NEUROOPHTHALMOLOGY

An Analysis of Non-Glaucomatous Optic Neuropathy in Ibadan: 7-Year Experience

Olufunmilola A. Ogun, Olusegun A. Adediran
Department of Ophthalmology, Neuroophthalmology Unit, University College Hospital, Ibadan, Nigeria. E-mail: olufunmiogun@googlemail.com

Background: The University College Hospital is the premier teaching hospital in Nigeria, serving a population of over 4 million. A pilot study conducted between September 2007 and November 2009 in the Eye Clinic, University College Hospital (UCH), Ibadan (unpublished), found that of 139 neuroophthalmology cases diagnosed during the period, 65 (46.8%) had optic neuropathy at presentation. In almost half of these, the exact etiology of the optic neuropathy could not be diagnosed.

Methods: We conducted a retrospective review of all cases of nonglaucomatous optic neuropathy (NGON) diagnosed in the Neuroophthalmology Clinic between September 2007 and June 2014, to determine the pattern of optic neuropathies presenting to the Neuroophthalmology Clinic with "Needs analysis" to determine potential areas for improvement in patient evaluation (diagnostic investigation) within the limitations of our resource-limited environment.

Results: Non-glaucomatous optic neuropathy was diagnosed in 440 cases. Records for 159 patients were found and reviewed. The age range was 6 months–87 years (Mean 39.0± 12.3 years). Male-Female ratio was 1.12:1, and the most common complaint was progressive painless vision loss over an average of 9 months. Majority, 59.3% (67/113), presented with poor acuity (vision <6/60) in the better eye. Only 3% (5 cases) presented with headache. Although, static automated perimetry (SAP) was ordered in most cases, only 35% actually performed the test. Confrontation testing was done in patients with severely visual impairment obviating SAP, and abnormalities were detected in all cases. Of the 21 cases who performed central visual field testing, defects were found in 19 (90.5%). Only 10% actually performed requested neuroimaging; mainly cranial computed tomography scanning. The most common barrier to obtaining neuroimaging was a high cost. Longest delay between the request for neuroimaging and the patient performing the test was 6 months. Some defaulted altogether. Fifteen (62.5%) of the 24 patients who obtained neuroimaging, had abnormalities. Commonest abnormality on neuroimaging was pituitary/sellar mass in 25% (6/24). Pattern of etiologies of NGON is shown in Figure 1. Major challenges identified included difficulty in obtaining recommended radiologic and serologic investigations, as well as a lack of access to genetic studies. Table 1 compares findings in similar Nigerian studies on optic neuropathy. Loss to follow-up was high (92.5%) with the majority (60.3%) defaulting after their second visit.

Discussion: Non Glaucomatous Optic Neuropathy is common in Ibadan. It is not a diagnosis in itself, and must be investigated to determine its etiology.[1] Similar to observations by Oluleye *et al*.[2] and Pedro-Egbe *et al*.,[3] determining the etiology of NGON in Nigeria is constrained by limited access to diagnostic electrophysiological, hematological, serological and genetic testing. Nutritional amblyopia[4] was suspected but not diagnosed, as there were no means of determining serum cyanide or Vitamin B levels.

Conclusion: A review of The National Health Insurance Scheme should be considered; to include support for the investigation and management of NGON with potentially treatable outcomes like compression from non-malignant brain tumors (e.g. pituitary adenoma).

