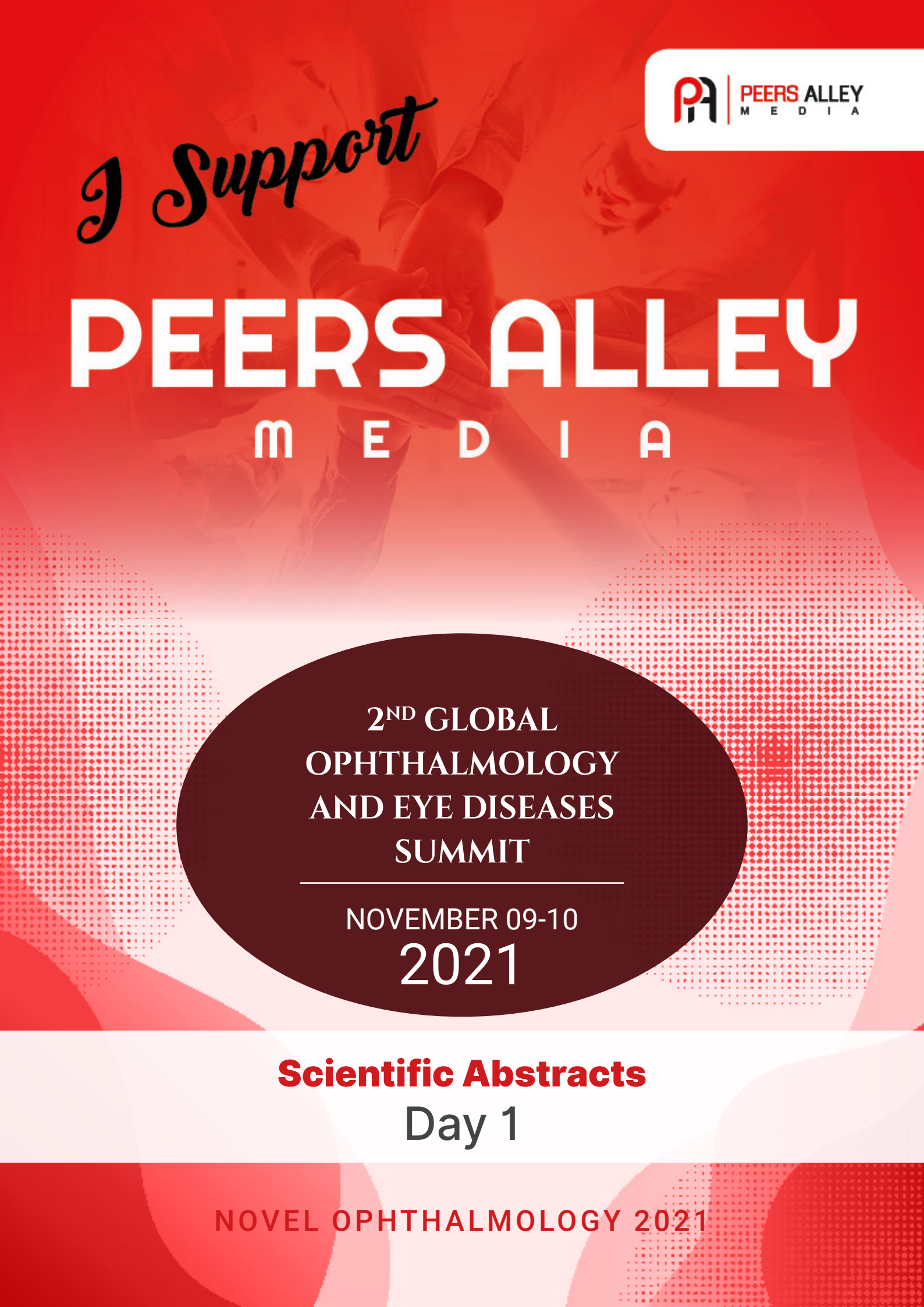

2ND GLOBAL OPHTHALMOLOGY AND EYE DISEASES SUMMIT

NOVEMBER 09-10
2021

Scientific Abstracts

Day 1

PEERS ALLEY MEDIA

Theme: Transforming Vision: Breakthroughs in Ophthalmology, New Drug Approvals, Milestones and Innovations

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NOVEMBER 09-10, 2021

The use of the Sodium Glucose Cotransporter-2 Dapagliflozin in the treatment of advanced diabetic retinopathy

Lakshini Y Herat[1], Aaron L Magno[2], Elizabeth P Rakoczy[3,4], Markus P Schlaich[5,6] and **Vance B Matthews[1]**

[1]Dobney Hypertension Centre, School of Biomedical Science - Royal Perth Hospital Unit, The University of Western Australia, Australia
[2]Research Centre, Royal Perth Hospital, Australia
[3]Lions Eye Institute, Nedlands, Australia
[4]Centre for Ophthalmology and Visual Science, The University of Western Australia, Australia
[5]Dobney Hypertension Centre, School of Medicine - Royal Perth Hospital Unit, The University of Western Australia, Australia
[6]Department of Cardiology and Department of Nephrology, Royal Perth Hospital, Australia

Background: Diabetic retinopathy (DR) is a recognized vision-threatening complication of diabetes mellitus and is one of the leading causes of end-stage blindness globally. Diabetic retinopathy is characterized by significant changes in the retinal vasculature and the neural structure. Presently, Sodium Glucose Cotransporter-2 (SGLT2) inhibitors are used in diabetic patients to improve their blood glucose levels in an insulin-independent manner. We have recently established that there is elevated levels of SGLT2, in the eyes of mice with DR. Given the broad therapeutic application of SGLT2 inhibitors, we hypothesize that SGLT2 inhibition may alleviate the development and progression of DR.

Aims: As SGLT2 inhibitors exert multiple beneficial effects in diabetic patients, we examined the effectiveness of the SGLT2 inhibitor, Dapagliflozin, in the treatment of DR using well-characterized DR mouse models.

Methods: Dapagliflozin was administered to mice with and without diabetes for 8 weeks via their drinking water at 25mg/kg/day. Urine glucose levels were measured weekly and their response to glucose was tested at week 7. After 8 weeks of treatment eyes and kidney tissue were harvested under terminal anesthesia. The retinal vasculature and neural structure was assessed using immunofluorescence and immunohistochemistry techniques.

Results: Dapagliflozin treated DR mice exhibited metabolic benefits suggested by healthy body weight gain and pronounced glucose tolerance. Our data indicate for the first time that Dapagliflozin reduced the development of retinal vascular lesions and the blockade of SGLT2 activity may potentially alleviate diabetic optic neuropathy. Furthermore, treatment with Dapagliflozin prevents diabetes induced renal hypertrophy.

Summary and conclusions: Our data demonstrate the exciting future potential of SGLT2 inhibitors as a therapeutic for DR.

Biography

Dr Herat completed her PhD in 2018 at the University of Western Australia and is an emerging early-career scientist working as a Research Fellow at the Translation Research Laboratory, Dobney Hypertension Centre in Perth, Western Australia (WA). She is investigating the mechanisms of Sodium Glucose Co-transporter 2 (SGLT2) inhibition in the context of diabetes, with a specific focus on eye, kidney and heart complications. Additionally, she is investigating the role of SGLT2 inhibition and regulation of the sympathetic nervous system in various aspect of hypertension, obesity and metabolic syndrome, cardiovascular and chronic kidney disease.

She has published in reputed journals such as JACC: Basic to Translational Science, Journal of Hypertension, World Journal of Gastroenterology, International Journal of Molecular Sciences, Biomedicines and International Journal of Endocrinology. She has authored 22 publications and have received >500 citations. In addition, she has successfully secured >$220,000 in research funding through competitive grant schemes.

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Anecdotal experiences of a family medicine expert as a hospitalist

Sudarshan Srinivasa Gopalan

Consultant Physician, Medall Healthcare, India

"Hospitalists", who are generalists, play a vital role in managing inpatients. They are qualified in family medicine and internal medicine. This is quite a popular culture in the US health system. The Indian healthcare system you know is already fragmented into specialists and super specialists, as many patients get referred to multiple places for an ailment or multiple ailments. The existing super-specialty system in the tertiary care centers will need moderation by generalists to reduce the cost of care and free up specialists to see more patients. This role of a generalist is filled by hospitalists. Family medicine specialists can assess admitted patients "as a whole" by applying the concept of "holistic and comprehensive approach". Family physicians are trained in managing basics of surgery, ophthalmology, otolaryngology, orthopaedics, Ob-Gyn, paediatrics and what not! They would play an important role in picking up the illnesses across such specialties and guide appropriately.

My journey as a hospitalist was quite enriching. I would like to share a few examples of how family medicine training helped me in managing patients for better outcomes. An elderly lady who was a diabetic was admitted with severe back pain, a diagnosis of spondylolisthesis was made based on X-ray findings and she was put on analgesics. When she started vomiting, I was called in to examine her. At the outset, I was not sure if the vomiting was due to the intractable pain. A detailed examination of other systems revealed suprapubic tenderness and renal angle tenderness. Urinalysis and USG KUB confirmed findings of pyelonephritis. She was started on antibiotics and underwent DJ stenting by the urologist and could walk back home after a couple of days. There was another time when I was comanaging a term, pregnant lady admitted with dengue fever. It was in the middle of the night and the patient's family were worried about the baby. They were anxious and asked me if the baby was alright. A doctor from another specialtywould probably want Ob-Gyn to answer such concerns. But being trained in family medicine, I did a brief examination and looked for the fetal heart rate with the help of a stethoscope, and it sounded good. So I reassured them. Minutes later, the Ob-Gyn registrar assessed the patient and confirmed that the baby was healthy by clinical exam and CTG was reassuring. An elderly man was admitted with sepsis secondary to urinary tract infection. He was shifted to the inpatient ward from ICU, after stabilization. When I asked him, his main concern was that he was not able to see through his right eye. This had been bothering him for 6 months. I

did a brief ophthalmic examination starting from visual acuity and found that he had the only perception of light in his right eye and he was able to localize the light source. Having learned the basics of ophthalmology in family medicine training, I was pretty sure that his optic nerve was intact as he was able to localize the light source and there was no RAPD. When I examined his eye, I could find a mature cataract in the right eye. A provisional impression was already made. I referred the patient to the ophthalmologist, who confirmed the cataract and performed its removal with intraocular lens implantation. His vision was restored. I could quote many more examples of how family medicine training made a difference in the lives of the patients by picking up the disease early and guiding appropriately.

Having hospitalists is a good way of minimizing resource expenditure in hospitals and a better way of managing inpatients. Both family medicine and internal medicine specialists would serve the purpose. There might be few differences in approach by family medicine trained and internal medicine trained hospitalists. The former would have spent more time in ambulatory medicine during their core training and the latter in inpatient medicine, intensive care and medicine allied super specialties. There are a few studies which concluded that the hospitalist model led to better outcomes in patient care and decreased the length of hospital stay than the nonhospital model while utilizing minimal hospital resources. The same concept of "hospitalist care" could be initiated in India in district and community hospitals. There might be concerns regarding family physicians switching over to hospitalist practice, thereby compromising community-based outpatient clinics. This could be tackled by introducing more hospital-based community outreach clinics; periodic rotations of hospitalists between hospitals and clinics. This would not only help in referring sicker patients from clinics to the attached hospitals but also would serve the purpose of "continuity of care" and "coordinated care" with the help of specialists.

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Amniotic membrane transplant in acute ocular surface burns in Western India: A tertiary eye care center study

Dipali P Parmar and **Pradnya K Bhole**

M and J Institute of Ophthalmology, India

Objective: To evaluate the outcomes of early amniotic membrane transplant (AMT) in acute ocular surface burns using Dua's classification.

Methods: This is retrospective analysis conducted at a tertiary eye care center in Western India. We included 27 eyes of 24 patients from May 2014 to May 2019 who underwent AMT within 2 weeks post insult along with medical treatment for acute ocular surface burns using Dua's classification for grading on presentation. Post operative assessment for ocular surface epithelization, corneal vascularization, symblepharon formation, and visual outcome at the time of complete epithelization was done.

Results: Eight, seven, three, and nine eyes with grade III, IV, V, and VI, respectively, were included in the study. The mean duration of the presentation was 5.5 ± 3.6 days, with the mean follow up of 4.83 ± 2.2 months. Alkali burn (62.96%, 17/27 eyes) was the commonest. The mean epithelization time was 5.80 ± 2.92 weeks. Corneal vascularization for >6 clock hours was seen in 52.38% (11/21 eyes with vascularization). Symblepharon was seen in 55.55% (15/27 eyes). Vision improvement and corneal vascularization to a lesser extent (<6 clock hours) was observed in Group A (grades III and IV) as compared to group B (grades V and VI) and found to be significant (P value = 0.031, P value = 0.007, respectively).

Conclusion: Amniotic membrane grafting is a useful aid in moderate grades of acute ocular surface burns with an important adjunct role in severe cases.

Biography

Dr. Dipali Parmar is an assistant professor in ophthalmology, BJ Medical College, Ahmedabad, Gujarat University, India (2008 -till date).

Consultant in cornea & ocular surface department at M & J Western Regional Institute of Ophthalmology, Ahmedabad, Gujarat University, India.

Active Member of All India Ophthalmological Society, Cornea Society of India, Delhi Ophthalmological Society, All Gujarat Ophthalmological Society, Oculoplastic Association of India.

Chief author/co-author of >75 presentations (research paper/e-poster/physical poster/video presentations/ophthalmic photography) at various state, national & international ophthalmic conferences/meetings.

Winner in ophthalmic photography competition at Keracon, cornea society of India, annual meeting 2016 & 2020.

Chief author & co-author of various award-winning case & paper/e-poster presentations at annual DOS international hybrid conference of Delhi Ophthalmological Society, 2020.

Chiasmal herniation following treatment of pituitary macroadenoma

M. Tabak, I.C. Pelsma, M.C. Kruit, W.R. van Furth, N.R. Biermasz and **I.C. Notting**

Leiden University Medical Center, The Netherlands

Purpose: To evaluate whether the occurrence of chiasmal herniation coincides with visual field (VF) deterioration and to compare the course of VF defects in patients with and without radiological chiasmal herniation following treatment of pituitary adenoma.

Methods: This retrospective cohort study included 48 pituitary macroadenoma patients with chiasm compression, divided into three groups: Group 1 (N=12), downward displaced optic chiasm and deteriorated VFs; Group 2 (N=16), downward displaced optic chiasm; Group 3 (N=20), control-group matched for tumour size and follow-up VFs. VFs in mean deviation (dB) were compared over time and a severity index, the Chiasm Herniation Scale (CHS), for herniation based on radiological parameters was designed.

Results: After treatment, all groups showed improvement of VFs (Gr1: 2.97 dB p=0.097, Gr2: 4.52 dB p=0.001 and Gr3: 5.16 dB p=0.000), followed by long-term gradual deterioration. The course of VFs between patients with and without herniation was not significantly different (p=0.143), neither was there a difference in the course before and after herniation (p=0.297). The median time till onset of herniation was 40 months (IQR 6 month-10 years) and did not significantly differ (p=0.172) between the groups. There was no relation between VFs and the degree of herniation (p=0.729).

Conclusion: Herniation does not appear to have clinical relevance with respect to VF outcome. The newly designed CHS is the first scoring system to quantify the severity of herniation and, in the absence of alternatives, may be useful to describe MRI findings to serve future added value in larger sized outcome studies.

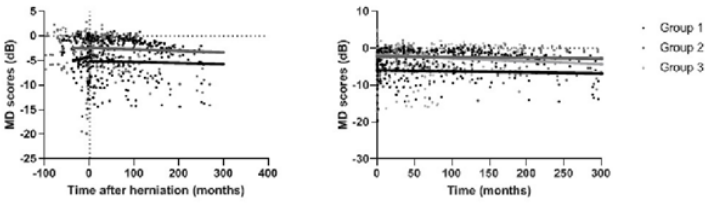

Fig.1 *Course of visual fields. On the left the course of the VF around the moment of herniation (time=0) for Group 1 and 2. On the right the long-term course of VF after treatment for Group 1, 2 and 3*

Biography

My name is Marjolein Tabak and I'm from the Netherlands. After achieving a master's degree in Medicine at VU Free University of Amsterdam, I started doing research at the Center for Pituitary Tumours in Leiden, resulting in the publication of my paper 'Chiasmal herniation following treatment of pituitary macroadenoma'. As of December 2020 I am an Ophthalmology resident at Leiden University Medical Center. Currently, besides the residency program, I am doing research into the long term results and predictive factors after pituitary adenoma treatment.

