ABSTRACTS

Neuro-Ophthalmic Literature Review

David Bellows, Carmen Chan, John Chen, Hui-Chen Cheng, Rauan Kaiyrzhanov, Peter MacIntosh, John Pula, Matthieu Robert, Michael S. Vaphiades, and Sui Wong

OCT and worsening multiple sclerosis

Knier B, Leppenietier G; Wetzlmair C, Aly L, Hoshi M, Pernpeintner V, Biberacher V, Berthele A, Muhlau M, Zimmer C, Hemmer B, Korn T, Association of Retinal Architecture, Intrathecal Immunity, and Clinical Course in Multiple Sclerosis. *JAMA Neurol* 2017;74(7):847–856.

Ocular coherence tomography (OCT) has become a valuable tool in evaluating patients with multiple sclerosis either with or without optic neuritis. This study had two goals. The first is to see if there is a correlation between certain retinal OCT volumes and two cerebrospinal fluid (CSF) variables: immune cell populations and immunoglobulin indices. The second goal of the study is to assess the correlation between certain retinal OCT volumes, certain cerebrospinal fluid variables, and worsening of disease. The retinal volumes that the investigators measured were the combined ganglion cell/inner plexiform volume (GCIPL) and the inner nuclear layer (INL). The CSF variables measured included the populations of B cells, CD56bright natural killer (NK) cells, and the immunoglobulin synthesis rate.

Three hundred and twelve patients were separated into two cohorts. The first cohort (72 patients) were newly diagnosed with relapsing remitting multiple sclerosis. The second cohort (240 patients) were those who had disease durations of one year or greater. This second group of patients did not undergo lumbar puncture. The primary outcome variable was worsening disability as measured by the Expanded Disability Status Scale (EDSS).

The study showed that low retinal ganglion cell/inner plexiform layer volume on OCT is associated with; an elevated intrathecal CD19 + B-cell response, a higher rate of immunoglobulin

synthesis, and future disability worsening. A higher inner nuclear layer volume was found to be positively correlated with an increased frequency of intrathecal CD56bright natural killer (NK) cells and a greater amount of disease activity as measured on MRI. The value of this study to the clinician is that at an earlier stage of disease, OCT may help identify those patients who are at a greater risk of worsening and who may, therefore, benefit most from early intervention.

David Bellows

Tocilizumab reduces steroid dose by half in temporal arteritis

Stone JH, Tuckwell K, Domenico S, Kerman M, Avinger M, Blackmans D, EBrouwer E, Cid MC, Dasgupta B, Reach J, Savarino C, Schutte G, Schulze-Koop H, Piera R, Union SH, Collinson N. Trial of Tocilizumab in Giant-Cell Arteritis. *N Engl J Med* 2017;377:317–328.

A breakthrough in the management of giant cell arteritis occurred in May 2017 when the Food and Drug Administration approved the use of subcutaneous tocilizumab for the treatment of giant cell arteritis. That decision was largely based on this important study which showed that the cumulative dose of prednisone used to treat giant cell arteritis can be cut approximately into half with the addition of tocilizumab to the treatment regimen.

This randomised clinical trial assessed the efficacy of a combination subcutaneous tocilizumab (162 mg) with a prednisone taper versus a prednisone taper alone in the treatment of giant-cell arteritis. The primary outcome was the rate of steroid-free remission at week 52.

Two hundred and fifty-one patients were randomly assigned to one of four groups (216 patients completed the trial): 100 patients received

injections of tocilizumab weekly with a 26-week prednisone taper. Fifty patients received injections of tocilizumab every other week with a 26-week prednisone taper. Fifty patients received weekly injections of placebo with a 26-week prednisone taper. Fifty-one patients received weekly injections of placebo with a 52-week prednisone taper.

Primary outcome: In the patients who received tocilizumab, 56% of the those who received injections weekly and 53% of those who received injections every other week had sustained remission at 52 weeks. In the placebo groups, 14% who underwent a 26-week taper and 18% of those who underwent a 52-week taper achieved remission. Secondary outcomes: Those patients in the tocilizumab group had an approximately 50% reduction in the rate of “flares” as compared to the placebo group. A “flare” was defined as a recurrence of the signs or symptoms of giant cell arteritis or an elevation of the sedimentation rate to 30 mm or greater per hour.

