SOCIETY TIDINGS

United Kingdom CSF Disorders Day 2017

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ABSTRACT

The management of patients with cerebrospinal fluid disorders requires a multi-specialty approach involving specialists in neurosurgery, neurology, neuroradiology and neuro-ophthalmology. A symposium on CSF disorders was organised by the clinical and academic teams at University Hospitals Birmingham, United Kingdom. The meeting featured a synopsis of the latest scientific research on CSF disorders. Some of the more challenging and controversial issues facing the multi-speciality team were presented and discussed. A summary of the event is provided.

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This annual symposium, on the management of patients with cerebrospinal fluid (CSF) disorders, is aimed at all members of the multi-speciality team including specialists in neurosurgery, neurology, neuroradiology and neuro-ophthalmology. The symposium was designed by Miss Susan Mollan, Consultant Neuro-ophthalmologist at University Hospitals Birmingham and Dr Alexandra Sinclair, NIHR clinician scientist fellow, Institute of Metabolism and Systems Research at University of Birmingham. The event was supported by the national charity 'IIHUK' (Figure2).

The aims of the symposium were:

- To initiate debate and discussion on a selection of the more challenging and controversial issues facing the multi-speciality team managing CSF disorders;
- To provide a synopsis of the latest scientific research.

The morning opened with the speed science symposium and showcased the work of clinicians and translational scientists.

Dr Will Scotton, Academic clinical fellow in Neurology (Birmingham), was awarded the speed science presentation prize for his research evaluating the use of intracranial pressure (ICP) lowering drugs *in vivo* (Figure 1). The study was designed on the basis that there is currently insufficient evidence on the efficacy of different pharmacological treatments to lower the ICP in Idiopathic Intracranial Hypertension (IIH). Using a validated rodent ICP model, he demonstrated that Topiramate significantly lowered ICP when administered both subcutaneously and orally. The other drugs tested, including Acetazolamide, had no significant effect. The study concluded that Topiramate is therefore more effective than Acetazolamide at lowering ICP in healthy rodents. Further research into the efficacy of Topiramate in treating IIH would be of interest.

Dr Bel Littlewood, Ophthalmology trainee (Sheffield), presented a single centre retrospective observational study to determine whether computerised tomography (CT) derived measurements of optic canal dimensions correlate with visual function in patients with IIH. The study concluded that there was no correlation between optic canal dimensions and visual function in patients with IIH and no difference in optic canal dimensions between IIH patients and controls. This suggests that, at

Figure 1. Dr Will Scotton, receiving the award for 'best presentation in the speed science symposium,' from Miss Susan Mollan.

presentation, IIH does not result in bone remodeling. The results cast doubt on previous studies which had raised the possibility that canal

dimensions may be a useful prognostic indicator in visual function in patients with IIH.

A study using DEXA scanning to assess the fat distribution in IIH, presented by Catherine Hornby, medical student (Birmingham) revealed that patients with IIH have centripetal obesity, similar to that seen in simple obesity. Weight loss correlated with loss of truncal fat mass. Further investigation into the potential pathogenic role of truncal fat mass in IIH is suggested.

Anuriti Aojula, medical student (Birmingham) presented her research on optical coherence tomography (OCT) error in papilloedema. OCT imaging is being increasingly used in clinical practice for the monitoring of papilloedema. In her cohort of patients, significantly greater OCT error in patients with IIH was noted, compared to controls and this was particularly pertinent in individuals with moderate to severe disease. She concluded that OCT scans should be systematically assessed for error and manually refined to ensure accuracy in the longitudinal monitoring of patients with IIH.

Dr Connor Westgate, PhD student (Birmingham) discussed the effects of androgens on Na^+/K^+ ATPase activity, a surrogate for CSF secretion. Utilising an *in vitro* Na^+/K^+ ATPase activity assay his research concluded that the androgen testosterone increases Na^+/K^+ ATPase activity. This suggests that testosterone could increase CSF secretion and thereby increase ICP.

Figure 2. Dr Alex Sinclair and Ms Shelly Williamson, IHHUK.

A study on the effect of lumbar puncture (LP) on headache in IIH, was presented by Dr Andreas Yiangou, academic clinical fellow in neurology (Birmingham). This concluded that the majority of IIH patients experienced some deterioration in the headache in the week following LP. Headache severity pre-LP significantly influenced the likelihood of improvement or deterioration after LP. The improvement in the headache occurred at 1 h post-LP and at 7 days but overall, the improvement was small. Headache outcomes post LP in IIH patients are useful for pre-procedure counselling and consent.