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Chronic headache and cerebral venous sinus thrombosis due to Varicella zoster virus infection: A case report and review of the literature

Laith Alamlih[1], Mohammad Abdulgayoom[2], Suresh N Menik Arachchige[2], Mohammed Hamza Shah[3] and **Muhammad Zahid[2,4]**

[1]Rheumatology Section, Department of Medicine, Hamad General Hospital, Qatar
[2]Department of Medicine, Hamad General Hospital, Qatar
[3]Department of Radiology, Hamad General Hospital, Qatar
[4]Weill-Cornell Medicine, Qatar

Varicella zoster virus (VZV) infection causes 2 clinically distinct forms of the disease: varicella (chickenpox) and herpes zoster (shingles). Primary VZV infection results in the diffuse vesicular rash of varicella, or chickenpox. Endogenous reactivation of latent VZV typically results in a localized skin infection known as herpes zoster, or shingles. The infection usually manifests as a self-limited disease. However, it can be associated with various neurologi-cal complications such as encephalitis, meningitis, ventriculitis, cerebellar ataxia, ischemic or hemorrhagic, and, rarely, cerebral venous sinus thrombosis (CVST). This report presents a case of cerebral venous sinus throm-bosis due to varicella zoster virus infection in a 20-year-old Nepalese man who presented to the Emergency Department with headache. Case Report: A 20-year-old Nepalese male patient presented to the Emergency Department with headache of 10 day's du-ration. Five days prior to that, he had a diffuse pruritic skin rash. Examination as well as serology confirmed the presence of primary varicella infection. Computed tomography (CT) and magnetic resonance venography (MRV) demonstrated CVST. Thrombophilia workup revealed a transient elevation of antiphospholipid serology. Shortly after admission, the patient had a transient seizure. He was treated with acyclovir, levetiracetam, and anticoagulation. A comprehensive literature review of similar cases was performed to establish a link between thrombotic complications and primary VZV infection and to formulate possible mechanistic pathways. Conclusions: This report shows that primary VSV infection can be associated with vasculopathy and CVST. Physicians should recognize this serious complication, which should be diagnosed and treated without delay.

Biography

Laith Alamlih is Associate Professor of rheumatology at Polytechnic university and a consultant rheumatologist at Alia hospital, Hebron, Palestine. Having graduated from Cairo university with honors, he completed the Internal medicine residency and fellowship training in Hamad medical corporation, Qatar. Dr. Alamlih has many publications in peer reviewed Journals in the field of internal medicine and rheumatology. He and his team were awarded with the best original research in Hamad medical corporation 2018. His major interest is in Antiphospholid, connective tissue diseases and Rheumatology MSK US.

Synergistic protection of olfactory ensheathing cells and alpha-crystallin on RGCs survival through regulation of Akt/ Bad pathway

Yanhua Wang

Taiyan Aier Eye Hospital, Aier Eye Hospital Group, China

Background: Our recent in vivo studies showed that olfactory ensheathing cells (OECs) and α-crystallin can promote retinal ganglion cells (RGCs) survival and axonal regeneration synergistically after optic nerve injury. However, the mechanism is still unknown.

Objectives: Here, we studied the synergistic effect and mechanism of OECs and α-crystallin on RGCs survival by H2O2-induced oxidative damage and optic nerve crushed injury of adult rat.

Methods: After H2O2-induced oxidative damage, RGC-5 cells were treated with OECs, α-crystallin and combination of OECs andα-crystallin. Apoptosis of RGC-5 was assessed by flow cytometry. Phosphorylated Akt and Bad, and the cleaved-caspase3 were detected by western blot after optic nerve injury in vivo and H2O2-induced RGC-5 oxidative damage in vitro.

Results: The results showed that OECs and α-crystallin all could inhibit RGC-5 apoptosis ($P<0.01$), increase the phosphorylation of both Akt and Bad, and decrease the activation of caspase-3 ($P<0.01$). However, the effect of the combination group was the most significant than other groups. Conclusion: These findings indicated that inhibiting RGCs superoxide damage through regulation of Akt/Bad pathway is one of the mechanisms of OECs andα-crystallin promoting the optic nerve recovery after injury.

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The effect of panretinal photocoagulation on retinal nerve fiber thickness and optic nerve head vessel density in patients with diabetic retinopathy

Ozge Pinar Akarsu Acar

Bakirkoy Dr Sadi Konuk Training and Research Hospital, Turkey

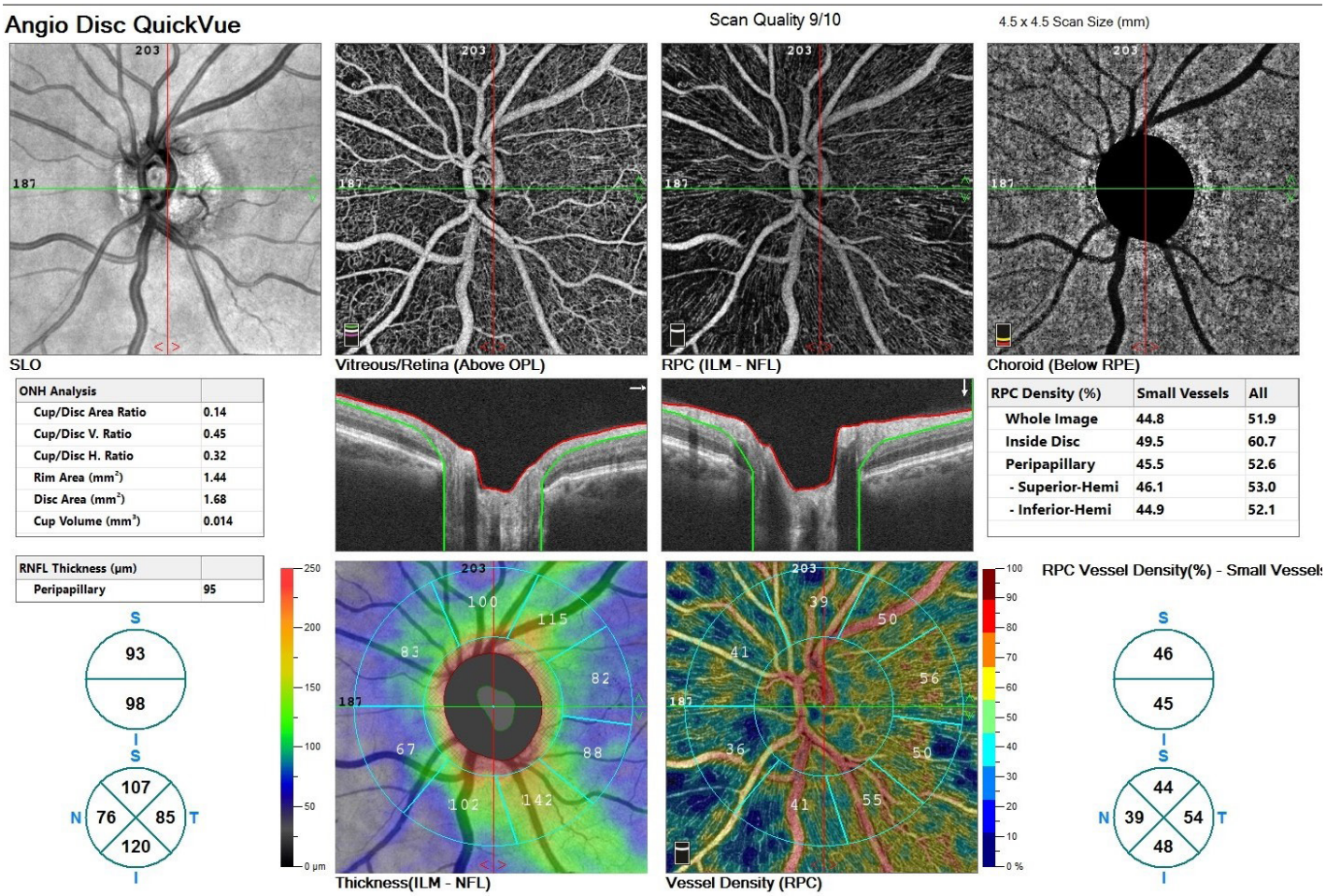
Aim: Evaluation of the pre-laser and post-laser peripapillary retinal nerve fiber thickness (RNFL) and radial peripapillary capillary (RPC) vascular density in patients who underwent panretinal laser photocoagulation (PRP) with the diagnosis of severe nonproliferative diabetic retinopathy (NPDR) or proliferative diabetic retinopathy (PDR) by using optical coherence tomography angiography (OCT-A).

Material-methods: Nineteen eyes of 19 patients who were followed up in our retina department and were diagnosed with severe NPDR or PDR by fundus fluorescein angiography (FFA) imaging, and then completed panretinal laser photocoagulation in 4 sessions with 532nm argon laser were included in this study. Both quantitative RPC vessel density values obtained from 4.5x4.5 mm optic nerve head examinations and RNFL values measured with RT XR Avanti AngioVue device before and 6 months after PRP were compared in all patients (Figure 1).

Results: Ten of the patients (52.6%) were male, 9 (47.4%) were female, and their mean age was 64.1 ± 7.7. Twelve (63.2%) of the laser applied eyes were right and 7 (36.8%) were left. 12 (63.2%) patients had severe NPDR and 7 (36.8%) had PDR. A statistically significant increase was observed in the temporal quadrant of RNFL in the 6th month after PRP ($p = 0.006$), while there was no significant difference in the superior, nasal and inferior RNFL quadrants ($p = 0.614$, $p = 0.351$, $p = 0.407$; respectively). There was no statistically significant difference between RPC vessel density values before and after PRP.

Conclusion: It was observed that there was an increase in RNFL temporal quadrant in the 6th month after PRP due to severe NPDR or PDR, but there was no significant difference in RPC vessel density values.

Figure 1: Optical coherence tomography angiography imaging of a patient 6 months after panretinal photocoagulation.


Angio Disc QuickVue
Scan Quality 9/10
4.5 x 4.5 Scan Size (mm)
SLO
Vitreous/Retina (Above OPL)
RPC (ILM - NFL)
Choroid (Below RPE)
ONH Analysis
Cup/Disc Area Ratio 0.14
Cup/Disc V. Ratio 0.45
Cup/Disc H. Ratio 0.32
Rim Area (mm²) 1.44
Disc Area (mm²) 1.68
Cup Volume (mm³) 0.014
RPC Density (%) Small Vessels All
Whole Image 44.8 51.9
Inside Disc 49.5 60.7
Peripapillary 45.5 52.6
- Superior-Hemi 46.1 53.0
- Inferior-Hemi 44.9 52.1
RNFL Thickness (µm)
Peripapillary 95
S 93 98 I
S 107 N 76 85 T 120 I
Thickness(ILM - NFL)
Vessel Density (RPC)
RPC Vessel Density(%) - Small Vessels
S 46 45 I
S 44 N 39 54 T 48 I

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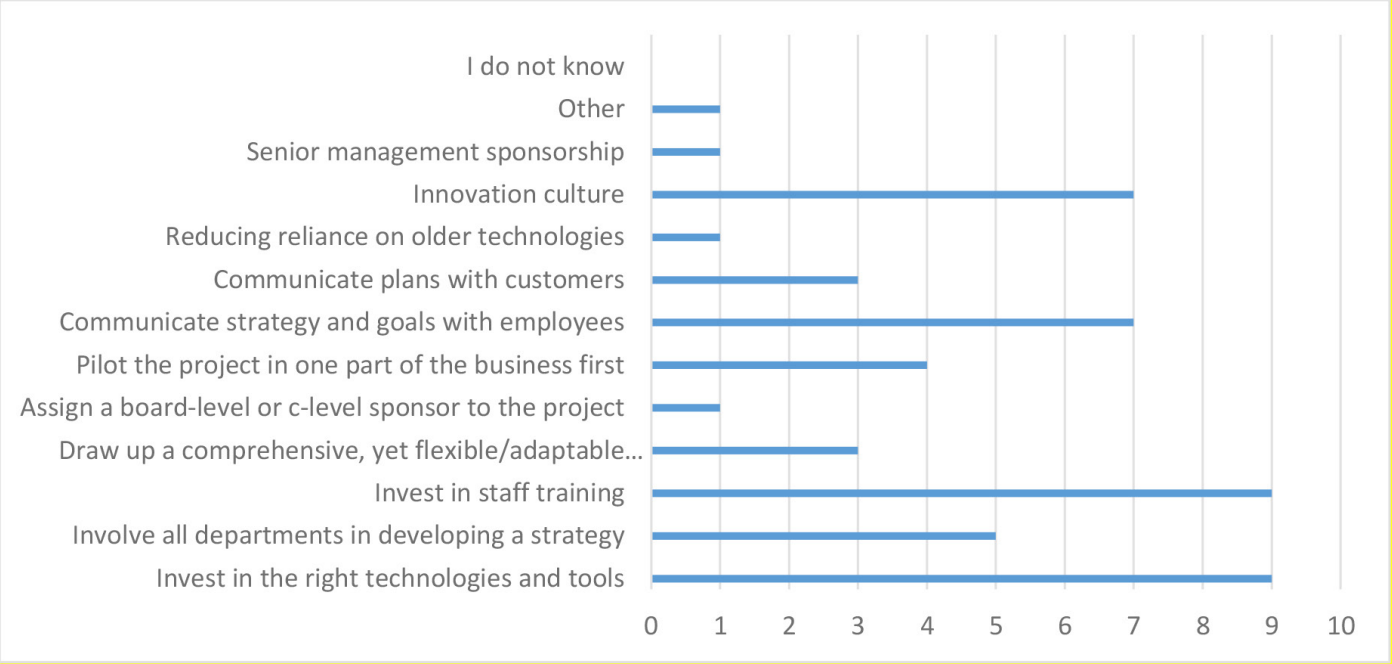
How to achieve disruptive innovation in the digital era?

B. Likar[1], Vasja Roblek[2], Maja Meško[3] and **Franci Pušavec[4]**

[1]Faculty of Management, University of Primorska, Slovenia
[2]Faculty of Organisation Studies, Novo Mesto, Slovenia
[3]Faculty of Management and University of Maribor, Faculty of Organisational Sciences, University of Primorska, Slovenia
[3]Faculty of Mechanical Engineering, University of Ljubljana, Slovenia

Even though the word innovation is one of the mantras in all spheres of business and society, I believe innovation is much more. It should be a mind-set, which defines all our activities. The spectrum of innovation covers incremental improvements in daily activities on one side, and addresses breakthrough innovations on the other. Innovations are related to innovative products, often based on science discoveries, innovative business models, services and important organisational changes. Especially in the era of digital transformation, we are all faced with challenges, how to create and implement such novelties, how to maximise the impact of digital opportunities. Based on our research, we will demonstrate how disruptive innovations affect organisational changes and determine critical factors in organisations. Technological changes, the emergence of innovative products, business models and solutions and organisational culture will be addressed as one of the crucial key success factors. It is also important to be aware of the enablers of the successful introduction of disruptive innovations (pls. see the picture), wherein internal and external factors should be properly managed. In addition, we must be aware of obstacles and the approaches necessary to mitigate them. As P. Drucker argues, innovation is a serious work and can and should be managed in the same way as any other business function. At the same time, he notes that innovation is the work of knowing rather than doing. On the personal level, it includes the personality traits of the individual, such as curiosity, perseverance, courage, and determination, and of course creativity. On the organisational level, one of the first steps is to define the right strategy and set clear goals. It should be supported with concrete activities, appropriate measures, and checking progress at every step. All the mentioned reflects in the fact, that innovation is one of most complex business processes.



Picture: The most important steps to enable the successful introduction of disruptive innovations

Biography

Borut Likar is a full professor, a research counsellor and President of Academic Assembly at the University of Primorska. Likar is also a member of research lab at University of Ljubljana, Faculty of Mechanical Engineering. His work encompasses management of creativity, R&D, technology, and innovation processes in the field of educational system and industry. He is an innovator, initiator and the head of several successful R&D – national and sound EU projects as well as the author of 12 patents, countless models and copyright works, which many proved to be extremely marketable. In total app. 700 bibliographic units. He is a recipient of many international awards for his innovations and R&D achievements. Among numerous lectures he has given, the talks at the United Nations' headquarters in Geneva and at the European Parliament in Brussels were met with a particularly wide response..

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Psychometric evaluation of Azeri version of the head and neck cancer specific quality of life questionnaire (EORTC QLQ-H&N43)

Zoheir Mirzajani[1,2], Mahammad M. Davudov[1,2], Chingiz Rahimov[2], Iraj Harirchi[1], Namig Amiraliyev[3], Kanan Amiraliyev[2], Narmin Rustamova[2], Jayran Zebardast[1] and **Ali Montazeri[4,5]**

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[4]Population Health Research Group, Health Metrics Research Center, Iranian Institute for Health Sciences Research, Iran
[5]Faculty of Humanity Sciences, University of Science and Culture, Iran

Background: Oral cancer surgery can have a deep effect on the quality of life in the patient both in terms of functional and psychological aspects. This study aimed to translate and validate the European Organization for Research and Treatment of Cancer head and neck cancer specific quality of life questionnaire (EORTC QLQ-H&N43) in Azerbaijan.

Methods: Forward-backward translation was applied in order to translate the EORTC QLQ-H&N43 from English into Azeri. Then, a sample of patients with oral cancer attending a teaching hospital affiliated to Azerbaijan Medical University completed the EORTC QLQ-C30 (the core cancer specific questionnaire), and the EORTC QLQ-H&N43. To evaluate psychometric properties of the QLQ-H&N43, known groups validity, convergent and divergent validity was performed. Internal consistency reliability was examined by estimating the Crornbach's alpha coefficient.

Results: Ninety-six patients with confirmed diagnosis of oral cancer were entered into the study. The mean age of patients was 59.6 (SD = 10.7) years and 36 patients (37.5%) diagnosed as having stage IV and 10 patients (10.5%) were metastatic. The results obtained from comparing quality of life scores among these patients showed that the questionnaire was able to differentiate among patients who differed in stage and metastasis lending support to its validity. In addition convergent and divergent validity showed satisfactory results. The internal consistency of the multi-item scales as assessed by the Cronbach's alpha coefficient showed acceptable results (alpha ranging from 0.66 to 0.78).