One of the most important outcomes of this study is related to the cumulative dose of prednisone over the 52-week period. Those patients who received tocilizumab (either weekly or every other week) had a cumulative dose of 1862 mg as compared to the placebo group who received 3296 mg over the 26-week taper and 3818 mg over the 52-week taper. The rates of adverse events did not differ between the trial groups. It should be noted, however, that 4% of patients receiving tocilizumab developed neutropenia.

David Bellows

Optic nerve drusen and OCT

Ghassibi MP, Chien JL, Abumasmah RK, Liebmann JM, Ritch R, Park SC. Optic Nerve Head Drusen Prevalence and Associated Factors in Clinically Normal Subjects Measured Using Optical Coherence Tomography. *Ophthalmology* 2017 Mar;124(3):320–325.

Suspected optic disc swelling is a frequent cause of referral to the neuro-ophthalmologist and optic nerve head drusen (ONHD) is a common cause of pseudopapilloedema. Amongst the many ways of detecting ONHD (ophthalmoscopy, autofluorescence, computed tomography, and ultrasound B-Scan), B-scan has been the most reliable, but it

is still not regarded as the gold standard. In recent years, there have been many reports of using optical coherence tomography (OCT) to detect ONHD, especially with extended depth imaging (EDI-OCT). In a previous paper by the same group, the authors established that eyes with clinically definite ONHD had a signal-poor core surrounded by horizontal hyperreflective bands perpendicular to the OCT beam using Spectralis EDI-OCT. These eyes also had isolated horizontal hyperreflective bands without the signal-poor core. The authors postulated that these isolated bands represent subclinical drusen. Thirty-four eyes of 21 patients with clinically definite ONHD were used to determine the minimum length of these hyperreflective bands which could be interpreted as ONHD and to distinguish them from noise. The minimum length was set at 45 microns. The authors then performed EDI-OCT on 260 eyes of 130 normal patients. Horizontal hyperreflective bands were identified in 28 eyes [10.8%] (3 with signal-poor core and 25 without). B-scan revealed hyperechoic ONH lesions in the 3 eyes with signal-poor core, but not in the 25 without. It was found that the presence of these hyperreflective bands (with or without signal-poor cores) was associated with smaller optic disc and shortened axial length. The authors postulated that these isolated horizontal hyperreflective bands represented subclinical ONHD and concluded the prevalence of subclinical ONHD was more prevalent [10.8% of eyes] than previously shown [up to 3.7%]; however histological proof is necessary to demonstrate if these hyperreflective bands are truly representative of ONHD.

Carmen Chan

Alzheimer's disease and trouble sleeping? Blame it on the melanopsin retinal ganglion cells

La Morgia C, Ross-Cisneros FN, Koronyo Y, Hannibal J, Gallassi R, Cantalupo G, Sambati L, Pan BX, Tozer KR, Barboni P, Provini F, Avanzini P, Carbonelli M, Pelosi A, Chui H, Liguori R, Baruzzi A, Koronyo-Hamaoui M, Sadun AA, Carelli V. Melanopsin retinal ganglion cell loss in Alzheimer disease. *Ann Neurol* 2016; 79:90–109.

The authors conducted an analysis of melanopsin retinal ganglion cells in patients with Alzheimer's

disease (AD). There were two cohorts; one was an in vivo analysis using optical coherence tomography (OCT), the other was postmortem analysis of melanopsin retinal ganglion cells and A β plaque. The in vivo cohort supported other OCT studies showing a reduction in the retinal nerve fibre layer (RNFL) thickness in AD compared to controls. Interestingly, they did not find that RNFL thickness correlated with degree of dementia, age of onset, or disease duration. However, they only evaluated AD patients with mild to moderate AD due to the difficulty in obtaining OCT on patients with severe AD. Patients with AD had variable amounts of circadian dysfunction, which did not correlate with the OCT RNFL thickness or severity of dementia.

While the OCT data have been shown in the past and is not novel, the key to their study was their postmortem analysis on a separate cohort of AD patients. In these patients, they found a decrease in the density of melanopsin retinal ganglion cells that may precede the loss of normal retinal ganglion cells. The remaining melanopsin retinal ganglion cells had abnormal morphology, including smaller soma and thinner dendrites. They also confirmed the presence of A β deposition in the retina, which were found to co-localise within and around melanopsin retinal ganglion cells. A β plaques were also found in other locations in the retina, including around blood vessels. This study provides evidence that AD does affect the retina and may selectively affect some pathways more than others. Future studies evaluating for circadian dysfunction and OCT in vivo followed by postmortem analysis of the same cohort of patients will be required to make a firm connection between the loss of melanopsin retinal ganglion cells and circadian dysfunction.