The speed science section was followed by a series of interesting presentations with useful clinical and surgical learning points. Mr Shaz Ahmed, ENT surgeon at University Hospitals Birmingham, delivered a captivating lecture on the management of CSF leaks, featuring videos from his surgical practice.

Dr Charlotte Marriott, Psychiatrist (Worcester), explained the importance of developing a basic understanding of mental health issues and specifically recognising the signs of depression in patients with CSF disorders. Using a case of co-existing IIH and depression to open her talk, she presented a practical guide on case identification, clinical risk assessment and the management of depression based on the NICE Guidelines.

This was followed by Mr Simon Shaw, Neurosurgeon, University Hospitals of North Midlands, who provided a comprehensive review of the different types of CSF shunt procedures which included potential complications. He discussed the lack of clinical guidelines on shunting procedures, however, highlighted that useful lab-based data has emerged from the Cambridge Shunt Evaluation Laboratory.

A practical guide on the management of headaches in CSF disorders was delivered by Dr Alex Sinclair. She explained that headaches have a significant impact upon quality of life in patients with IIH and that headache severity does not correlate with ICP. She highlighted some of the specific problems regarding headache management in IIH, including the lack of guidelines for IIH-related headaches, the significant impact of analgesia overuse, and some of the pitfalls of using migraine medications in IIH related to side effects such as weight gain (B-blockers and tricyclic antidepressants).

Dr Mitch Foster, neurosurgery trainee (Liverpool) discussed the wide variation in the management of Normal Pressure Hydrocephalus, the difficulties in establishing collaborative research and therefore the lack of randomised controlled trial data.

This was followed by a synopsis of the latest research in IIH, presented by Dr Alex Sinclair. This included the role of 11β -hydroxysteroid dehydrogenase type 1, a modulator of glucocorticoids, which is thought to be dysregulated in IIH; the role of the 'glymphatic pathway', that is, exchange in fluid between the CSF in the subarachnoid space and the interstitial fluid in the brain along paravascular routes; the role of obesity in IIH.

The keynote speaker, Grant Liu, Professor of Neurology and Ophthalmology, University of Pennsylvania ([Figure 3](#)) presented a very comprehensive summary of nomenclature and diagnostic criteria in pseudotumour cerebri based on the revised diagnostic criteria (2013) which incorporate advances in the disease over the past decade.¹ He summarised the lecture with an entertaining and engaging clinical quiz.

The 'Case Carousel' comprised four interesting and clinically diverse cases with useful learning points presented by Dr Anita Krishnan (Liverpool), Ms Catherine McMahon (Liverpool), Miss Ruchika Batra (Birmingham) and Mr Tim Matthews (Birmingham). A panel of two highly experienced neuroradiologists, Dr Swarup Chavda and Dr Satheesh Ramalingam (both University Hospitals Birmingham) commented on the neuroimaging. The cases included a frontal brain sagging syndrome from CSF hypotension presenting with executive dysfunction and treated successfully with an epidural blood patch; a subdural hygroma following decompressive craniectomy; intracranial hypertension secondary to the vitamin A derivative all-trans-retinoic acid; intracranial hypertension complicated by an arteriovenous malformation.

The Great Debate, "This house believes that IIH in adults and children is the same disease", was chaired by Mr Conor Mallucci, (Neurosurgeon Liverpool), and featured Mr Manoj Parulekar (Birmingham Children's Hospital) who proposed the Motion, against Professor Grant Liu. Both speakers presented well-researched arguments, delivered in a most entertaining manner. The audience agreed that IIH in postpubertal children is comparable to that in

Figure 3. The keynote lecture was presented by professor grant Liu.

adults, however, in prepubertal children, IIH is a separate entity with different clinical features.

The CSF disorders day was a successful meeting, which received very positive feedback from the delegates. The next CSF day will be held on Friday 12th October, 2018 (contact the authors for more details). It will feature the speed science, more cases for the carousel, along with understanding CSF dynamics and new shunt technologies.

Declaration of Interests

The authors report no conflict of interest.

References

- [1] Friedman DI, Liu GT, Digre KB. Revised diagnostic criteria for the pseudotumour cerebri syndrome in adults and children. *Neurology*. 2013 Sep 24;81(13):1159–1165. doi:[10.1212/WNL.0b013e3182a55f17](https://doi.org/10.1212/WNL.0b013e3182a55f17).