Conclusion: The findings suggest that in general the Azeri version of EORTC QLQ-H&N43 has satisfactory internal consistency reliability and validity, but additional psychometric evaluation is needed to draw firm conclusions.

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The unsuspected capacity of human body to dissociate the water molecule, like plants. Implications in ophthalmology

Arturo Solís Herrera and **Paola Eugenia Solís Arias**

Human Photosynthesis® Research Centre, México

The three main causes of blindness, worldwide, are age-related macular degeneration, diabetic retinopathy, and glaucoma, since first half of past century. Their prevalence and incidence they have not been able to be modified, despite impressive technological and pharmacological advances, and despite the efforts of researchers, clinicians, and patients.

The available therapies, despite how expensive, painful, or complicated, have not been able to modify the main causes of blindness in the world. However, an unexpected finding is changing things: the human body's unsuspected ability to dissociate the molecule from water, like plants.

It is a disruptive discovery, because it breaks into a thousand pieces the sacrosanct double role of glucose as the universal precursor of any organic molecule, both in plants and animals, and at the same time, erroneously considered as the source of energy par excellence of the Eukaryotic cell.

The fact that our body could transform light energy into chemical energy through the dissociation of water, represents a before and after in biology and especially in medicine. It is shocking that our body directly takes energy from light, like plants; and with that energy it drives the chemical processes that constitute what we call life. Glucose is an extraordinary molecule that our body uses as a precursor to 99% of the organic molecules that make us up, but glucose is not able to provide the energy that its own metabolism requires. No way.

The energy that our body requires comes from the dissociation of the water molecule, and not from glucose. And it is very likely that this is the explanation for the failure of current therapies to approach the main causes of blindness.

Neuronal circuits related to emotion

Okihide Hikosaka

Chief, Section of Neuronal Networks, National Eye Institute, National Institutes of Health, USA

Choosing good objects and actions is critical for survival. We have found that different parts of the basal ganglia contribute to such object/action choices, but differently. The anterior part focuses on predicted outcomes (using short-term memories), whereas the posterior part focuses on historical outcomes (using long-term memories). These areas, thus, generate different opinions, which is very important for appropriate as well as creative decisions. Relevant mechanisms may be present in the whole brain.

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Dual-acting therapeutic proteins for intraocular use

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[2]School of Pharmacy, University College London, UK
[3]National Institute for Health Research (NIHR) Biomedical Research Centre at Moorfields Eye Hospital NHS, Foundation Trust and UCL Institute of Ophthalmology, UK

Antibody-based medicines that target vascular endothelial growth factor (VEGF) are administered by intravitreal injection (IVI) to treat chronic neovascular retinal diseases. Given that current anti-VEGF biologics require long-term monthly or bimonthly injections, there is also a need to reduce the frequency of IVIs to treat chronic intra-ocular conditions. There has been near-exponential growth of IVIs since 2007, but the need for repeated intravitreal administration is difficult for patients, and compliance often decreases after the first year of treatment. Minimising the cumulative number of IVIs is also important because of the potential for harmful effects to ocular tissues. Chronic ocular hypertension has been associated with repeated intravitreal anti-VEGF injections. Much ongoing effort is focussed on enhancing therapeutic outcome of these medicines. One strategy is the use of dual-acting drugs (e.g., bispecific antibodies) to simultaneously bind to more than one intraocular biological target. A dual-acting molecule targeting components within the vitreal cavity, where one function is to display increased affinity to tissue in the posterior cavity to slow clearance from the vitreous (affinity targeting) and the other function would be to bind to a therapeutic target. To augment therapies to inhibit neovascularisation, other possible clinical targets have emerged, including neutralising platelet-derived growth factor-B (PDGF-B), angiopoietin-2 (ANG-2), tissue factor (TF) and integrin. Intraocular inflammation also contributes to the pathologies of neovascularisation and uveitis. Although targets to treat inflammation have begun to emerge, most investigations have been conducted by administering the antibodies parenterally rather than by IVI because intravitreal formulations have not yet been developed.

Biography

I have obtained my PhD in development and formulation of biotherapeutics from UCL School of Pharmacy and postdoctoral in using biotherapeutics for ocular uveitis and neovascularisation at UCL Institute of Ophthalmology. I am currently a senior lecturer in pharmaceutics at University of East London. My research interests lie in the area of monoclonal antibody developments, in general, and with therapeutic applications, in particular. I am currently leading a research group focused on the development and formulation of the novel antibody-based mimetics for chronic diseases, such as ocular neovascularisation and uveitis, looking into ways of improving the sustained release profile with enhanced stability and extended duration of action. This translational research is crucial in developing next-generation biotherapeutics with great potential in the improvement of human health and well-being.

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Supranational assessment of the quality of probiotics: Collaborative initiative between independent accredited testing laboratories

Jean-Pol Warzée[1], Marina Elli[2], Abdoulaye Fall[3], Daniela Cattivelli[2] and **Jean-Yves François[4]**

[1]ESLP-European Scientific League for Probiotics, Belgium
[2]AAT-Advanced Analytical Technologies Srl, Italy
[3]Genalyse Partner, A Food Chain ID Company, Belgium
[4]Quality Partner, A Food Chain ID Company, Belgium

Recent acquisitions about the role of the microbiota in the functioning of the human body make it possible to envisage an increasing use of beneficial microbes, and more particularly of probiotics as well as their metabolites, as nutritional supplements. National and EU authorities are engaged in assuring the safety and quality of food supplements and in defining rules to assess and communicate their efficacy on human health. The quality of probiotics, intended as strains' identification, viability, and stability over time, is a crucial factor of credibility with consumers and health professionals. Analytical technologies for the quality control of probiotics must also be adapted to new preparations, such as those including new multi-strains complex combinations. Accredited laboratories face this relevant challenge on a daily basis. Through its close collaboration with the laboratory commissioned to produce the specifications for its ESLP quality label (identification and quantitative analyses) together with its scientific committee, the ESLP has been focusing on this issue for 10 years. Recently, as part of the internationalization of the ESLP quality label, a new and unique initiative in Europe for the evaluation of the quality of probiotic preparations has been carried out. The collaboration between two accredited laboratories in Belgium and in Italy represented a concrete example of supranational collaboration in the assessment of the quality of probiotic preparations. Results show that both laboratories are in line as expected in terms of performance. Common approaches to the qualitative assessment of probiotic preparations, especially for complex and composite recipes, in terms of number of strains and included substances, should be encouraged and promoted all over the EU.

Biography

With more than 20 years' experience in the microbiota and Microbiotics in human health, Jean-Pol Warzée, Medical Doctor, has participated to many research and development projects in this area in collaboration with European Research Centers and Universities. Co-Founder 10 years ago of the ESLP - European Scientific League for Probiotics for 2012, Jean-Pol is also the nominated President of the ESLP. Member of several international scientific associations, he has been vice-president of the PRI - Pharmabiotics Research Institute from 2015 – 2017. Jean-Pol participates regularly to international congresses as speaker related to "Probiotics Quality Control" and also "Microbiotics in human health".

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COVID 19 prevention on ophthalmology surgery

Nancy Zhu[1], Andrew Emery[1] and Jingping Wang[2]

[1]Department of Oral and Maxillofacial Surgery, Massachusetts General Hospital, USA
[2]Department of Anesthesia, Critical Care and Pain Medicine, Massachusetts General Hospital, USA

Coronavirus Disease 2019 (COVID-19) has caused suffering and death around the world. Careful selection of facial protection is paramount for preventing virus spread among healthcare workers and preserving mask and N95 respirator supplies. This study is a comprehensive review of literature written in English and available on Pubmed comparing the risk of viral respiratory infections when wearing masks and N95 respirators. Current guidelines for mask and N95 respirator use, patient COVID-19 disease status, aerosol producing procedures were also collected and incorporated into a workflow for selecting appropriate facial protection during the current pandemic. Most studies suggest N95 respirators and masks are equally protective against respiratory viruses. Some evidence favors N95 respirators, which are preferred for high-risk procedures when aerosol production is likely or when the COVID-19 status of a patient is positive or unknown. N95 respirators may also be used for multiple patients or reused depending on the type of procedure and condition of the respirator after each patient encounter. N95 respirators are preferred over masks against viral respiratory pathogens on Ophthalmology Surgery, especially when a patient's COVID-19 status is positive or unknown.

Biography

Nancy Zhu is an Oral and Maxillofacial Surgery resident at the Massachusetts General Hospital. She received her DMD degree from Harvard School of Dental Medicine and BA from Pomona College. Her research interests are primarily in global health, health equity and craniofacial malformations and reconstruction.

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Essential guidelines for frontline health care staff safety for COVID-19

Terrance L. Baker[1] and **Jack V. Greiner**[2]

[1]*Deaprtment of Medicine, Johns Hopkins Medicine, USA*
[2]*Department of Ophthalmology, Harvard Medical School, USA*

Safety guidelines for physicians, nurses, and allied healthcare and facility staff that may be exposed to patients infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in a healthcare facility. SARS-CoV-2 infection is highly contagious and places healthcare workers at risk for infection resulting in coronavirus disease (COVID-19). Physicians, nurses, and allied healthcare and facility staff in all front-line environments must be provided and utilize necessary personal protective equipment (PPE). Ophthalmologists and their staff must adopt a universal set of guidelines in which to conduct themselves in order to minimize infection with the SARS-CoV-2 contagion. The establishment of these guidelines remains necessary in this viral pandemic since such directives can create a standard of safety that is universally accepted. These guidelines establish a framework to provide consistency among eye care facilities and staff from the time the staff member arrives at the eye care facility until they return home. These guidelines provide a practical description of the minimum necessary protection for ophthalmologist, consulting physicians, nurses, and allied healthcare and facility staff against SARS-CoV-2.

Biography

Dr. Baker received his BS and MS degrees from Johns Hopkins University and MD degree at George Washington University School of Medicine. Dr. Baker completed residency training at Medical College of Virginia. He is Board Certified in Family Practice, Emergency Medicine, Geriatric Medicine and Forensic Medicine. He is a Certified Medical Director by the American Medical Directors Association. He currently serves on the Board of Directors for national organizations including American Association of Physician Specialist and North America Association for Light Therapy. He serves as a forensic medical expert. He is a Clinical Instructor at the University of Maryland. He has lectured extensively on use of phototherapy treatment. Dr. Baker currently practices at the Sollay Medical Center in Baltimore and Katani Hospital in Kenya. Dr Baker is also Executive Producer and Host of the award winning TV show "Doctors In The House" featured on New African Broadcasting Network.

Jack Greiner, MS, OD, DO, PhD is a practicing physician and surgeon, clinical ophthalmologist and research scientist who holds 3 doctoral degrees and has over 40 years of clinical, research and academic experience. He has authored over 200 publications in the areas of medical basic science and clinical science research, presented over 300 papers at national and international scientific meetings and holds 5 US patents. Dr. Greiner's has extensive experience in conducting hundreds of FDA clinical trials and as principal investigator on over 170 clinical trials. Dr. Greiner is an Associate Professor of Ophthalmology at Harvard Medical School, Adjunct Associate Clinical Professor of Ophthalmology at Tufts University School of Medicine, Associate Scientist at the Schepens Eye Research Institute of Massachusetts Eye & Ear Infirmary, and Director of Clinical Eye Research of Boston and Charles River Eye Associates of Boston and Winchester, Massachusetts.

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Histopathological findings in retinas from donors with lethal COVID-19

Vera L. Bonilha[1,3], Vijay K. Jidigam[1], Rupesh Singh[1], Julia C. Batoki[1], Caroline Milliner[1], Onkar B. Sawant[2] and **Sujata Rao[1,3]**

[1]Cole Eye Institute, USA
[2]Center for Vision and Eye Banking Research, Eversight, USA
[3]Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, USA

Objectives: To determine histopathological retinal changes associated with lethal SARS-CoV-2 infection.

Methods: Eyes from seven COVID-19 positive and six similar age-matched control donors with a negative test for SARS-CoV-2 were assessed. Fixed globes were evaluated ex-vivo with macroscopic, confocal scanning laser ophthalmoscopy (SLO) and optical coherence tomography (OCT) imaging. Macula and peripheral regions were processed for epon-embedding and immunocytochemistry with antibodies.

Results: Fundus analysis shows hemorrhagic spots and increased vitreous debris in several of the COVID-19 eyes compared to the controls. OCT based measurements indicated an increased trend in retinal thickness in the COVID-19 eyes, however the difference was not statistically significant. Immunostaining of retinas with SARS-CoV-2 S protein antibody reacted with round cells within the retina of all the COVID-19 eyes close to the optic nerve head but not in the control retinas. Histology of the retina showed presence of hemorrhages and central cystoid degeneration in several of the donors. Whole mount analysis of the retina labeled with markers showed changes in retinal microvasculature, increased inflammation, and gliosis in the COVID-19 eyes compared to the controls. The choroidal vasculature displayed localized changes in density and signs of increased inflammation in the COVID-19 samples.

Conclusions: In situ analysis of the retinal tissue suggests that there are severe subclinical abnormalities that could be detected in the COVID-19 eyes. This study provides a rationale for evaluating the ocular physiology of patients that have recovered from COVID-19 infections to further understand the long-term effects caused by this virus.

Biography

The research projects in my laboratory aim to decipher the molecular mechanisms at work in age-related macular degeneration (AMD), a disease with known genetic and environmental etiological risk factors. Specifically, we investigate the antioxidant mechanisms regulated by DJ-1 utilizing animal and cellular models. My lab also has focused on the examination of postmortem eye tissues obtained from individuals in whom the disease-causing gene has been identified offers a unique opportunity to study the relationship between genotype and disease pathogenesis and the effects of the genetic defect on retinal structures. Finally, we have started to characterize the histopathological retinal changes associated with lethal SARS-CoV-2 infection. We are continuing these studies to determine whether enduring biological changes are detected in the post-COVID-19 retina and whether these changes remain localized within the central retina, as determined by our preliminary studies of globes of donors that died from COVID-19 infections.

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Meta-analysis of *CYP1B1* gene mutations in primary congenital glaucoma patients

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Glaucoma affects more than 70 million people worldwide, which making it the second leading cause of blindness in the world.1 The rare and severe form of glaucoma called, Primary congenital glaucoma (PCG), is usually transmitted as an autosomal-recessive disease with an incomplete penetrance and about 10% to 40% of its cases are familial.2,3.

The importance of this presentation is to highlight the interest of the genetic study of CYP1B1 mutations, its impact on the development of the eye and the genesis of PCG. This information could help clinicians to identify the population at high risk, to screen for genetic tests and to act early in a way to improve the patient prognosis.

An in-depth study was carried out by the following search engines: PubMed, Scopus, clinic key and direct science for articles that have been published from 2011 until 2020.

We have identified 81 articles in this review

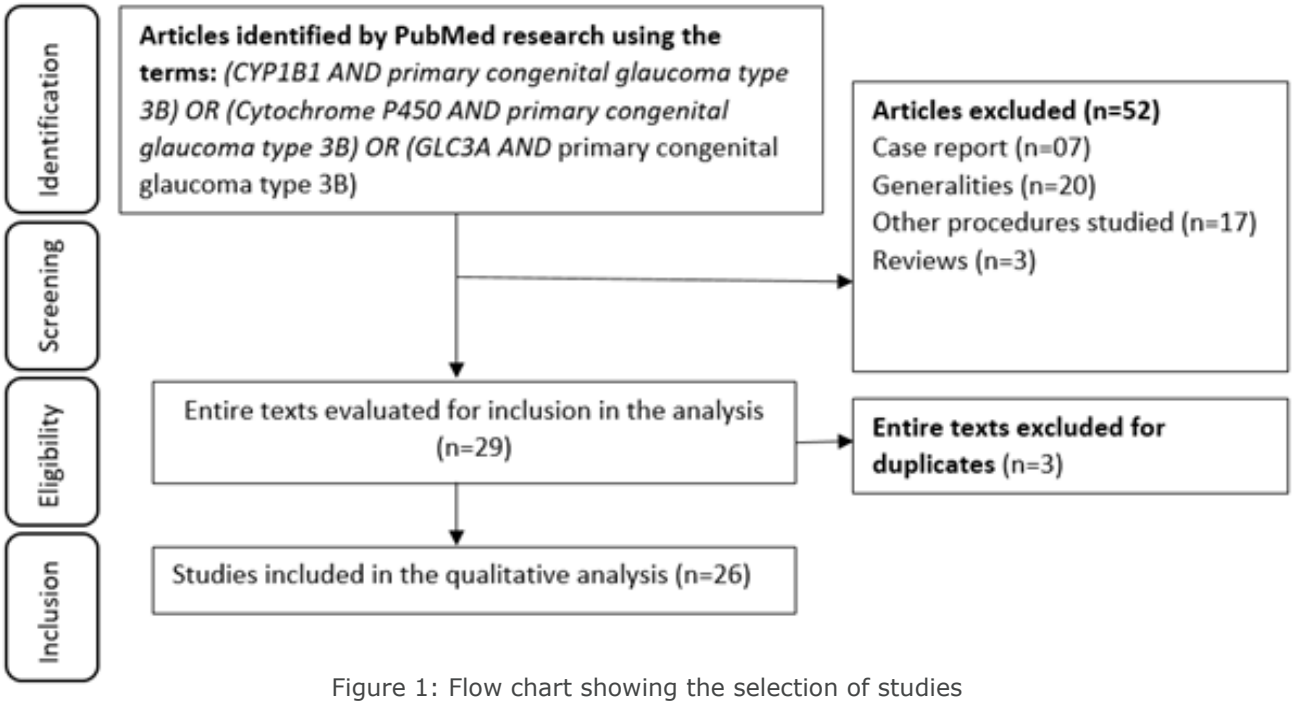

Figure 1: Flow chart showing the selection of studies

from 2011 to 2020, excluding 3 duplicates. 78 titles and abstracts were filtered from which 52 studies were not considered since they did not match the inclusion criteria as mentioned above. 26 complete studies were examined.