John Chen

Optic disc haemorrhages and poor visual outcome in pseudotumor cerebri

Wall M, Thurtell MJ for the NORDIC Idiopathic Intracranial Hypertension Study Group

Optic disc haemorrhages at baseline as a risk factor for poor outcome in the Idiopathic Intracranial Hypertension Treatment Trial. *Br J Ophthalmol* 2017 Sep;101(9):1256–1260.

The authors reviewed the data from the idiopathic intracranial hypertension treatment trial (IIHTT) for fundoscopic abnormalities that were associated with poor visual outcome. Overall, 27.2% of subjects had optic disc haemorrhages in the nerve fibre layer. Haemorrhages were seen in patients with higher degrees of papilledema and patients with higher baseline cerebral spinal fluid pressures. Five of seven patients that met the criteria for treatment failure had optic disc haemorrhages, which suggests optic disc haemorrhages are a risk factor for poor visual outcome. However, there was no correlation between optic disc haemorrhages and the perimetric mean deviation change so the presence of optic disc haemorrhages do not necessarily mean a poor outcome. Regardless, if optic disc haemorrhages are present, patients are likely to have higher degrees of papilledema and should be followed closely and more aggressive therapy can be considered.

John Chen

Ultrasound remains the gold standard for optic nerve head drusen

Caramoy A, Engel L, Koch KR, Kirchhof B, Cursiefen C, Heindl LM. Multiple imaging modalities for the detection of optic nerve head drusen: Is echography still mandatory? *Acta Ophthalmol* May 2017;95(3):320–323.

The authors compared multiple imaging modalities in detecting optic disc drusen. The study provides excellent examples for how optic disc drusen look on spectral domain OCT, enhanced depth OCT, swept source OCT, and autofluorescence. The authors also discuss ways of differentiating blood vessels from optic disc drusen on OCT, where the latter typically has a hyporeflective filling with hyper-reflective dots surrounding the drusen.

Although these imaging modalities do well with superficial drusen, the authors noted that eyes with buried disc drusen had no hyper-reflective material seen on autofluorescence and OCT did not penetrate far enough to detect the drusen. For this reason, SD-OCT, EDI-OCT, SS-OCT, and fundus autofluorescence all had a sensitivity of about 80% while ultrasound was

100% sensitive in detecting optic disc drusen. Buried optic disc drusen are the ones that are not readily apparent on funduscopy and often present to clinic as possible papilledema. Therefore, while OCT and autofluorescence provide visually-appealing pictures of calcified superficial optic disc drusen, ultrasound remains the gold standard.

John Chen

MOG-antibody & disease patterns in paediatric demyelinating syndrome

Hennes EM, Baumann M, Schanda K, et al. Prognostic relevance of MOG antibodies in children with an acquired demyelinating syndrome. *Neurology* 2017;89:900–908.

The introduction of antibodies to myelin oligodendrocyte glycoprotein (MOG-abs) had opened a new era of differentiating acquired demyelinating syndrome (ADS). Hennes *et al* conducted a prospective multicentre observational study with 24 months of follow-up to investigate the clinical course, MOG-abs, aquaporin-4 (AQP4)-abs, MRI, cerebrospinal fluid (CSF) cells and oligoclonal bands (OCB) in paediatric ADS. Of the 210 children with ADS, MOG-abs were found in acute disseminated encephalomyelitis (ADEM) (57%), followed by neuromyelitis optica spectrum disorder (NMOSD) (25%), clinically isolated syndrome (CIS) (25%), and multiple sclerosis (MS) (8%). At 24-month follow-up, 35 children developed recurrent non-MS episodes, with 63% MOG-abs and 17% AQP4-abs at onset. If we up-titrated the cut-off of MOG-abs titre to $\geq 1:1280$ to predict a non-MS course, a specificity of 100% was obtained with the trade of lower sensitivity (47%). For a recurrent non-MS course, this criterion yielded a sensitivity of 46% and a specificity of 86%. In addition, two subgroups emerge according to different trends of MOG-abs. Paediatric ADS with a monophasic disease may have transient MOG-abs which decline within months. On the other hand, high and persisting MOG-abs are associated with a recurrent disease course other than MS. Accordingly, following the titres of MOG-abs may help to differentiate

the monophasic disease from recurrent non-MS episodes in paediatric ADS.