It is Important to highlight that the majority of the included studies were from ASIA (64,3%), followed by Europe (17, 85%), America (10, 71%) and Africa (7,14%).

The hereditary form by autosomal recessive trait with high penetrance is now confirmed for PCG transmission.37 In this study, the proportion of CYP1B1 gene alterations differences in populations around the world, where Asia dominates with a rate of 26. 92 % followed by the Middle East with 21. 15%. Considering the precedent analysis, our study encompasses a higher number, for a better understanding of the association of these mutations with PCG. Therefore, it can be useful to develop reliable genetic tests to be a routine examination for patients with a family history of PCG.

Biography

My name is Amine HADDAD, I am in the 4th year of my specialty in ophthalmology in Morocco and I am currently doing an internship in Paris. I have always been fascinated by the genetics of ophthalmological diseases, which is why I chose the genetics of glaucoma as the subject of my Phd. I am also a member in several learned societies in ophthalmology.

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Day 2

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The place of visual fields examination in the OCT era

Nikol Panou

General Oncologic Hospital "Agioi Anargyroi", Greece

Objectives: To show the contemporary value of Visual Fields in illustrating vision loss and revealing the diagnosis. An interesting case presentation and more tricky cases from my office archives solved with the help of Visual Fields examination will be presented.

Scope: To remind that Visual Fields have typical scotomas not only in Glaucoma, but in various ophthalmic and systemic diseases. In the era of accelerating modern imaging progress there is place for this traditional ophthalmic examination method that sometimes represents a unique way to illustrate the description of the patient's visual disturbance, and can guide us to the correct diagnosis.

Results: A case reporting sudden painless central vision loss was diagnosed by Visual Field examination and Fundoscopic examination. A central visual field scotoma due to an optic disk pit was revealed.

Methods: Visual Fields examination made visible the complaint of the patient and together with dilated fundus examination provided the diagnosis. Neuroophthalmologic, systemic, and laboratory evaluation were normal. In this case OCT and fluorescein angiography were not that helpful as they demonstrated minor defects and no serous retinal detachment.

Conclusion: Visual Fields is an undated, traditional, low cost examination which does have a role in the everyday practice as a diagnostic tool in patients reporting visual disturbances. They may even be irreplaceable in some patients, in spite of the explosion of technologic achievements in ophthalmic diagnostic equipment.

Biography

Dr. Nikol Panou-Alumna of Arsakeio: the oldest private female school in Greece. Completion of Medical Studies, Specialization in Ophthalmology, Ph.D. and Post Ph.D. Research in the University of Athens, Greece. Fellow of the European Board of Ophthalmology (FEBO). International Fellow Harvard, MEEI. Consultant at the General Oncologic Hospital of Kifisia "Oi Agioi Anargyroi", Greece since 2013.

Application of bio-absorbable scaffolds for retinal degeneration therapeutics

S. Behtaj

Clem Jones Centre for Neurobiology and Stem Cell Research, Griffith University, Australia

Glaucoma, the second leading cause of blindness worldwide, is identified by increasing degeneration of retinal ganglion cells (RGCs). The stem cell-based RGC replacement therapy, as a promising treatment for glaucoma, could be facilitated by an application of artificial tissue-engineered scaffolds to provide a supportive structure for RGCs. An appropriate selection of materials that are able to support RGCs is a fundamental consideration in fabrication of these scaffolds.

This talk is focusing on a study to investigate a mean to differentiate human embryonic stem cell derived retinal progenitor cell (hESC-RPCs) into RGCs and an approach for hESC-RPC-to-RGC differentiation on the poly(ε-caprolactone) (PCL)/poly (glycerol sebacate) (PGS) scaffolds.

The results revealed that PCL/PGS scaffolds promoted the differentiation of hESC-RPCs into RGCs and supported the orientated elongation of RGCs' neurites, validating the PGS/PCL scaffold as a supportive vehicle for RGC proliferation and cultivation for treatments of glaucoma.

Biography

I am a Postdoctoral Research Fellow in the Clem Jones Centre for Neurobiology and Stem Cell Research (CJCNSCR) at Menzies Health Institute Queensland. I currently have 12 years of experience as a researcher in the field of science and am highly interested in tissue Engineering and regenerative medicine. During my PhD program, I am involved in academic research related to the degenerative diseases.

I have taught different university courses since 2008. During my teaching, I have achieved the status of Associate Fellow of The Higher Education Academy based on UK Professional Standards Framework for teaching and learning support in education.

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Dry-eye Syndrome – Using a medicinal herbal agent for treatment

PC Leung

Institute of Chinese Medicine, The Chinese University of Hong Kong, China

Introduction: Dry-eye syndrome is a common eye disease, not only prevalent among the aging population but affecting more and more young people who habitually rely on cell phone information. The standard treatment in ophthalmology clinics is the use of artificial tears which remain a short acting superficial remedy.

Aim: To develop a topical agent which supports tear production through stimulating effects on the conjunctival glands: from lachrymal to goblet cells.

The Medicinal Herb: Dendrobium is a medicinal herbs used in Traditional Chinese Medicine for the treatment of gastro-intestinal ailments like gastric or intestinal colic. The assumption is that Dendrobium stimulates the exocrine glands of the gastrointestinal tract to maintain a physiological harmony.

The exocrine stimulatory effects have been proven in the laboratory to be more general: applicable to other exocrine glands in the eyes and oral cavity. The biological effects include anti-inflammatory and secretion promotion.

Research Protocol

I. Selection of the favorable species of Dendrobium for laboratory and clinical studies

II. Laboratory explorations to confirm the anti-inflammatory and secretary stimulation aquaporin effects

III. Clinical study using a steaming device

Research Outcome: A novel topical agent to alleviate harmful effects of Dry Eye Syndrome.

Biography

Professor LEUNG Ping Chung, OBE, JP, Hon DSSc, DSC, MBBS, MS, FRACS, FRCS(Edin), FHKCOS, FHKAM(Orth); is Emeritus Professor of Orthopaedics & Traumatology, Faculty of Medicine; Director of Centre for Clinical Trials on Chinese Medicine, Institute of Chinese Medicine; Director, State Key Laboratory of Research on Bioactivities and Clinical Applications of Medicinal Plants (The Chinese University of Hong Kong). He wrote over 800 scientific manuscripts in journals and 27 books. Professor Leung has been appointed as editor of 11 International Journals since 1982.

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Multiscale 'whole-cell' models to study neural information processing – new insights from fly photoreceptor studies

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[3]School of Computing, Engineering and Physical Sciences, University of Central Lancashire, UK

[4]Department of Biomedical Science, University of Sheffield, UK

[5]State Key Laboratory of Cognitive Neuroscience and Learning, Beijing Normal University, China

Dynamical "whole-cell" models are computational models that aim to account for the integrated function of numerous genes or molecules to behave like virtual cells in silico. For neural signaling processes, such models should not only implement the molecular mechanisms at the microscopic level but also reproduce the macroscopic signal processing dynamics at the cellular level. However, because of the limited knowledge available for the biochemical signaling pathways inside neurons, few "whole-cell" neuron models exist to date. Here, I will talk about a "whole-cell" model for a fly photoreceptor, the first "whole-cell" model for a neuron. By simulations, the model revealed several completely novel mechanisms underlying neural information processing in fly photoreceptors. Specifically, in this talk, I will briefly introduce several conclusions that are in contrary to traditional beliefs: 1) how signal refractory period and stochasticity are beneficial, rather than detrimental to neural information processing; 2) how photomechanical movements combat motion blur, rather than causing it. These results gained from studying the model was believed to have changed our understanding of phototransduction in insect vision, illustrating the usefulness of using dynamical "whole-cell" models to study neural information processing.

Biography

Dr. Zhuoyi Song is currently a research fellow (tenure-track) at the Institute of science and technology for brain-inspired intelligence (ISTBI). Dr. Song obtained her Ph.D. in 2011, majored in automatic control at the University of Sheffield, UK. Then, she conducted research at UCL and the University of Sheffield before joining ISTBI in 2019. Dr. Song's research interests reside in multi-scale computational modeling of neural systems, and the study of adaptive neural encoding mechanisms. She published her results in high-impact journals, such as Current Biology, eLife, Journal of Neuroscience, etc.

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The effect of occupation-based postural stability training on postural stability and occupational performance in visually impaired individuals: A randomised controlled trial

E. Ozkan[1] and **E. Akı**[2]

[1]*Department of Occupational Therapy, University of Health Sciences Turkey, Turkey*

[2]*Department of Occupational Therapy, Hacettepe University, Turkey*

Introduction: The purpose of this research was to examine the effect of occupation-based postural stability training on occupational performance and postural stability in visually impaired individuals.

Method: The research was designed as pre-test/post-test, with two groups (study group and control group). A total of 34 individuals with visual impairment were randomly assigned to the two groups. Participants were evaluated using a sociodemographic information form, the Biodex Balance System for postural stability, the Canadian Occupational Performance Measurement for assessing performance and satisfaction of occupations and the semi-structured interview form. The control group received only postural stability training with the Biodex Balance System and the study group received individualized occupation-based postural stability training with the Biodex Balance System BBS during a 12-week intervention (24 sessions).

Results: A statistically significant difference was found between the postural stability values of the study group and the control group when looking at pre and post-training measurements ($p < 0.05$). It was observed that there was an improvement in the postural stability of the participants in both groups. There was a statistically significant increase in the occupational performance and satisfaction of participants in the study group ($p < 0.01$).

Conclusion: Adding person-centered, meaningful and purposeful occupations into rehabilitation programs that use technological devices increases functionality in activities of daily living.

Biography

Esma Özkan graduated from Başkent University Physiotherapy and Rehabilitation Department in 2010. In 2013 she completed her master's degree in Hacettepe University Health Sciences Institute Occupational Therapy Program. In 2018, she completed her doctorate in Hacettepe University Health Sciences Institute Occupational Therapy Program. She works as an assistant professor in the Department of Occupational Therapy at the University of Health Sciences. Areas of interest: visual rehabilitation, pediatric rehabilitation and cognitive rehabilitation.

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Visio-spatial skills in athletes: Comparison of rugby players and non-athletes

Lourens Millard, Ina Shaw, Gerrit Jan Breukelman and **Brandon S. Shaw**

Department of Human Movement Science, University of Zululand, South Africa

Background: Research pertaining to the superiority of athletes' visio-spatial expertise when compared to non-athletes is conflicting. This discrepancy may arise due to a superiority in athletes in only specific visio-spatial skills (VSS) and not all aspects of vision.

Aims: The aim of this study was to discern whether rugby players have superior VSS/ expertise in comparison to non-athletes, when comparing six visual skills (accommodation facility, saccadic eye movement, speed of recognition, peripheral awareness, visual memory and hand-eye coordination).

Methods: The participants underwent an optometric assessment, after which the VSS components of non-athletes and premier league rugby players were assessed by using six different existing tests namely; the Hart Near Far Rock, saccadic eye movement, evasion, accumulator, flash memory and ball wall toss tests.

Results: A statistically significant ($p \leq .05$) difference existed between rugby players and nonathletes for five out of the six tests. Conversely, no real evidence is shown that visual memory differs between rugby players and non- athletes ($p = .599$).

Conclusion: This study found that rugby players have an enhanced accommodation facility, saccadic eye movements, speed of recognition, peripheral awareness and hand-eye coordination, but not visual memory, when compared to non-athletes. These findings of a superiority of rugby players in specific VSS have broad implications for theories of sport vision, how best to select tests and in the development of sport-specific VSS testing batteries.

Biography

I am a 29-year-old hard-working, sport loving individual. Incredibly knowledgeable about anything sport related, this is why I studied sport science. Very well educated, having already received three degrees including a Masters degree in Human movement science. I have recently completed my PhD in Sport Science and I am waiting to graduate in July 2021. Multiple Publications have been achieved in accredited journals world-wide (Please see research gate profile). My research focuses on perceptual motor development, and how vision in sport can be used to aid in high performance. I have created a visio-spatial intelligence testing battery specifically for rugby players, and I am in the process of testing its efficacy.

Efficacy of Omega-3 fatty acids and punctal plugs in the prevention of isotretinoin-associated ocular surface disease

Tarek Roshdy Elhamaky[1,2]

[1]*Benha faculty of medicine, Egypt*

[2]*Ibn Nafees medical center, UAE*

Background: The most common side effect associated with isotretinoin therapy is meibomian gland dysfunction and evaporative dry eye disease. Dietary supplementation with O3FAs has been recommended as effective therapy in MGD.

Purpose: To investigate the effects of omega-3 fatty acids and punctal plugs on ocular surface parameters in patients receiving systemic isotretinoin therapy.

Methods: This is a prospective randomized study that included 180 eyes of 90 patients who had systemic isotretinoin therapy (120–150mg/kg for at least 4–6months).

Exclusion criteria: DED according to the diagnostic criteria of TFOS DEWS II.

Patients were assigned into three groups; (1) O3FAs/PPs group: A soft preloaded silicone plug was inserted and received oral O3FAs two capsules twice daily total daily dose of 1040mg/day for 6months. (2) PPs group: A soft preloaded silicone plug was inserted and received oral placebo. (3) Isotretinoin group: No intervention was done.

At baseline, 1week, 1, 3, and 6months of study, Ocular surface evaluation tests were done in following order: OSDI, tear osmolarity, Schirmer's I test, TBUT, ocular surface staining score, and meibomian gland expression.

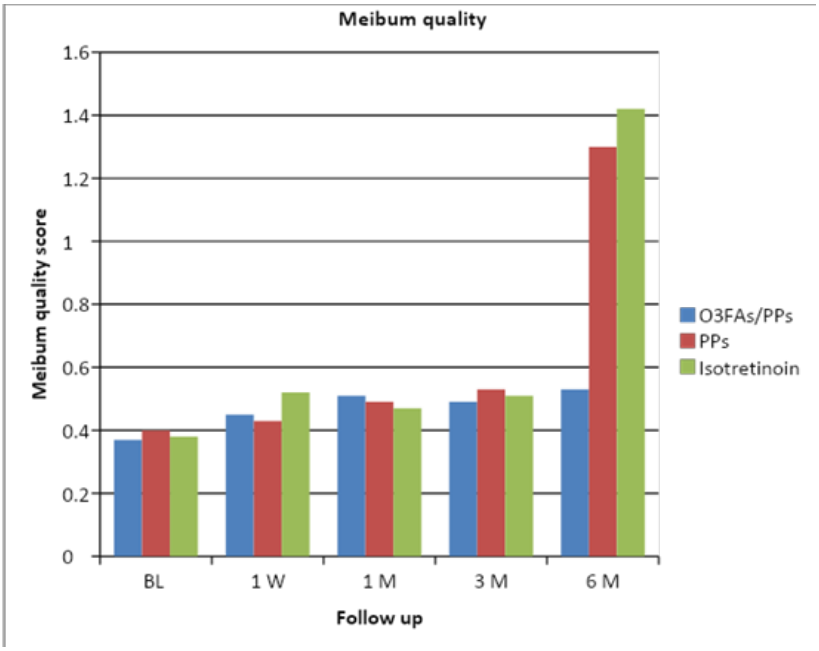
Results: The ocular surface parameters were better for the PPs and O3FAs/PPs groups than the isotretinoin group.

The isotretinoin group showed worsening of ocular surface parameters. There was no significant difference in ST1 throughout the whole study in all groups.

At 6 months follow-up, there were no statistically significant differences between PPs and O3FAs/PPs groups except meibomian expression score which showed a significant increase in PPs group.

Conclusion: Our cohort highlights the beneficial effects of the combination of O3FAs supplementation with PPs in the prevention of isotretinoin-associated OSD in this sample study.

Variable (mean and SD)	O3FAs /PPs group		PPs group		Isotretinoin group	
	BL	6MO	BL	6MO	BL	6MO
ST I (mm/5minutes)	14.1±1.7	13.6±2.0	13.5±2.4	13.1±1.9	13.6±2.8	12.3±2.1
FTBUT (seconds)	11.6±2.6	12.5±3.3	12.3±3.6	12.1±3.0	11.9±2.7	5.3±2.4*
OSDI score	6.8±3.5	7.2±3.6	7.3±3.3	7.5±2.7	7.1±3.2	30.1±8.6*
Ocular staining score: • 0 • 1 • 2 • 3	0.43±0.49 56.7% 43.3% 0.0% 0.0%	0.53±0.50 46.7% 53.3% 0.0% 0.0%	0.41±0.49 58.3% 41.7% 0.0% 0.0%	0.58±0.56 35% 61.7% 3.3% 0.0%	0.45±0.51 55% 45% 0.0% 0.0%	1.55± 0.87* 8.3% 36.7% 46.7 8.3%
Osmolarity (mOsm/L)	299.4±3.2	301.2±5.0	300.4±6.0	309.8±5.1	300.8±7.0	316.3±10*
Meibum Quality score: • 0 • 1 • 2 • 3	0.37±0.49 63.3% 36.7% 0.0% 0.0%	0.53±0.62 53.4% 40% 6.7% 0.0%	0.4±0.49 60% 40% 0.0% 0.0%	1.3±0.98* 25% 35% 23.3% 16.7%	0.38±0.48 61.7% 38.3% 0.0% 0.0%	1.42±0.1.01* 23.3% 26.6% 35% 15%



Biography

Dr. Tarek Roshdy Elhamaky is a Consultant Ophthalmologist and an associate Professor of ophthalmology, Benha University in Egypt. He holds M.D. degree in Ophthalmology 2008. He authored ophthalmic publications and serves as an editorial board member and a reviewer for several international ophthalmology journals.

He is an Oculoplastic surgeon and a member of European society of ophthalmic plastic and reconstructive surgery, specializing in cosmetic eyelid surgery (blepharoplasty), reconstructive eyelid surgery (eyelid deformities, tumors and trauma) and lacrimal surgery.

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Real world evidence on the cost of illness of pneumonia in Dubai

Sara Al Dallal

Senior Health Service Specialist, Health Insurance Policy Development Section
Health Economics & Insurance Policies Department- DHIC, UAE

Background: Pneumonia is a significant cause of morbidity and mortality among adults globally. This retrospective cohort analysis assessed the pneumonia burden and related healthcare resource utilization and costs in the at-risk (low, medium, and high-risk) adult patients in Dubai, United Arab Emirates (UAE).

Methods: The claims data from January 1, 2014 to June 30, 2019 were extracted from the Dubai Real-World Claims Database for patients, aged ≥18 year, having at least 1 pneumonia claim. Data for the inpatient, outpatient and emergency visits were assessed for 12-months, before (pre-index) and after (follow-up) a pneumonia episode. Healthcare costs were calculated based on dollar value of 2020.

Results: Total 48,562 records of eligible patients were analyzed (mean age = 39.9 years; low [62.1%], medium [36.2%] and high [1.7%] risk cohorts). Mean all-cause healthcare costs were approximately >45% higher in the follow-up period (1,947 USD/patient) versus pre-index period (1,327 USD/patient). During follow-up period, the mean annual pneumonia incidence rate was 1.3 episodes, with a similar pattern across all cohorts. Overall, mean claims and costs (USD) per patient (all-cause) were highest in the high-risk cohort in the follow-up period (claims: overall, 11.6; high-risk, 22.0; medium-risk, 13.9; low-risk, 9.9; costs: high-risk, 14,184; medium-risk, 2,240; low-risk, 1,388). Similarly, the mean pneumonia-related costs (USD) per patient were highest for the high-risk cohort (overall: 1,305; high-risk, 10,207; medium-risk, 1,283; low-risk, 882), however, the claims were similar across cohorts (claims/patient: overall: 2.0; high-risk, 1.9; medium-risk, 2.2; low-risk, 1.9). Most all-cause and pneumonia-related costs were due to inpatient visits (4,901 and 4,818 USD respectively), while outpatient (1,232 and 166 USD respectively) and emergency visits (347 and 206 USD respectively) contributed significantly lesser.

Conclusions: Pneumonia imposes a significant healthcare burden in the UAE, especially in the high-risk patients with severe comorbidities. These findings would guide clinicians and policy makers to make informed decisions.

Frontalis suspension procedure with an upper retroauricular fascia graft

Kazuki Ueno, Yuji Shirakawa, Satsuki Tachibana, Yoshitaka Wada and **Shinichi Asamura**

Department of Plastic and Reconstructive Surgery, Graduate School of Wakayama Medical University, Japan

Aim: Congenital ptosis and involutional blepharoptosis with poor levator function is commonly repaired with a frontalis suspension procedure. Numerous grafts using various materials have been developed for frontalis suspension procedure even though each of these have their own advantages and disadvantages. Here,we present the cases with ptosis treated with " the upper part of the retroauricular fascia (URF)",which is a new autologous graft for the frontalis suspension procedure.

Methods: Patients with congenital/involutional ptosis underwent frontalis suspension surgery with URF and followed-up for a year.

Results: The upper eyelids had symmetrically appropriate heights postoperatively. No postoperative lagophthalmos, eyelash inversion, tarsal deformity or ptosis recurrence occurred. Scars along the edge of the hairline were not noticeable and there were no hypertrophic scars.

Conclusion: A URF graft may be a useful alternative for frontalis suspension surgery since it can be harvested with easy access without any conspicuous scar.

Biography

Academic position

2017 - Assistant Professor,Department of Plastic and Reconstructive Surgery, Graduate School of Wakayama Medical University

Education

2005-2011 Wakayama Medical University,Wakayama,Japan Degree: M.D.

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Atypical neurological manifestations of COVID-19

Ishita Gupta[1], Mithun Reddy[2], Mir Mehdi Hussain[3], Pooja Murthy[4] and **Chris Robert[5]**

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[2,3,4]Vydehi Institute of Medical Sciences, India
[5]Larkin Community Hospital, USA

Objectives: Our review aims to identify the various neurological manifestations in SARS-CoV-2 positive patients, which could be an added advantage in the early diagnosis and prevention of further complications of the nervous system.

Scope: With the pandemic continuing to unfold, research is the need of the hour. Even with massive numbers of publications, gaps remain in the understanding of the natural history of the disease. This systematic review of the current literature on COVID-19 provides insight into some of the atypical manifestations of the disease.

Methodology: We conducted a systematic search during March and April of 2020 for research articles on the neurological manifestations of COVID-19. Three primary databases were used: PubMed, Google Scholar, and the WHO. The search strategy used the keywords coronavirus, COVID-19, neurological signs and symptoms, and CNS manifestations and was comprehensive with cross-checking reference lists from the articles retrieved. Articles that did not contain patient data or studies pertaining to SARS-CoV-1 and MERS were excluded. In doing so, we had 20 articles for the final review. Each paper was reviewed by two reviewers independently, and disagreements were discussed among all reviewers and resolved via a consensus. We tabulated the data using Microsoft Excel. Statistical analysis was not required, as this is a traditional review. Referencing was done according to guidelines and with EndNote. This study did not require ethical approval as data was obtained from already available databases, and patients were not directly involved.

Results: The study reports 1,034 COVID-19 positive patients with 468 males (45.26%) and 566 females (54.74%). The age range of the patients was six weeks to 74 years, with a median age of 44 years - almost all patients presented with neurological and non-neurological symptoms. The most common non-neurological symptoms were fever (48.6%) and coughing (57.37%). Other non-neurological symptoms were diarrhea, anorexia, myalgia, sore throat, dyspnea, chest pain, fatigue, headache, arthralgia, nausea, and vomiting. Both central nervous system (CNS) and peripheral nervous

system (PNS) symptoms were analyzed, and it was found that a higher number of patients had peripheral symptoms. Headache was seen in 307 patients and dizziness in 64 patients; impaired consciousness and altered mental states were seen in 18 patients.

Conclusion: Our results show that there is a wide range of symptoms that a COVID-19 patient can present with. Hence, physicians must suspect COVID-19 in those presenting with neurological symptoms as well.

Biography

Dr. Ishita Gupta is a graduate of Dr. Rajendra Prasad Government Medical College, India. After serving as a front-liner during the peak of the COVID-19 pandemic, Dr. Gupta currently works in Dubai Health Authority, UAE. She has over 20 publications including journal articles, conference presentations and posters.

Airway obstruction due to mucus plug in patients with organophosphorus poisoning– Atropine the culprit? A case series

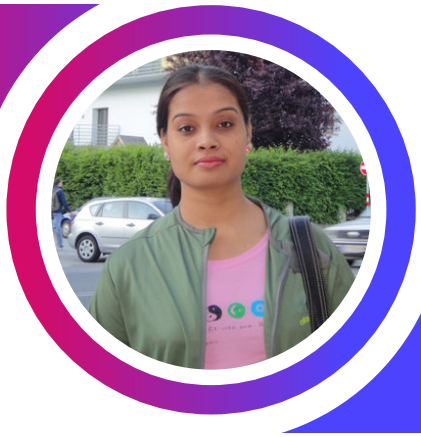
Sajjan Prashant Shivaraj and **Kulkarni Vandana Sharashchandra**

Aarupadai Veedu Medical College, India

Organophosphorus poisoning is a common cause of death in developing countries. These compounds inhibit acetylcholinesterase leading to accumulation of acetylcholine, causing overstimulation of nicotinic and muscarinic receptors. Atropine and oximes are the mainstay of treatment. Atropine helps in countering muscarinic effects and decreasing secretions. It also makes the secretions thick, tenacious and may obstruct the airway. We observed five cases of organophosphorus poisoning being treated with atropine developing sudden respiratory distress attributed to mucus plug obstructing the airway which was confused with intermediate syndrome. After removal of the mucus plug these patients recovered uneventfully.

Biography

Sajjan Prashant Shivaraj, MBBS, DA, DNB(Anaesthesiology), IDCCM, 44 years, currently working as Professor in the Department of Anesthesiology at Aarupadai Veedu Medical College, Pondicherry, India. Has worked for more than 15 years in the field of Anaesthesiology and Critical care in many places in India and in the Republic of Maldives. Apart from interest in critical care medicine is also interested in teaching and research in the field of anaesthesiology, critical care and palliative medicine.



3D printed lenses for ophthalmic application

Arpana Parihar and **Raju Khan**
Microfluidics & MEMS Center
CSIR-Advanced Materials & Processes Research Institute (AMPRI), India

Objectives: The aim of present talk is to discuss the current state of art technology available in the field of additive manufacturing-based 3D printing of lenses for ophthalmic application.

Scope: Additive manufacturing-based 3D printing of lenses opens many new possibilities related with fabrication of 3D printed lenses for various eye related issues. The fabrication of personalized smart lenses utilizing additive manufacturing have potential to fulfill market need.

Discussion: One of the most extensively used wearable devices is contact lenses that can be used for vision correction and cosmetic purposes as well. Smart contact lenses are currently being developed to monitor a variety of health issues, including dry eye illness, intraocular eye pressure, and checking of blood glucose levels. The contact lens has the advantage of interacting directly with the tears, which offer a wealth of information about ocular problems and blood biomarkers and hence can be exploited for sensing various disease. The use of nanostructures on the surface of contact lenses as optical transducers is possible; however, the integration of nanopatterns into the contact lens is difficult. The contact lenses are made utilizing a transparent resin and the DLP based 3D printing process. The printing parameters were tweaked to obtain acceptable levels of transmittance while maintaining suitable mechanical qualities for the lenses. The 3D printed technology' can produce contact lenses with diverse geometrical elements and requisite properties. Furthermore, colored contact lenses with appropriate transmittance qualities can be produced for aesthetic purpose. Additionally, using direct laser interference patterning, nanopatterns were embossed on the surface of the contact lenses (DLIP). Microstructural, mechanical, physical, and optical metrics can be used to characterize the samples for ophthalmic purpose.

Conclusion: 3D printed contact lenses provide a number of advantages over traditional contact lenses, including the ability to create personalized ophthalmic devices with the capability to interact with fluid and hence can be used as optical sensors for diagnostic purposes.

Biography

Dr. Arpana Parihar is currently working as a Women Scientist B at CSIR-Advanced Materials and Processes Research Institute (AMPRI), Bhopal, MP, India, under the scheme of DST-WoS-B awarded from Department of Science and Technology, Government of India. She did her PhD from Raja Rammana Centre for Advanced Technology, Indore. Her doctoral research work involves evaluation of tumor selectivity and photodynamic therapy (PDT) efficacy of chlorin p6 through receptor mediated targeted delivery in Oral cancer. After PhD, her postdoctoral research work at the Centre for Biomedical Engineering (CBME), Indian Institute of Technology (IIT) Delhi involves the enhancement of osteoinductive and osteoconductive properties of various implants made up of metals, ceramics, and polymers. Dr. Parihar is awarded with prestigious GATE, CSIR-NET, DST-WoS A and WoS B fellowship. She has more than 7 years of research and teaching experience at various prestigious institutes which fetched several peer reviewed papers in national and international journals of repute. Her current research activity includes 3D printing, fabrication of biosensors for early diagnosis of cancer, molecular docking and simulation for drug designing, tissue engineering, targeted cancer therapy, and 3D cell culture.

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Prediction of selected biosynthetic pathways for the lipopolysaccharide components in *Porphyromonas gingivalis*

Wieslaw Swietnicki[1] and **Ron Caspi**[2]

[1]*Department of Immunology of Infectious Diseases, L. Hirszfeld Institute of Immunology and Experimental Therapy of PAS, Poland*

[2]*Artificial Intelligence Center, SRI International, USA*

Porphyromonas gingivalis is an oral human pathogen. The bacterium destroys dental tissue and is a serious health problem worldwide. Experimental data and bioinformatic analysis revealed that the pathogen produces 3 types of lipopolysaccharide (LPS): normal (O-type), anionic (A-type), and capsular (K-type). The enzymes involved in the production of all three types of lipopolysaccharide have been largely identified for the first two and partially for the 3rd type. In the current work, we use bioinformatics tools to predict biosynthetic pathways for the production of the normal (O-type) lipopolysaccharide in the W50 strain *Porphyromonas gingivalis* and compare the pathway with putative other pathways in fully sequenced and completed genomes of other pathogenic strains. Selected enzymes from the pathway have been modeled and putative structures are presented. The pathway for the A-type antigen could not be predicted at this time due to two mutually exclusive structures proposed in the literature. Pathway for the K-type antigen biosynthesis could not be predicted either due to the lack of structural data for the antigen. However, pathways for the synthesis of lipid A, its core components, and the O-type antigen ligase reaction have been proposed based on a combination of experimental data and bioinformatic analyses. The predicted pathways are compared with known pathways in other systems and discussed. It is the first report in the literature showing in detail predicted pathways for the synthesis of selected LPS components for the model W50 strain of *P. gingivalis*

Biography

Dr. Swietnicki is a scientist working on antibacterial strategies. The work is focused on novel vaccines and therapeutics targeting bacterial virulence systems.

Dr. Swietnicki obtained his Ph.D. in Biochemistry and Molecular Biology from the University of Florida, Gainesville, FL, USA, in 1995 for his work on Hepatitis A Virus 3C protease. Later he worked on human prion proteins at CWRU, Cleveland, OH, USA before starting work on Select Agents at USAMRIID, Ft. Detrick, MD, USA, and ECBC, APG, MD, USA. In 2011 he moved to Poland to work on virulence blockers of enteropathogenic E. coli at EIT+ and later on novel vaccines against periodontitis at the Institute of Immunology and Experimental Therapy of PAS in Wroclaw, PL.

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Levodopa effects on patients with neovascular age-related macular degeneration

Anna. G. Figueroa[1], Brennan. M. Boyd[2], Cory. A. Christensen[3], Cameron G. Javid[4], Brian S. McKay[1], Timothy C. Fagan[2,5], Saira Purewal[2] and **Robert W. Snyder[5,6]**

[1]Department of Ophthalmology and Vision Science, The University of Arizona, USA
[2]College of Medicine, The University of Arizona, USA
[3]College of Public Health, The University of Arizona, USA
[4]Retina Associates, USA
[5]Snyder Biomedical Corporation, USA
[6]Department of Biomedical Engineering, The University of Arizona, USA

Background: Age-related macular degeneration (AMD) is a common cause of blindness worldwide. The cause of AMD is unknown, but dysfunction of the retinal pigment epithelium (RPE) in support of the retina is a central component of the disease. Neovascular AMD (nAMD) occurs in just 10-15% of total AMD cases, but accounts for about 90% of vision loss. Neovascular AMD is defined by retinal angiogenesis, caused by excessive levels of vascular endothelial growth factor (VEGF) secreted from the RPE. The current treatment is to inhibit VEGF activity with frequent intravitreal injections of anti-VEGF agents. We discovered a RPE G-protein coupled receptor (GPR143) that reduces secretion of VEGF, and its agonist is L-DOPA. In a prospective study in patients with newly diagnosed nAMD and naïve to anti-VEGF injections, we showed that L-DOPA was safe, well tolerated, and improved visual outcomes while delaying anti-VEGF injection therapy. Here we report whether continued L-DOPA supplementation in patients with nAMD is safe and well tolerated while decreasing the frequency of anti-VEGF injections and improving visual outcomes.

Methods: Following one month of treatment with L-DOPA alone, patients were returned to their retina specialist to receive anti-VEGF injections, as deemed medically necessary. To further evaluate the safety, tolerability, and efficacy of L-DOPA, patients subsequently received escalating doses of L-DOPA, 1 tablet TID the second month and then 2 tablets TID from the next month on. Patients were evaluated monthly for changes to best corrected visual acuity (BCVA), central retinal thickness (CRT) and retinal fluid. In addition, we evaluated the necessity of continued anti-VEGF injections.

Results: The positive results observed the first month of the study were sustained through 12 months of L-DOPA treatment with adjunct anti-VEGF injection (mean monthly injections of 0.38/month). When compared to baseline, we observed a 4.9 BCVA letter increase (p=0.04,

n= 16), a 23.1% decrease in retinal fluid (P=0.09, n=16) and CRT remained stable.