Hui-Chen Cheng

Multifocal visual evoked potential in compressive optic neuropathy

Sousa RM, Oyamada MK, Cunha LP, Monteiro MLR. Multifocal Visual Evoked Potential in Eyes With Temporal Hemianopia From Chiasmal Compression: Correlation With Standard Automated Perimetry and OCT Findings. *Invest Ophthalmol Vis Sci* 2017;58:4436–4449.

Multifocal visual evoked potential (mfVEP) was recorded using checkboard screens in 60 cortically scaled sectors, with 16 alternating square checks in each sector though a pseudorandom m-sequence. Sousa *et al.* enrolled 27 eyes with temporal visual field (VF) defects resulted from chiasmal compression to evaluate the performance of mfVEP in differentiating VF defects. They found a significant correlation between mfVEP amplitudes and temporal VF loss, also the corresponding macular and retinal nerve fibre layer thickness on optical coherence tomography (OCT). Multifocal VEP has also been applied in patients with glaucoma, ischemic optic neuropathy, and optic neuritis in other studies. After knowing the good agreement between mfVEP, VF, and OCT in these “standard cases”, we expect that future studies can inspire us the temporal relationship of dysfunction recorded by these three techniques in disease progression.

Hui-Chen Cheng

Entopic phenomena: “mouches dormantes”

Burggraaff MC, de Vries-Knoppert WAEJ, Petzold A. Prefoveal floaters as a differential diagnosis to optic neuritis: “mouches dormantes”. *Acta Neurol Belg* 2017; 117:703–705.

The authors present a new optical coherence tomography (OCT) observation in a case series of patients with central scotomas suspected for optic neuritis. The central scotomas in this series were associated with asymmetric visual evoked potential (VEP) latency, photopsia, ocular pain, progressive visual decline, and visual field defects, thereby raising suspicion for optic neuritis. The macular volume OCT revealed tiny prefoveal floaters

responsible for central scotomas and this phenomenon has been named as “mouches dormantes”. In patients with central scotomas and concomitant comorbidities causing ocular pain, photopsias, and asymmetric VEP latency, the suspicion of optic neuritis could be ruled out by the macular volume OCT revealing prefoveal floaters.

Rauan Kaiyrzhanov

Exploring the optic canal

Liugan M, Xu Z, Zhang M. Reduced Free Communication of the Subarachnoid Space Within the Optic Canal in the Human. *Am J Ophthalmol* 2017;179:25–31.

In this cadaveric study, the authors used epoxy sheet plastination, a modern technique of tissue preservation, to study fibrous components within the optic canal in order to assess continuity of the subarachnoid space (SAS) between the intracranial cavity and the optic nerve sheath (ONS). Epoxy sheet plastination technique involves replacement of tissue lipids and fibrous tissue with a transparent resin through a several days process of tissue freezing, dehydration and degreasing in acetone followed by impregnation with an epoxy resin mixture. This novel technique allows in situ position tissue preservation, that is particularly important when studying anatomy of soft tissues within a bony compartment, and enables examination of treated tissues both macroscopically and microscopically. In addition, it renders collagen fibres, elastin fibres, and neurofilaments endogenously autofluorescent, so that they can be assessed by a confocal microscope.

Nine cadavers who never had any history of optic nerve disease and were bequeathed for medical education and research purposes were included in this study. They were 6 females and 3 males, 8 White and one Asian, age ranged from 54 to 87 with a mean of 74 years. Nine sets of sections of plastinated cadavers were prepared, transverse (5 sets), coronal (1 set), and sagittal (3 sets) with further sectioning into 0.3-mm-thick sections with an interval of 0.8mm and staining with haematoxylin/eosin. Prepared sections were then examined under a Leica MZ8 stereoscope and a confocal microscope (Zeiss, Jena, Germany). The authors noted that the pia and arachnoid maters merged within the optic canal, and that a dense

trabecular mesh network and strong fibrous septa existed mainly in the orbital part of the optic canal, reducing free communication of SAS across the optic canal.

Free communication of SAS between the intracranial space and the ONS was described by Tenon in 1806. This observation was confirmed in studies of different animals. However, few studies provided direct evidence of such free communication in humans and the majority proposed that SAS is compartmented in the ONS because of the presence of a capillary meshed trabecular network around the optic nerve in the optic canal. Based on the findings of this study, authors concluded that in humans, free communication of the SAS between the intracranial cavity and ONS was significantly reduced.