Conclusions: Our results suggest that L-DOPA supplementation has significant positive effects on nAMD, most likely through GPR143, the receptor in the RPE that controls VEGF secretion. L-DOPA significantly improved BCVA, reduced retinal fluid accumulation, and decreased the number of anti-VEGF injections necessary to control the disease. These results support the pharmacological targeting of GPR143 with agonists, such as L-DOPA to treat nAMD and supports further studies to modulate this receptor in AMD.

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Novel mutation in the *TGFBI* gene in a Moroccan family with atypical corneal dystrophy: A case report

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Hôpital des Spécialités, Morocco

Introduction: Corneal dystrophies (CDs) are a heterogeneous group of bilateral, genetically determined, noninflammatory bilateral corneal diseases that are usually limited to the cornea. CD is characterized by a large variability in the age of onset, evolution and visual impact and the accumulation of insoluble deposits at different depths in the cornea. Clinical symptoms revealed bilateral multiple superficial, epithelial, and stromal anterior granular opacities in different stages of severity among three patients of this family. A total of 99 genes are involved in CDs. The aim of this study was to identify pathogenic variants causing atypical corneal dystrophy in a large Moroccan family and to describe the clinical phenotype with severely different stages of evolution.

Case presentation: In this study, we report a large Moroccan family with CD. Whole-exome sequencing (WES) was performed in the three affected members who shared a phenotype of corneal dystrophy in different stages of severity. Variant validation and familial segregation were performed by Sanger sequencing in affected sisters and mothers and in two unaffected brothers. Whole-exome sequencing showed a novel heterozygous mutation (c.1772C > A; p.Ser591Tyr) in the TGFBI gene. Clinical examinations demonstrated bilaterally multiple superficial, epithelial and stromal anterior granular opacities in different stages of severity among three patients in this family.

Conclusions: This report describes a novel mutation in the TGFBI gene found in three family members affected by different phenotypic aspects. This mutation is associated with Thiel-Behnke corneal dystrophy; therefore, it could be considered a novel phenotype genotype correlation, which will help in genetic counselling for this family.

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Combination of apolipoprotein-A-I/ apolipoprotein-A-I binding protein and anti-VEGF treatment overcomes anti-VEGF resistance in choroidal neovascularization in mice

Yingbin Fu[3], Lingping Zhu[1,2], Mackenzie Parker[3,4], Nduka Enemchukwu[3], Megan Shen[3,4], Guogang Zhang[1,5], Qing Yan[2], James T. Handa[6] and **Longhou Fang[2,7]**

[1]The Xiangya Hospital of Central South University, China
[2]Department of Cardiovascular Sciences, Houston Methodist DeBakey Heart and Vascular Center, USA
[3]Cullen Eye Institute, Baylor College of Medicine, USA
[4]Rice University, USA
[5]The Third Xiangya Hospital of Central South University, China
[6]Wilmer Eye Institute, Johns Hopkins School of Medicine, USA
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Choroidal neovascularization (CNV) causes 80-90% of legal blindness due to age-related macular degeneration (AMD). Despite the dramatic success of anti-VEGF therapy, a significant number of patients are unresponsive to anti-VEGF agents. The mechanisms for anti-VEGF resistance are poorly understood. Here we explore the unique property of the apoA-I binding protein (AIBP) that enhances cholesterol efflux from endothelial cells (ECs) and macrophages, two cell types implicated in CNV, to thereby limit angiogenesis and inflammation to tackle anti-VEGF resistance in CNV. We show that laser-induced CNV in mice with increased age showed increased resistance to anti-VEGF treatment, which correlates with the increased intracellular lipid accumulation in macrophages. In young mice (6-10 weeks), AIBP is equally effective as an anti-VEGF neutralizing antibody in suppressing laser-induced CNV. In mice of intermediate age (8-10 months), the anti-VEGF agent shows decreased efficacy whereas AIBP shows the same efficacy as in treating young mice. In old mice (18 months), neither AIBP nor the anti-VEGF agent is effective in suppressing CNV. Remarkably, the combination of AIBP and anti-VEGF treatment overcomes anti-VEGF resistance and effectively suppresses CNV. Furthermore, macrophage depletion in old mice restores CNV sensitivity to anti-VEGF treatment and blunts the synergistic effect of combination therapy. These results suggest that cholesterol-laden macrophages play a critical role in inducing anti-VEGF resistance in CNV. Combination therapy by neutralizing extracellular VEGF and enhancing cholesterol removal from old macrophages is a promising strategy to combat anti-VEGF resistance in AMD.

Biography

Dr. Yingbin Fu is Associate Professor and Sarah Campbell Blaffer Endowed Chair in Cullen Eye Institute, Baylor College of Medicine. He received his Ph.D. degree in Biochemistry at Michigan State University and obtained his postdoctoral training in Johns Hopkins University School of Medicine. Dr. Fu is interested in studying the mechanisms of various forms of retinal degeneration including age-related macular degeneration (AMD) and to develop innovative treatment. Currently, he is working on two projects. The first is on the role of high temperature requirement factor A1 (HTRA1) and AMD. The second one is to develop a novel apoA-I binding protein (AIBP) based therapy for AMD by targeting cholesterol transport. His recent work uncovers a novel combination therapy of AIBP/apoA-I and anti-VEGF treatment in overcoming anti-VEGF resistance in the treatment of wet AMD. The significance of this study is highlighted by multiple press releases including the National Eye Institute.

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Evaluating the quality of glaucoma education for patients

Haaris M. Khan[2], Ammar M. Khan[1], Paul Huang[1], Kevin Warrian[1] and Patrick Gooi[1]

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[2]Faculty of Medicine, University of British Columbia, Canada

Purpose: To investigate the quality of glaucoma information found online using two different assessment tools.

Design: Cross-sectional survey of 100 websites found via Google search engine.

Methods: The terms "peripheral iridotomy" and "trabeculectomy" along with synonymous keywords were inputted into Google's search engine. The first 50 functional websites for each term were assessed by two independent raters using the DISCERN instrument as well as a quality assessment tool by the Journal of American Medical Association (JAMA). Statistical analysis included an evaluation of intra-rater reproducibility and interclass correlation between the two scales.

Main Outcome Measures: (i) Quality of website content based on DISCERN and JAMA Scores (ii) Quality of website based on categorization of website (iii) Intra-rater reproducibility of each scale (iv) interclass correlation between the two rating scales.

Results: Only 22% of the websites for peripheral iridotomy and 34% of the websites for trabeculectomy met all the criteria for JAMA's quality assessment. The mean DISCERN scores for peripheral iridotomy and trabeculectomy were 44 and 43.7, respectively, indicating poor quality. For the DISCERN scale, level of agreement between raters for each question ranged from k=0.550 (95% CI 0.700-1.026) to k=0.884 (95% CI 0.751-1.017). For the JAMA 4 scale, level of agreement for each question ranged from k=0.874 (95% CI 0.734-1.01) to k=1.00.

Conclusion: Our study indicates that information found online for two common ophthalmic procedures is of variable and poor quality. Thus, patients may be receiving misinformation online and better measures need to be implemented to avoid the dissemination of low-quality health information.

Biography

Haaris Khan is a 4th year medical student at the University of British Columbia. He completed his Bachelor of Science at Simon Fraser University in Biomedical Physiology. He is actively involved in Ophthalmology research with interests in Glaucoma, neuro-ophthalmology and oculoplastics.

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Bite and Sight: Is there a correlation

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[2]Head of Patricia Valerio Institute, Brazil
[3]Department of Life, Health and Environmental Sciences, University of L'Aquila, Italy

Aim: The aim of this study was to evaluate the correlation between malocclusions and visual defects. This is a case-control study evaluating the prevalence of visual defects in patients with different types of malocclusions.

Methods: One-hundred and sixty patients aged from 5 to 14 were evaluated using the ROMA index to detect malocclusion; the ones with the lowest scores were used as the control group. They were also submitted to visual-capacity inspection for motility and refractive disorders.

Results: Our work showed an enhanced prevalence of refractive defects or fusional vergence defects and alteration of eye movements (especially the saccades) in almost all dental malocclusions. Statistics: The Kappa test values for ROMA index were between 0.643 and 1.00 for the intraoperator agreement ($0.00 < p < 0.002$) and between 0.773 and 1.00 for the agreement between operators ($p = 0 < 0.001$). The statistically significance level for the correlation malocclusion/visual defects was set at $p < 0.05$. Statistical analyses were performed with the STATA software (version 15.0, Stata Corp LP, College Station, TX, USA).

Conclusion: Considering the high level of the statistical analysis and the accuracy of the methodology used, these data allows the establishment of a huge correlation between sagittal, transversal and vertical malocclusions with ocular disorders (myopia, hyperopia, astigmatism and ocular motility defects).

Table 1. Frequency distributions of vision defects, stratified for orthodontic condition.

Type of Visual Defects	Total	Control Group	Class II	Class III	Deep Bite	Open Bite	Cross Bite
	(*n* = 160)	(*n* = 52)	(*n* = 52)	(*n* = 9)	(*n* = 36)	(*n* = 15)	(*n* = 34)
Myopia, *n* (%)							
Absent	102 (64.97)	39 (76.47)	20 (38.46)	8 (88.89)	20 (58.82)	9 (60.00)	33 (97.06)
Present	55 (35.03)	12 (23.53)	32 (61.54) *	1 (11.11) °	14 (41.18) °	6 (40.00) °	1 (2.94) ***
Astigmatism, *n* (%)							
Absent	119 (74.84)	46 (88.46)	41 (78.85)	4 (44.44)	29 (82.86)	8 (53.33)	17 (50.00)
Present	40 (25.16)	6 (11.54)	11 (21.15) °	5 (55.56) **	6 (17.14) °	7 (46.67) **	17 (50.00) *
Hyperopia, *n* (%)							
Absent	123 (77.85)	42 (82.35)	43 (82.69)	8 (88.89)	21 (60.00)	10 (66.67)	33 (97.06)
Present	35 (22.15)	9 (17.65)	9 (17.31) °	1 (11.11) °	14 (40.00) ***	5 (33.33) °	1 (2.94) ***
Latent strabismus, *n* (%)							

Absent	117 (73.58)	46 (88.46)	31 (59.62)	4 (44.44)	25 (71.43)	13 (86.67)	21 (61.76)
Present	42 (26.42)	6 (11.54)	21 (40.38) **	5 (55.56) **	10 (28.57) °	2 (13.33) °	13 (38.24) **
Manifested strabismus, *n* (%)							
Absent	116 (72.96)	46 (88.46)	33 (63.46)	4 (44.44)	21 (60.00)	13 (86.67)	21 (61.76)
Present	43 (27.04)	6 (11.54)	19 (36.54) **	5 (55.56) **	14 (40.00) **	2 (13.33) °	13 (38.24) **
Saccadic ability, *n* (%)							
Absent	98 (61.64)	29 (55.77)	30 (57.69)	4 (44.44)	23 (65.71)	12 (80.00)	21 (61.76)
Present	61 (38.36)	23 (44.23)	22 (42.31) °	5 (55.56) °	12 (34.29) °	3 (20.00) °	13 (38.24) °
Tracking ability, *n* (%)							
Absent	109 (68.99)	40 (78.43)	30 (57.69)	4 (44.44)	22 (62.86)	12 (80.00)	23 (67.65)
Present	49 (31.01)	11 (21.57)	22 (42.31) ***	5 (55.56) ***	13 (37.14) °	3 (20.00) °	11 (32.35) °

Saccadic precision, *n* (%)							
Absent	111 (69.81)	40 (76.92)	31 (59.62)	4 (44.44)	25 (71.43)	11 (73.33)	22 (64.71)
Present	48 (30.19)	12 (23.08)	21 (40.38) °	5 (55.56) °	10 (28.57) °	4 (26.67) °	12 (35.29) °
Tracking precision, *n* (%)							
Absent	115 (72.33)	43 (82.69)	31 (59.62)	4 (44.44)	25 (71.43)	12 (80.00)	22 (64.71)
Present	44 (27.67)	9 (17.31)	21 (40.38) ***	5 (55.56) **	10 (28.57) °	3 (20.00) °	12 (35.29) °
Mov Head/body, *n* (%)							
Absent	117 (73.58)	44 (84.62)	31 (59.62)	4 (44.44)	27 (77.14)	12 (80.00)	21 (61.76)
Present	42 (26.42)	8 (15.38)	21 (40.38) **	5 (55.56) **	8 (22.86) °	3 (20.00) °	13 (38.24) **
Visual defects, *n* (%)							
Absent	74 (47.13)	26 (50.98)	21 (40.38)	4 (44.44)	18 (51.43)	8 (53.33)	15 (45.45)
Present	83 (52.87)	25 (49.02)	31 (59.62) °	5 (55.56) °	17 (48.57) °	7 (46.67) °	18 (54.55) °

Biography

Patrícia Valério.

- Jaw Functional Orthopedics Specialist
- PhD in Physiology, Federal University of Minas Gerais, Brazil
- Pos-Doc Junior as CNPq Researcher, Brazil
- Pos-Doc Senior as FAPEMIG Researcher, Brazil
- Invited professor at Aveiro University, Portugal; Marmara University, Turkey; Ioannina University, Greece.
- Professor at WSEI, Lisbon, Portugal and Biofokus, Turkey
- Speaker in more than 10 different countries

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Histological effects of intravitreal injection of antifungal agents in New Zealand White Rabbits: An electron microscopic and immunohistochemical study

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Background: Fungal endophthalmitis is a serious and vision-threatening infection which requires immediate and effective treatment approach. Our research aims to elucidate the histological effects of the intravitreal injection of the maximum safe dosage of voriconazole and micafungin on retina.

Methods: Six albino New Zealand White Rabbits were used. In experimental animals, a solution of voriconazole (Group V) or micafungin (Group M) was intravitreally injected in the right eye, while in control animals, balanced salt solution was intravitreally injected in the left eye (Group C). Euthanasia was performed ten days post injection and retina was removed and prepared for histological examination with light and electron microscope.

Results: Eosin-hematoxylin staining did not reveal any pathological changes in any of the samples examined. The immunohistochemical staining for TNF-a marker was detected as negative (-) in all samples, while IL-6 marker was detected as mild only in the group injected with voriconazole. Electron microscopy revealed several ultrastructural alterations in retinal layers in both groups of experimental animals.

Conclusion: Histological retinal lesions revealed with electron microscopy in the present investigation, raises the question of the safe usage of these antifungal agents in the treatment of fungal intraocular infections in the future.

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Persistent accomodative spasm case associated with acute stress disorder only responded to Atropine Sulfate, Alprazolam and Sertraline

Nilay Akagun

Liv Hospital, Turkey

Accommodative spasm is an isolated condition where there is a greater accommodative response to accomodative stimulus.

Symptoms include blurred vision, headache and diplopia. Psychological, neurological disorders and cholinergic drugs are mostly reported as etiology.

Accomodative spasm usually resolves spontaneously but in some cases it can persist for a long time. Treatment options are cycloplegic drugs, added plus lenses and the patient should be informed about visual hygiene. Clinicians should investigate the underlying conditions and treatment methods. We report a 17 year old female patient with acute stress disorder associated accommodative spasm who did not respond to cycloplegic drugs, added plus lenses but recovered with alprazolam,sertraline and atropine sulfate treatment.

The near response complex includes three elements: Accommodation, convergence and pupillary constriction. Accommodation is a physiological reflex modifying the curvature and shape of the lens, so as to focus objects at different distances. Contraction of the ciliary muscle causes a relaxation of zonular fibers resulting in change of the thickness and curvature of the crystalline lens to obtain an in-focus retinal image and clarity of vision. Therefore accommodative spasm is a rare condition due to an imbalance between excitatory and inhibitory pulses of accommodation. The most probable etiology for accommodative spasm is phychogenic factors. A short acting drug like cyclopentolate may not resolve the spasm. Best treatment option is atropine sulfate %1 beside side effects. Accomodative spasm can be persistent in some patients especially arising from psychogenic factors. Patients diagnosed with isolated accomodative spasm or spasm of near reflex must be investigated about neurological and psychological disorders. Management of stress and treatment of psychological and neurological disorders is obviously important in these cases.

Biography

Nilay Akagun has completed her medical education at the age of 23 years from Ankara University Faculty of Medicine and completed residency program from Ankara Research and Training Hospital. She is ophthalmology specialist in Liv Hospital Ankara Turkey. She has published in many medical journals.

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Accepted Abstracts

Novel visualization and measurements of ONH region in OCT images

Abdel-Razzak Al-Hinnawi

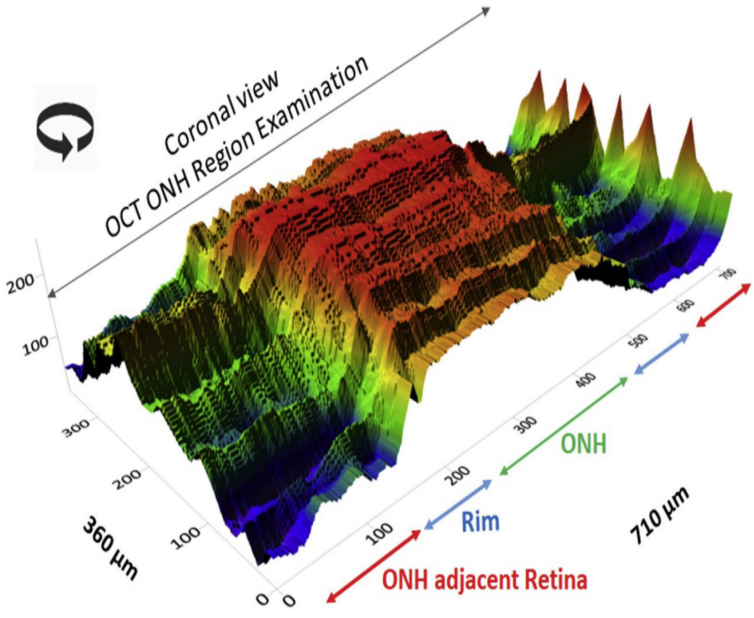
Isra University, Jordan

Objectives: To integrate findings from three research efforts explaining innovative 3D visualization of ONH region from OCT images and innovative measurements. The three papers were published by the author.

Scope: Neuro-Ophthalmology

Methods: B-Scan OCT Images from the Heidelberg SPECTRALIS OCT machine were utilized. Digital Image Analysis aspects were used to generate new measurements and innovative 3D presentation of ONH surface's shape.

Results: In the first paper, three new indexes of ONH cup-shape were proposed. The statistical difference between measurements on normal and glaucoma eyes was remarkably significant (p value < 0.001), indicating suggestive capability to discriminate OAG from normal eyes. In the second paper, an innovative 3D surface presentation of ONH from the Heidelberg SPECTRALIS OCT device was designed. It relies on the original OCT frames, without human or technological interference. It permits ophthalmologists to visually perceive the entire changes in the ONH



morphology during follow-up visits. Innovative measurements of ONH surface roughness were introduced to estimate the ONH shape's disparities during follow-up attendances. The percentage disparity was 3% or almost zero, but it can be as large as 100%.

In the third paper, an innovative volume calculation of the ONH region was explained. The new parameter, which was called OCT ONH coronal volume, was compared with the common ONH region's volume produced in the Heidelberg SPECTRALIS OCT machine. The results showed a significant difference (p-value < 0.001) from the common ONH region's volume.

Conclusions: The approximation of OCT ONH 3D surface is feasible from OCT B-Scan, revealing the 3D morphological shape of the ONH's anatomical constituents (the ONH nearby retina, rim, ONH itself, and Lamina Cribrosa). Therefore, ONH perception and thus measurements (e.g. roughness, volume, and the common metrics) can be made more accurately. This is a revolutionary improvement to neuro-ophthalmology, permitting future clinical benefits.

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Erythropoietin and soluble CD44 levels in patients with primary open-angle glaucoma

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[2]Department of Medical Biochemistry, Mansoura University, Egypt

[3]Department of Clinical Pathology, Mansoura University, Egypt

Objectives: To investigate the levels of erythropoietin (EPO) and soluble CD44 (sCD44) in the aqueous humor and plasma of human eyes with primary open-angle glaucoma,and to correlate their concentration with severity of glaucoma.

Patients and methods: Thirty patients with primary open-angle glaucoma (POAG) and twenty five patients with senile cataract (control group) of matched age and gender were included in the study prospectively.Aqueous humor samples were obtained by paracentesis from glaucoma and cataract patients who were undergoing elective surgery. Aqueous humor and corresponding plasma samples were analysed for EPO and sCD44 concentrations by enzyme linked immunosorbent assay.

Results: EPO and sCD44 levels were significantly higher in aqueous humor of POAG patients with respect to the compartive group of cataract patients (P<0.001).No significant difference in the levels of EPO and sCD44 in plasma of POAG and cataract patients.A high positive correlation was found between EPO and sCD44 in aqueous humor of POAG patients (P<0.001).Significant correlation was found between EPO or sCD44 levels and severity of visual field loss in mild and moderate stages (P<0.001) .

Conclusion: Increased levels of aqueous humor EPO and sCD44 may be associated with POAG. In addition, EPO and sCD44 may be useful proteins levels in aqueous humour of POAG patients as a result of glaucoma damage and not a cause. EPO and sCD44 concentrations in aqueous humour are a possible biomarkers for visual field loss in patients with POAG

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Trans-differentiation of bone marrow- derived mesenchymal cells into limbal lineage in rabbits

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[2]Department of Clinical Pathology, Cairo University, Egypt

Study design: Experimental prospective interventional study.

Purpose: To study the ability of mesenchymal cells (MCs) derived from the bone marrow of rabbits to be trans-differentiated into limbal lineage after in vitro co-culture with limbal cells.

Methodology: The corneal epithelium of one eye of twenty rabbits was destroyed either mechanically or chemically. MCs derived from the bone marrow were co cultured with cells derived from the Limbus. Trans-differentiation was identified by flow cytometry and clonogenic assay. MCs were then carried on amniotic membrane (AM) and transplanted to the affected corneal surface. Seven eyes were transplanted by co-cultured MCs and seven eyes were transplanted by non-co-cultured MCs. The effect of the transplanted cells on the corneal surface was assessed clinically, microscopically, and by immunohistochemistry.

Results: Flow cytometry showed that 79+8% of co-cultured cells had acquired limbal lineage criteria, while 59+5% of them had presented limbal stem cell criteria which showed an excellent positive correlation with their colony count. There was clinical improvement in 64% of the implanted eyes. This improvement was significantly more in eyes implanted by co-cultured mesenchymal cells than those implanted by non-co-cultured cells. Involvement of the inoculated cells in the regeneration was shown on microscopic sections. Presence of both mesenchymal and epithelial criteria of the implanted cells indicating trans-differentiation was proved by immunohistochemistry.

Conclusion: Mesenchymal cells derived from rabbits' bone marrow could be trans-differentiated into limbal lineage after ex-vivo co-cultured with limbal cells. Transplantation of these co-cultured cells could improve the injured ocular surface of rabbits.

Cone photoreceptor function loss mutants in the mouse

B. Chang, J. Wang, B. Fitzmaurice and **P.M. Nishina**

The Jackson Laboratory, USA

Objective & Scope: In this report, we first review the genotypes and phenotypes of cone photoreceptor function loss mutants that have been identified in our screening program, and second, list the mouse strains carry common cpfl mutations.

Results: Over the years, we have discovered 10 retinal cone photoreceptor function loss (cpfl1-10) mutants. The first cone photoreceptor function loss (cpfl1) is caused by a mutation in phosphodiesterase 6C, cGMP specific, cone, alpha prime (Pde6c) gene; cpfl3 is due to a mutation in guanine nucleotide binding protein, alpha transducin 2 (Gnat2) gene - the same mutation is carried in many strains with a similar genetic origin at the Jackson Laboratory; the cpfl10 is caused by a different mutation in the Gnat2 gene; cpfl5 is caused by a mutation in cyclic nucleotide gated channel alpha 3 (Cnga3) gene; cpfl8 is caused by a mutation in spectrin repeat containing, nuclear envelope 2 (Syne2) gene - two additional strains may carry different mutations in the Syne2 gene; cpfl9 is caused by a mutation in guanylate cyclase 2e (Gucy2e) gene; and other 4 have been mapped.

Methods used: We characterize the clinical effects of these mutations using longitudinal electroretinography (ERG), bright field retinal imaging with image-guided OCT, and histology. We also perform genetic analysis, including linkage studies, and examine candidate gene sequences to identify causative genes and mutations.

Conclusion: Mutations in the GNAT2 gene encoding the cone-specific □-subunit of transducin cause an early-onset autosomal recessive form of human achromatopsia 4; mutations in the CNGA3 gene cause human achromatopsia 2; and mutations in the PDE6C gene cause human cone dystrophy. A key feature of these human disorders is the absence of color discrimination. The mouse mutants identified here will provide models for studying the pathogenesis of autosomal recessive achromatopsia and cone dystrophy in humans.

Clear cornea after 4 decades of Sputnik IOL implantation

Chetan Chhikara and **Rajender Singh Chauhan**

Regional Institute of Ophthalmology, Postgraduate Institute of Medical Sciences, India

A case of Sputnik Intraocular Lens in a 65-year-old male who had history of trauma to his right eye 38 years back while cutting wood and was diagnosed with Intraocular foreign body in the anterior chamber, which was surgically removed. After 6 months, the patient developed traumatic cataract for which he underwent cataract surgery with Sputnik intraocular lens implantation. 6 months after surgery, the patient's Best Corrected distance Visual Acuity was 20/30 in the right eye. The patient was on regular follow-up and presented with complaint of diminution of vision in the left eye for which he underwent (OS) cataract surgery in 2010. Presently in March 2021 patient had complaint of diminution of vision in the (OD) with BCVA Counting finger at 3 meters and on examination patient was diagnosed with Posterior Capsular Opacification in right eye. B-Scan was within normal limits in the right eye and patient underwent (OD) Nd: YAG capsulotomy & appropriate treatment was advised. On review after 2 weeks BCVA in the right eye was 20/40. Fundus was normal and endothelial cell count was 1798 cells/mm2.

The Sputnik IOL lost favour in the 1980s and was replaced by a new generation of IOLs associated with fewer complications. It is now considered obsolete & may pose a surgical challenge for today's ophthalmologist. We report this case for its rarity because the cornea is healthy in the eye that had undergone implantation of a Sputnik IOL approximately four decades ago & as the Sputnik IOL is obsolete now a days management of such cases may be difficult.

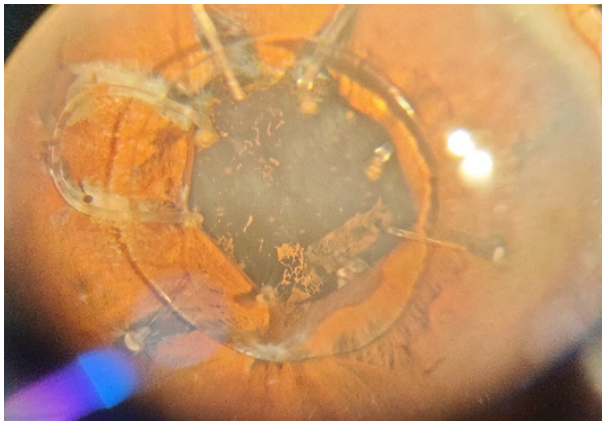

Figure1- *Anterior Segment photo showing Sputnik IOL with significant PCO.*

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Investigating the biology of the human eyelash follicle

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[1]Division of Cell Matrix Biology and Regenerative Medicine, School of Biological Sciences, University of Manchester, UK

[2]Manchester Royal Eye Hospital, UK

[3]Dr. Phillip Frost Department of Dermatology and Cutaneous Surgery, University of Miami Miller School of Medicine, USA

Eyelashes (ELs) play a fundamental role in ocular health by protecting the eye from debris and helping to prevent evaporation of the tear film. In addition, ELs have been consistently associated with human ideals of beauty throughout the ages, fueled by an increasing demand for cosmetics that enhance the length, thickness and shade of EL hairs. The prominent physiological and aesthetic role of ELs is apparent in conditions when EL growth/orientation goes awry, such as trichomegaly, hypotrichosis and trichiasis, demonstrating the clinical need for a deeper understanding of human EL physiology. The main goal of this research is to explore the biology of human ELs by focusing on the EL follicle, a structure which regulates eyelash growth, pigmentation and curl. We took advantage of surplus eyelid tissue containing intact EL follicles, removed during wedge excision, to analyze the EL follicle in vivo and in vitro. Histochemistry and immunofluorescence were used to identify key anatomical regions of the EL follicle such as the proliferative matrix, pigmentary unit, dermal papilla and club hair. This histological approach also allowed EL follicles at different stages of the hair growth cycle to be identified and quantified. Interestingly, isolated human anagen follicles continued to grow when cultured in vitro, providing an accessible way of assessing the mechanism of human EL growth. Current work in our lab is focused on investigating the stem cell niche of EL follicles in vivo and in vitro, with the aim of isolating stem cells for use in investigating skin repair/regeneration. In conclusion, our study shows that although human EL follicles share some characteristics with scalp hair follicles, certain aspects of their biology, such as the proportion of anagen/telogen follicles, are distinct. This demonstrates that more research is necessary in order to further understand this unique hair follicle.

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Influence of digital screen exposure and face mask wearing on symptoms of dry eyes

Georges Harb, Walid Harb and **Chahid Farah**

French Hospital of the Levant, Lebanon

Purpose: To assess the prevalence and severity of dry eye disease (DED) in a sample of University students, and to investigate the influence of digital screen exposure and face mask wearing on symptoms of dry eyes.

Methods: A survey was sent to 450 students which included the age, sex of the students, average time spent daily in front of a digital screen and the average time wearing a face mask daily. A copy of the OSDI questionnaire was also sent to these students and the final score collected. Using the IBM SPSS Statistics program, Pearson correlation coefficient was evaluated for OSDI final score and face mask time use and screen exposure time to evaluate if a correlation exists. Potential confounding factors were also controlled using partial correlations. An independent samples T-test was done to measure the relationship of OSDI with sex. A value of 0.05 was chosen for the type I error alpha value.

Results: 241 surveys and OSDI questionnaires were completed and returned with success. 67.6% of participants were found to have an OSDI final score >13 diagnosing them as having symptomatic DED. Sex was not found to influence OSDI final score (p=0.404). A positive correlation was found between screen exposure time and DED (r=0.286; p=0.000) and between face mask wearing time and DED (r=0.312; p=0.000). Sex was not found to be a confounder.

Conclusion: DED was found to be significant in this population. Two risk factors that were evaluated (face mask wearing and digital screen exposure) were found to be positively correlated with the severity of the symptoms. DED will probably increase as Covid pandemic continue partly due to these protective measures undertaken.

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NOVEMBER 09-10, 2021

Usability of selective laser trabeculoplasty as a first line treatment for glaucoma in Saudi Arabia

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Purpose: Glaucoma is the second leading cause of blindness worldwide. Early detection along with appropriate and timely effective treatment is crucial to alter disease progression. Selective laser trabeculoplasty has been proven its efficacy as a primary treatment for glaucoma that eliminates adherence issues and has a lower rate of complications. The aim of this study is to evaluate acceptance of ophthalmologist to use selective laser trabeculoplasty as a first line treatment for glaucoma in Saudi Arabia.

Method: This is a cross sectional study with 128 ophthalmologist who works in Saudi Arabia. A structured online questionnaire used for data collection. The questionnaire included sociodemographic data, current glaucoma practice, Technology Acceptance Model (TAM) and potential barriers of using SLT as a first line treatment for glaucoma.

Results: Of the 128 participants, the mean age was 40 ± 9.6, and 65.1% were male. Almost one third were glaucoma specialist and 89% followed the American Academy of Ophthalmology recommendation when they are managing glaucoma patient. Although, majority used medical treatment as a first line for glaucoma (96%), 72.7% agreed that SLT is safe and 59.4% agreed that it controls Intraocular pressure quickly. More than half of participants are willing to use SLT as a first line treatment, however, only 42.2% considered themselves experienced enough to do so. The most reported barriers were inadequate training, non-availability of SLT machine and low efficacy 47.7%, 41.4% and 27.3% respectively (table 1)

Conclusion: Despite the good overall acceptance of SLT as a first line treatment for glaucoma, majority of participants are still using medical therapy as a first line treatment. Inadequate training was the most reported barrier, therefore, to overcome the most reported causes of low SLT usage, ophthalmologist needs more training courses to be more efficient in doing it and implement it in their practice.

Table 1: Perceived barriers of SLT as a first line treatment for glaucoma

The Barrier		Glaucoma Specialists	Non-Glaucoma Specialists	Total
Patient age	Yes	9(25%)	22(23.9%)	31(24.2%)
	No	27(75%)	70(76.1%)	97(75%)
Patient refusal	Yes	9(25%)	17(18.5%)	26(20.3%)
	No	27(75%)	75(81%)	102(79.7%)
Low efficacy	Yes	15(41.7%)	20(21.7%)	35(27.3%)
	No	21(58%)	72(78.3%)	93(72.7%)
Inapplicability	Yes	12(33.3%)	18(19.6%)	30(23.4%)
	No	24(66.7%)	74(80.4%)	98(76.6%)
Low Safety profile	Yes	1(2.8%)	5(5.4%)	6(4.7%)
	No	35(97.2%)	87(94.6%)	122(95.3%)
Lack of availability	Yes	10(27.8%)	43(46.7%)	53(41.4%)
	No	26(72.2%)	49(53.3%)	75(58.6%)
Low tolerance threshold	Yes	6(16.7%)	6(6.5%)	12(9.4%)
	No	30(83%)	86(93.5%)	116(90.6%)
Cost of SLT	Yes	2(5.6%)	13(14.1%)	15(11.7%)
	No	34(94.4%)	79(85.9%)	113(88.3%)
Complications rate of SLT	Yes	2(5.6%)	4(4.3%)	6(4.7%)
	No	34(94.4%)	88(95.7%)	122(95.3%)
Inadequate training	Yes	9(25%)	52(56.5%)	61(47.7%)
	No	27(75%)	40(43.5%)	67(52.3%)
Other	Yes	3(8.3%)	14(15.2%)	17(13.3%)
	No	33(91.7)	78(84.8%)	111(86.7%)

*Other include start with medical treatment first, type of glaucoma, not glaucoma specialist

Classification of lung diseases using deep learning models

A. Krzyzak and **M. Zak**

Concordia University, Canada

We address the problem of medical data scarcity by considering the task of detection of pulmonary diseases from chest X-Ray images using small volume datasets with less than thousand samples. We implemented three deep convolutional neural networks (VGG16, ResNet-50, and InceptionV3) pre-trained on the ImageNet dataset and assesed them in lung disease classification tasks using transfer learning approach. We created a pipeline that segmented chest X-Ray (CXR) images prior to classifying them and we compared the performance of our framework with the existing ones. We demonstrated that pre-trained models and simple classifiers such as shallow neural networks can compete with the complex systems. We also validated our framework on the publicly available Shenzhen and Montgomery lung datasets and compared its performance to the currently available solutions. Our method was able to reach the same level of accuracy as the best performing models trained on the Montgomery dataset however, the advantage of our approach is in the smaller number of trainable parameters. Furthermore, our InceptionV3 based model is almost tied with the best performing solution on the Shenzhen dataset despite being computationally less expensive.