Omar Solyman & Peter MacIntosh

Long-term evolution of superficial optic disc drusen

Malmqvist L, Lund-Andersen H, Hamann S. Long-term evolution of superficial optic disc drusen. *Acta Ophthalmol* 2017;95(4):352–356.

The Danish authors report the changes in visual field and superficial optic disc anatomy in 8 cases of hereditary optic disc drusen (ODD) over a median of 56 years of follow up. Median age of the patients at first examination was 16 years (range 13–22 years). The eight patients were previously examined and diagnosed by another ophthalmologist (Dr. Lorentzen) in 1958–1959 and published by him in 1966. The authors confirmed the diagnosis of ODD in all 8 patients using spectral domain OCT and compared their old Goldman visual field (GVF) charts and fundus photos to their recent records but not all of the eight patients had fundus photographs and visual fields available for comparison.

ADOBE PHOTOSHOP CC, version 16.0; Adobe Systems Software Ireland Ltd was used to digitally compare GVF areas of seven eyes of four patients and showed a trend towards progression in visual field defects from the initial and follow-up examinations ($p = 0.87$). Six of seven eyes had an overall decrease of 45% in GVF area using small size stimuli (size 1) and five of six eyes had an overall decrease in the visual field of 27% GVF area using large size stimuli. Even though retinal

sensitivity cannot be translated directly into visual field loss, only a decrease of 11.9% in retinal sensitivity because of age would be expected in 56 years of follow-up, the authors commented.

Anonymised initial and follow up funduscopy pictures were also compared for changes in optic disc morphology by two experienced ophthalmologists. A minimal or non-existing progression in number and volume of visible ODD was observed and the difference in the median arterio-venous ratio was not statistically significant between the initial funduscopy photos and those taken 56 years later and there was no correlation found between funduscopy visible ODD morphology and degree of visual field constriction.

Based on the results and other similar studies and reports in the literature, the authors suggested that there is a transition phase in the evolution of ODD, usually during puberty, that involves a rapidly progressing ODD anatomy and visual field defects. Later in life, the progression in visual fields and in size and number of ODD seems to decrease.

Omar Solyman & Peter MacIntosh

Treatment of visuospatial neglect

van der Kemp J, Dorresteyn M, Ten Brink AF, Nijboer TCW, Visser-Meily JMA. Pharmacological Treatment of Visuospatial neglect: A systematic review. *Journal of Stroke and Cerebrovascular Diseases* 2017;26(4):686–700.

This article reviewed pharmacologic treatments for post-stroke visuospatial neglect in adults. Eleven studies were reviewed, most of low quality in the authors' opinion. Of these, seven investigated dopaminergic therapy, but only one of these was even of moderate quality, though it did show a positive effect on visuospatial neglect. Three studies explored cholinergic therapy. Two of these were at least moderate quality, and all three showed there was benefit of cholinergic therapy on spatial attention and functional measurements. The authors noted that there was a recent Cochrane review on this topic, but fewer studies were evaluated. Cholinergic studies in general therefore were superior to dopaminergic and noradrenergic treatment, but the authors

admit that none of the studies showed a dramatic improvement of visual spatial neglect post-stroke, and further pharmacological studies, especially with comparison arms, would improve our understanding of this stroke sequela.

John Pula

Two cases of Behr syndrome associated with recessive mutations in OPA1

Rubegni A, Pisano T, Bacci G, Tessa A, Battini R, Procopio E, Giglio S, Pasquariello R, Santorelli FM, Guerrini R, Nesti C. Leigh-like Neuroimaging Features Associated with New Biallelic Mutations in OPA1. *Eur J Paediatr Neurol* 2017; 21(4): 671–677.

The authors report two cases: an 11-year old girl and a 7-year old boy, both exhibiting from early infancy: cognitive delay, ataxia and peripheral sensorimotor neuropathy, myopathy, plus moderate and severe optic atrophy, respectively (Behr syndrome). MRI showed cerebellar atrophy, basal ganglia signal anomalies and peaks of lactate (Leigh-like neuroimaging features). Initially using next generation sequencing, convincing biallelic new mutations (homozygous and compound heterozygous, respectively) were found and showed to be pathological. Recessive mutations in OPA1 therefore can cause severe, early onset phenotype of Behr syndrome.