Parenteral fish-oil lipid emulsions in retinopathy of prematurity

Parisa Mohagheghi[1], Golnaz Gharebaghi[2], Ahad Sedaghat[3] and **Hamid Riazi-Esfahani[4]**

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[4]Tehran University of Medical sciences, Iran

Retinopathy of prematurity (ROP) is one of the leading causes of visual morbidity worldwide (1).

Although low gestational age and low birth weight are the two most important reasons for ROP incidence and severity, some other factors have been evaluated (2). Docosahexaenoic acid (DHA) is an omega-3 fatty acid and is required for brain growth and neurodevelopment (3,4). The daily DHA requirements of preterm infants would be higher (9,10s). In this study we evaluated the preventive value of parenteral fish-oil lipid emulsions in ROP.

Methods: This study was a retrospective, observational study with two different periods of time for data collection. We compared the ROP examinations of preterm infants who were treated with lipid emulsions between 2011–2013 with INTRAlipid® 20% which lacked fish oil and 2015– 2017 with SMOFlipid20%® [Fresenius Kabi AB, Uppsala, Sweden] containing fish oil

Results: Three hundred and forty-one infants were enrolled in this study, 187 infants received INTRAlipid regimen, and 154 infants received SMOF lipid. Although there was no significant difference between ROP stages among the two groups (P = 0.41), in subgroup analyses, Stage 3 occurred significantly lower in the SMOFlipid group compared to the INTRAlipid group (14% vs. 9%; P = 0.04). Need for the treatment with either laser or anti-VEGF was lower in the SMOFlipid group than in the INTRAlipid group, although it was not significant (15.4% vs. 20.9%; P = 0.51).

Conclusion: This study showed no reduction in the need for the treatment in ROP infants who received SMOFlipid compared to INTRAlipid infusion.

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Glistenings evaluation of the first generation of AcrySof material of 1990's

Qiang Wang[1], Timur M. Yildirim[2], Sonja K. Schickhardt[2], Grzegorz Łabuz[2], Ramin Khoramnia[2], Patrick R. Merz[2], Hyeck-Soo Son[2], Donald J.Munro[2], Elfriede Friedmann[2] and **Gerd U. Auffarth[2]**

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[2]David J. Apple International Laboratory for Ocular Pathology, Department of Ophthalmology, University of Heidelberg, Germany

Purpose: To reproduce and evaluate glistenings of explanted 3-piece hydrophobic acrylic intraocular lenses of the initial Acrysof material implanted between 1994 to 1997 in the US.

Methods: Twenty five 3-piece hydrophobic acrylic IOLs (Acrysof, Alcon, Fort Worth, USA) that were explanted and sent to the D.J.Apple Laboratory were from the central optic. The amount of the glistenings was quantified using a professional image analysis system. between 1994 to 1997 were evaluated. Microscopic pictures of the 25 3-piece hydrophobic acrylic IOLs (original magnification X 14 and X 90) were taken under both dry and wet conditions. Then an experimental set up to visualize glistenings was applied. The IOLs were placed inside a water bath setting at a constant temperature of 37°C for 10 days. During the following 10 days, each IOL was repeatedly removed from the oven and photographs.

Results: The amount of glistenings was found to be variable in the IOLs during incubation at 37°C. Among all the 25 pieces of IOLs, 5 IOLs presented with 0-500 microcacuoles/mm² (MV/mm²), 11 IOLs showed 500-2000 MV/mm², 9 IOLs were found to have extreme high numbers of 2000-3500 MV/mm².

Discussion and Conclusion: Glistenings could be reproduced in the explanted IOLs immersed in the water bath at constant 37°C by simulating human body temperature and seem to be variable in the following 10 days. Despite of the same type of IOLs, the amount of reproduced glistenings in IOLs are different from each other under the same conditions and were roughly classified into 3 groups. The differences probably have relationship with the manufacture process, Lot-number and implant duration. Compared to similar studies at our laboratory with current hydrophobic acrylic IOLs of the same manufacturer the glistenings numbers were 10x higher in the 1990's IOL.

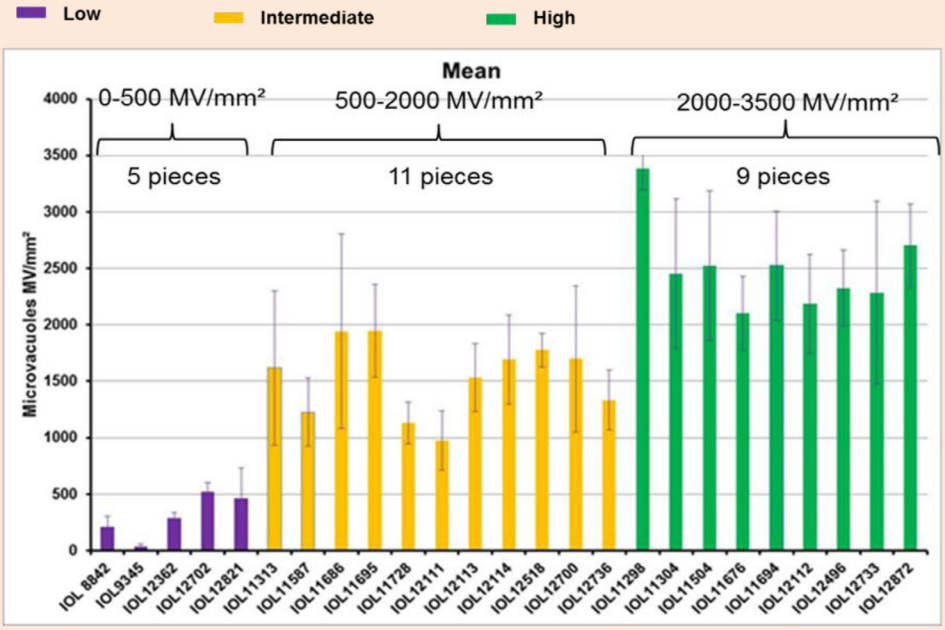

Figure 1:Different mean value is compared among Low Glistening group 0-500 MV/mm², Intermediate Glistening group 500-2000 MV/mm² and High Glistening group 2000-3500 MV/mm²

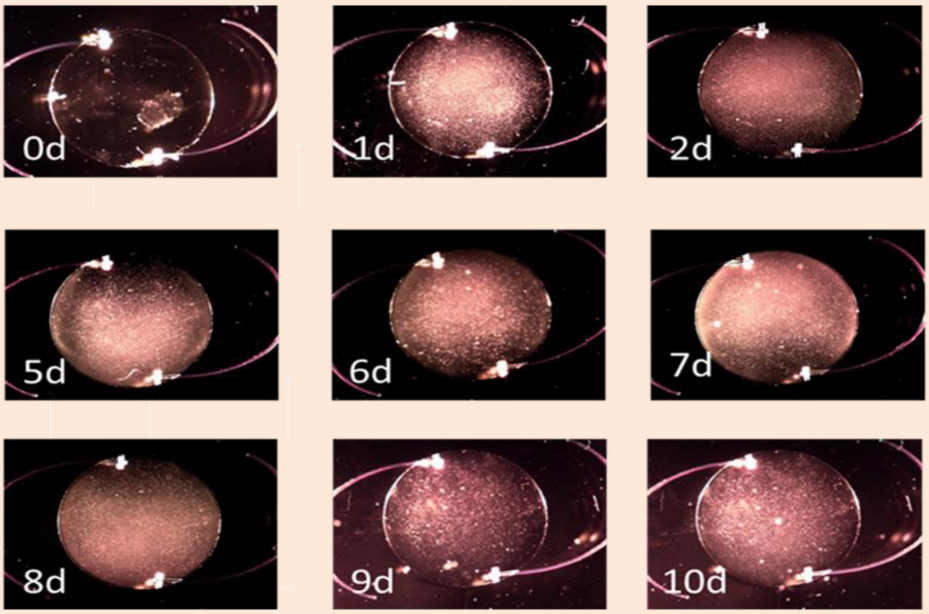

Figure 2:**For example: High glistening group:**Daily images of IOL 12496 (magnification x14) over 10 days. The lens was removed and examined approx. 5 minutes after immersion in 37° C saline (the 0d image) and removed again after 24 hours (image 1d), 48 hours (2d), 144 hours (6d), 168 hours (7d), 192 hours (8d) 216 hours (9d) and 240 hours (10d).

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Non-Invasive multimodal OCT-SLO-OCTA imaging system for diagnosis of diabetic retinopathy and nanotherapeutics

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Early diagnosis of diabetic retinopathy is the most challenging diabetic complication for ophthalmologists. Surgical/invasive methods cause chronic post-operative discomforts and permanent pain in patients. Our research is focused on non-invasive diagnosis and therapy. In pursuit of this, a multimodal OCT-SLO-OCTA hybrid imaging system with advanced laser optics was developed recently. This system is a non-destructive imaging modal used for diagnosis of ocular diseases through real-time 3D animal imaging. Also, the administration of pharmaceuticals for treatment of retinopathy through systemic or topical route lacks safe and effective delivery at the site of infection. This is due to the fact that the drug candidates often experience inefficiencies with the presence of blood retinal barrier in ocular region. Development of appropriate carrier systems for the delivery of active molecules to the target is essential. Our methodology is completely a non-invasive strategy of imaging based simultaneous diagnosis and treatment using drug loaded soft polymeric carrier as implant for the delivery of active pharmaceuticals. The treatment for retinopathy is aided by various polymeric carrier systems incorporated with therapeutic molecules through covalent chemistry. We have developed a soft hydrogel lens as implant for the sustained delivery of drugs to the retinal layers. Preliminary studies were done to investigate its physiochemical properties. The developed soft contact lens shown excellent biocompatibility when tested with animal cell lines. This is an interdisciplinary research work with the integration of chemistry, biology, engineered laser optics and nanotechnology for biomedical imaging and clinical therapeutics.

An unusual traumatic lamellar laceration of cornea

Rakesh Barot and **Amar Karkhanis**

Rajiv Gandhi Medical College & C.S.M Hospital, India

Lamellar laceration of the cornea may occur following ocular trauma. The management of lamellar laceration will depend on whether the lacerated corneal flaps are displaced or undisplaced. We hereby report an unusual case of large traumatic lamellar corneal laceration in right eye in a 14-year-old girl presenting with diminution of vision. Slit lamp biomicroscopic examination showed partial thickness corneal flap of 11.5mm X 7mm from 11o'clock to 6 o'clock position with 3 mm superonasal displacement associated with stromal folds and shifting of inferior limbus and conjunctiva. Surgery was the appropriate option which included visualization of inferior limbus by incising conjunctiva, repositioning of displaced corneal flap and securing it with sutures. Immediate examination and proper surgical management of lamellar corneal injuries results in good visual outcome and prevention of complications like fibrous ingrowth and infection

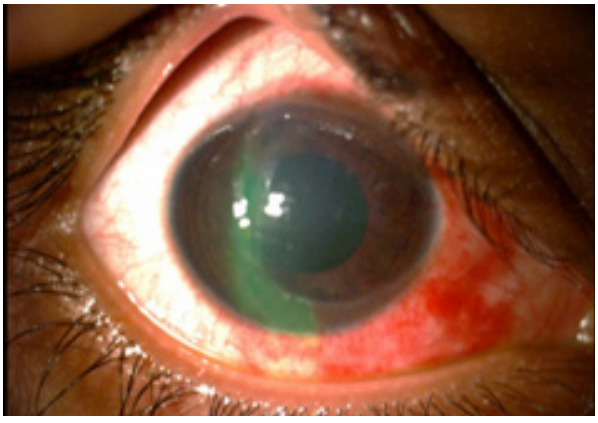

Figure 1: Day-1 showing displaced corneal and conjunctival flap with blood pigments in the interface

Figure 2: Slit lamp microscopic photograph at one year after surgery

Comparison of optic disc parameters with OCT angiography in patients followed up for keratoconus

Sibel Zirtiloglu

Health Science University, Bakirkoy Dr. Sadi Konuk Training and Research Hospital, Turkey

Aim: Our aim of the study to evaluate optic disc circulation in keratoconus patients with OCT angiography.

Method: Patients followed in the cornea clinic of Health Sciences University, Bakirkoy Dr. Sadi Konuk Training and Research Hospital were included in the study. After visual acuity, intraocular pressure, anterior and posterior segment examination, corneal parameters with Sirius Tomography, and RNFL and optic disc, peripapillary vessel density values with Optuvue RTVue were evaluated with OCT angiography.

Results: Mean age of keratoconus patients was 31± 9,08. 18 female and 24 male patients were included in the study. 10 (23%) patients had a history of cross-linking, 32 (76%) patients had no history of cross-linking. 26 patients were staged according to Amsler-Krumeich system as stage 1 (37.1%), 8 patients as stage 2 (11.4%), 4 patients as stage 3 (5.7%) keratoconus. RNFL inferior, RNFL nasal peripapillary (RPC) vessel density (VD) whole, RPC VD inferior values were statistically significantly lower than the control group ($p = 0.26$, $p < 0.001$, $p = 0.006$, $p < 0.001$, respectively). RPC VD inferior value was found to be statistically significantly lower in those with a history of cross-linking.

Conclusion: Choroidal and retinal circulation changes have been observed in patients with keratoconus in previous studies. In addition, the measured intraocular pressure values are not always reliable because corneal thicknesses differ from the normal population. Optic disc changes can be overlooked when focusing on anterior segment examination. According to this study, keratoconus does not seem to be a disease that only affects the anterior segment.

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Snakebite tissue damage and ophthalmia

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The direct contact of the eye with venom causes hyperemia, uveitis, and corneal erosions. However, most snakes inject the venom directly at the feet or hands, located far from the eye. When envenomated, poisonous components of the venom are circulated to every part of the body by blood circulation. Eventually some toxic components reach the eye producing ocular hemorrhage, ocular muscle paralysis, ptosis, and diplopia.

Pathological effects of snake envenomation on ophthalmia should not be ignored because it may cause blindness in severe cases antivenins are effective therapeutic medicines, however, they are very specific and good only for specific snakebites. The antivenin should be administered immediately, the sooner the better. The monovalent antivenin is usually more effective than polyvalent antivenin.

In this presentation the cause of different ophthalmic problems will be discussed as well as the venom component responsible for the specific pathologic effect.

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Transorbital-penetrating intracranial injury due to a homemade metal arrow: A case report

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A transorbital-penetrating intracranial injury (TOPI) is an unusual traumatic brain injury. This rare injury has the potential to result in serious and fatal brain damage with a high mortality rate and requires prompt multidis- ciplinary surgical intervention. Here, we describe an interesting case in which a patient who presented with accidental penetrating injuries of the brain was found to have a transorbital-penetrating intracranial injury (TOPI). We chose an anterior approach to the foreign body above the entrance wound for removal in a retrograde manner with fluoroscopic guidance. The patient remained well with no complications and was discharged on postoperative day 10. Reasonable diagnostic imaging, surgical planning, and careful post-surgery management can increase patients successful outcomes.

1 year follow up of polymethyl methacrylate glaucoma drainage device in refractory glaucoma

Virna Dwi Oktariana Asrory

Cipto Mangunkusumo Hospital, Universitas Indonesia, Indonesia

Objectives: To evaluate the efficacy and safety of polymethyl methacrylate glaucoma drainage device known as Virna Glaucoma Implant in a year follow up.

Methods: this is a single arm clinical study in refractory glaucoma patients from 2016-2019. The subjects varied from failed previous surgery in primary glaucoma to secondary glaucoma due to uveitis, neovascularization, surgery, trauma or medication. The patients were followed up 1 month, 3 months, 6 months and 12 months post operatively. The IOP, anterior and posterior segments, drugs being used, complications and additional treatments were noted.

Results: 167 patients had VGI and completed the follow up for 1 year. The frequent cause of refractory glaucoma in this study was secondary glaucoma, especially due to rubeotic and silicone oil. The IOP preoperative, 1 month, 3 months, 6 moths and 12 months was 38.84 ± 11.04 mmHg, 19.18 ± 11.34 mmHg, 17.95 ± 9.35 mmHg, 15.23 ± 7.39 mmHg, and 15.40 ± 8.94 respectively. The medication pre operative and 1 year follow up was 2.9 ± 1.1 and 1.3 ± 1.1. One patient need tube extraction in a year follow up, and no infection was noted.

Conclusion: The PMMA GDD seems effective and safe in refractory glaucoma cases during 1 year follow up.

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