Matthieu Robert

Enlargement of the posterior optic nerve in morning optic disc anomaly

Thoma D, Nijs I, Demareel P, Casteels I. Morning Glory Disc Anomaly with an Ipsilateral Enlargement of the Optic Nerve Pathways. *Eur J Paediatr Neurol* 2017; 21(5): 787–791.

The authors report three further cases of morning glory disc anomaly associated with thickening of the ipsilateral optic nerve in its intracranial portion. Such association had already been reported twice and it had been suggested that the optic nerve enlargement was the result of an optic nerve glioma. Here none of the reported cases had any sign of neurofibromatosis type 1 and the thickening was stable

over time; the reason for this association so far remains a mystery.

Matthieu Robert

Third nerve palsy in Olmsted County

Fang C, Leavitt JA, Hodge DO, Holmes JM, Mohny BG, Chen JJ. Incidence and Etiologies of Acquired Third Nerve Palsy Using a Population-Based Method. *JAMA Ophthalmol* 2017;135(1):23–28.

This retrospective population-based study of all newly diagnosed cases of acquired third nerve palsy from 1st January 1978, through 31 December 2014, in Olmsted County, Minnesota identified 145 cases. The most common causes of acquired third nerve palsy were presumed microvascular (42%), trauma (12%), compression from neoplasm (11%), post-neurosurgery (10%), and compression from aneurysm (6%). Ten patients (17%) with microvascular third nerve palsies had pupil involvement, while pupil involvement was seen in 16 patients (64%) with compressive third nerve palsies. This population-based cohort demonstrated a higher incidence of presumed microvascular third nerve palsies and a lower incidence of aneurysmal compression than previously reported in non-population-based studies. A limitation of the study is that Olmsted County has primarily a white population and, therefore, the results are best extrapolated to other white United States populations. There has also been an evolution of neuroimaging over the course of the study. The authors concluded that compressive lesions had a higher likelihood of pupil involvement. They noted that pupil involvement did not exclude microvascular third nerve palsy and lack of pupil involvement did not rule out compressive third nerve palsy. They also recommended neuroimaging for all acquired third nerve palsies without obvious known cause, such as an expected complication from a neurosurgical procedure.

Michael S. Vaphiades

Autoimmune retinopathy and rituximab

Davoudi S, Ebrahimiadib N, Yasa C, Sevgi DD, Roohipoor R, Papavasiliou E, Comander J, Sobrin L. Outcomes in Autoimmune Retinopathy Patients Treated With Rituximab. *Am J Ophthalmol* 2017;180:124–132.

In this retrospective, interventional case series, the authors reviewed 16 autoimmune retinopathy (AIR) patients treated with a loading and maintenance dose schedule of intravenous rituximab. Visual acuity (VA), electroretinography (ERG), and spectral-domain optical coherence tomography (SDOCT), and visual field (VF) results were recorded. A subset of patients was also imaged using adaptive optics scanning laser ophthalmoscopy (AO-SLO). The rate of visual decline was significantly less after rituximab initiation compared with the rate of visual decline prior to rituximab initiation. Seventy-seven per cent of eyes had stable or improved VA 6 months after rituximab initiation. Amplitudes and implicit times on ERG, mean deviation on VF, central subfield mean thickness, and total macular volume did not decrease to a significant degree over the rituximab treatment period. Six eyes had serial AO-SLO imaging. Cone densities did not change significantly over the treatment period. Studies with additional patients and longer follow-up periods are needed to further explore the utility of rituximab in the management of AIR. Study limitations include the retrospective nature of the study, variable length of follow-up (at least 6 months for all patients however), and the fact that patients were treated at different stages of the disease. This study adds further evidence that rituximab is an effective therapy for an inherently difficult subset of diseases to treat.

Michael S. Vaphiades

Fluoroquinolones and pseudotumor cerebri

Sodhi M, Sheldon CA, Carleton B, Etminan M. Oral fluoroquinolones and risk of secondary pseudotumor cerebri syndrome: Nested case-control study. *Neurology* 2017;89(8):792–795.

The object of this study was to quantify the risk of secondary pseudotumor cerebri syndrome (PTCS) with fluoroquinolones. The authors performed a case-control study of 339 cases people age 15–60 years with pseudotumor cerebri syndrome (PTCS). For each case, 10 controls were selected. Current users of fluoroquinolones received a prescription within 15 days or 30 days of the date of the diagnosis. Although this adverse event is rare, this study

suggests an increase in the risk of PTCS with current users of fluoroquinolones.

Michael S. Vaphiades

Retinal changes after optic neuritis

Andersen MR, Roar M, Sejbaek T, Illes Z, Grauslund J. Long-term structural retinal changes in patients with optic neuritis related to multiple sclerosis. *Clin Ophthalmol* 2017;11:1519–1525.

This was a cross-sectional study of 82 patients diagnosed with multiple sclerosis (MS), 23 of which had a history of optic neuritis (ON), were examined clinically and with optical coherence tomography (OCT). Twenty patients had at least one episode of unilateral optic neuritis and were able to identify which eye had been affected. The study results showed no differences between the two eyes regarding visual acuity, Ishihara colour test, intraocular pressure, and retinal nerve fibre layer (RNFL) in superior, temporal, and nasal quadrant. In an unadjusted logistic regression model, lower inferior, temporal, and mean RNFL were all statistically significantly associated with a history of ON. Some limitations included that the diagnosis of ON was self-reported, and even if the authors excluded patients who were not able to give a positive history, the study was still limited by the retrospective design and potential recall bias. The authors demonstrated long-term structural changes in MS patients with a history of ON. Even though patients with ON, in general, did not have any functional loss of vision, it still was possible to demonstrate RNFL thinning with OCT.

Michael S. Vaphiades

Pediatric pseudotumor cerebri

Phillips PH, Sheldon CA. Pediatric Pseudotumor Cerebri Syndrome. *J Neuroophthalmol* 2017 Sep;37 Suppl 1:S33–S40.

This review article address recent findings regarding demographics, diagnosis, and treatment of paediatric pseudotumor cerebri syndrome (PTCS). Prepubertal children with primary PTCS have an equal sex distribution and less frequent obesity compared with adult patients. However, female gender and obesity are risk factors for primary PTCS in postpubertal children.

Compared with adults, children with PTCS more frequently present with ocular motility deficits and more often have associated medical conditions that increase the risk of developing PTCS. Visual field testing may be unreliable, and the optimal modality to monitor visual function is unknown. MRI shows signs of elevated intracranial pressure (ICP) in children with PTCS similar to that of adults. Elevated ICP in children ≤ 18 years old is greater than 25 cm H₂O in nonobese, nonsedated children, and greater than 28 cm H₂O in the remainder. Optical coherence tomography (OCT) may be used to distinguish pseudopapilledema from papilledema, monitor response to treatment in preverbal children, and identify patients with PTCS at risk for permanent visual loss. However, the precise role of OCT in the management of paediatric PTCS remains to be determined.

Michael S. Vaphiades

For vision's sake, do not gain weight after IIH diagnosis!

Chagot C, Blonski M, Machu JL, Bracard S, Lacour JC, Richard S. Idiopathic Intracranial Hypertension: Prognostic Factors and Multidisciplinary Management. *J Obes* 2017;2017:5348928.

This retrospective study looked at prognostic factors for visual outcome in idiopathic intracranial hypertension (IIH). Chagot and colleagues reviewed case notes of patients with IIH under their care from January 2001 to December 2016. The researchers looked at factors leading to poor visual outcome at 6 months, defined as persistence or worsening of papilloedema and/or visual fields.

Seventy-nine patients were included. Bilateral transverse sinus stenosis (TSS) was present in 43/58 (74%) of patients. Visual outcome was poor for 46% of patients, particularly in patients who had a 5% weight gain since diagnosis ($p < 0.001$). Bilateral TSS was also a poor prognostic marker (OR = 5.2; 95 CI: 1.24–24.9; $p = 0.024$). 11/13 patients who underwent unilateral TSS stenting at 6 months showed improvement of vision. The authors therefore advocate dietary measures for weight management as first-line treatment, and unilateral stenting was considered as a safe second-line treatment option for patients with bilateral TSS.

This is an interesting paper, though there are limitations to the study, including its retrospective nature. Outcome data was not available for 12/79 (15%) of patients. Additionally, the sample size of patients with TSS is small and therefore caution should be taken about its interpretation.

However it is worthy to note that 6 months from diagnosis, 31% of patients lost weight, 48% had no change, and 21% gained weight. This paper highlights the importance of early multidisciplinary weight management intervention for IIH patients from the time of diagnosis.

Sui Wong