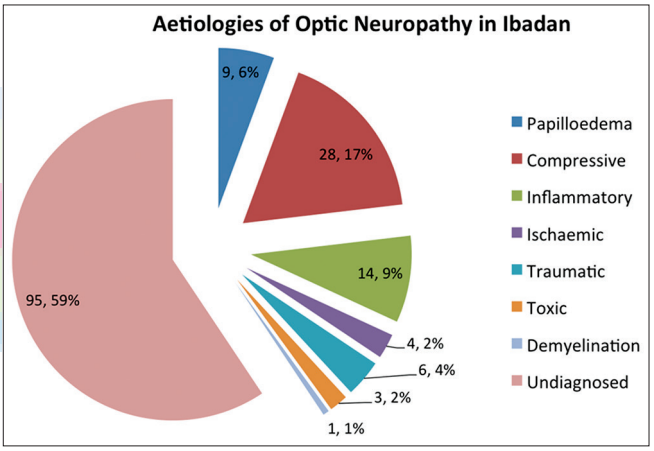

Figure 1: Pattern of Non-Glaucomatous Optic Neuropathy in Ibadan

Table 1: Comparison of results of current study with similar Nigerian studies

Author/year	Pedro-Egbe *et al.* 2011	Oluleye *et al.* 2005	OGUN and Adediran, 2014
Study location	Port Harcourt	Ibadan	Ibadan
Sample size	99	100	159
Study period	5 years	6 years	7 years
Male: Female	1.1:1	2:1	1.2:1
Mean age	40 years	40.8 years	39.2 years
Unilateral: Bilateral involvement	87.8%:22.2%	20%:80%	23.3%*:76.7% *Two unilateral cases involved the only seeing eye
Yield of Neuroimaging	Not done	Type of neuroimaging not specified, however 8% described as cranio-orbital neoplasms	Diagnostic yield of 62.5%, Cranial CT commonest imaging performed Commonest pathology: Pituitary mass
Study conclusion	Commonest cause optic atrophy 40% (undetermined aetiology)	Aetiology not determined in 62% of cases	Aetiology was not found in 59% of cases
Remarks on the comparison with index study	All cases of temporal pallor (31%) were defined as nutritional. Taking this into account, 71% were truly undiagnosed/undetermined	Findings are similar to our study. Higher proportion of undiagnosed cases may be related to lower use of neuroimaging at the time of this study	

REFERENCES

1. Lee AG. Neuro-ophthalmic afferent system diagnoses a general ophthalmologist should (Almost) never make alone. Middle East Afr J Ophthalmol 2009;16:41-5.
2. Oluleye TS, Ajaiyeoba AI, Fafowora OF, Olusanya BA. The aetiology of optic atrophy in Nigerians – a general hospital clinic study. Int J Clin Pract 2005;59:950-2.
3. Pedro-Egbe CN, Cookey SA, Awoyesuku EA, Ani N. Nonglaucomatous optic neuropathies in Port Harcourt. Clin Ophthalmol 2011;5:1447-50.
4. Osuntokun BO, Osuntokun O. Tropical amblyopia in Nigerians. Am J Ophthalmol 1971;72:708-16.

Inexpensive "Arsenal" in Your Pocket: The Mobile Phone as a Low-Tech Solution to Training, Communication and Management for Neuroophthalmologists in Nigeria

Olufunmilola A. Ogun

Department of Ophthalmology, Neuroophthalmology Unit, College of Medicine, University of Ibadan/University College Hospital, Ibadan. E-mail: olufunmiogun@gmail.com]

Background: The world is changing rapidly. Mobile technology is everywhere. There are responsible and irresponsible ways to use mobile devices. While mobile phones have increased the rates of accidents in circumstances when users endanger themselves like texting while walking, or endanger themselves and others like texting while driving, the mobile phone can be an asset to the busy clinician in more ways than previously imagined. Neuroophthalmologists are often faced with the challenges of resolving the diagnoses of clinical conundrums. Accurate documentation and follow-up of clinical symptoms and signs are essential in chronicling the progression of disease and assessing the progress of treatment. On occasion, long-range communication with experts in distant locations may be required to glean useful insight, from their wealth of experience. Faced with limited prior exposure and the looming responsibility of developing the neuroophthalmology subspecialty in Nigeria's Premier health institution, the author resorted to innovative means of self-learning, teaching and communicating in the neuroophthalmology clinic since September 2007.

Methods: Descriptive report of personal experience with the innovative use of simple mobile phones, smart phones, tablets and mobile applications that can be adapted for use by the neuroophthalmologist in Nigeria.

Results: Inventive utilization of the mobile phone from the humble 'pre-android era' mobile phone to the highly specialized smart phone with powerful and versatile apps are described along with some results of this application. Challenges facing the Nigerian Neuroophthalmologist include: Limited access to illustrative educational material, senior neuroophthalmology subspecialists and little or no training in neuroradiology. Objective documentation of subtle signs in ocular motility and pupil changes is also difficult. In addition, neuroophthalmologists must teach a relatively unpopular subject. Clinical photographs can be used to document disease presentation, response to treatment and for demonstration of clinical signs like anisocoria. Determination of abnormalities of ocular motility or ocular motor cranial neuropathy can be made from photographs of ocular rotations in the 9-cardinal positions of gaze [Figure 1]. Long distance consultations can be augmented with E-mail attachments of clinical photographs and photographs of neuroimaging, where electronic records do not exist. Finally, useful websites for personal study were identified, e.g. NeuroOphthalmology Virtual Education Library (NOVEL) http://www.novel.utah.edu/[Figure 2]. Video documentation of nystagmus was also described.

Discussion: Even in the pre-android era, the humble mobile telephone became more than just a communication device, with the incorporation of the phone camera. Introduction of software for browsing, electronic messaging and large capacity for data storage has further enhanced the mobile phone and transformed it into a versatile clinical tool.

Conclusion: The experience gained from the use of the relatively inexpensive resources at one's disposal, can help in overcoming the barriers posed by the high cost of unavailable specialized equipment, beyond the reach of the ophthalmologist in the low-income, resource challenged, developing country. Innovative use of available technology facilitates teaching of an otherwise difficult subject, leaving little to the imagination. The message is to think outside the box.

REFERENCES

1. NOVEL (NeuroOphthalmology Virtual Education Library). Available from: http://www.novel.utah.edu/[Last accessed on 2014 Jul 30]; EyeWiki (Collaborative professional website). Available from: http://www.eyewiki.aao.org/. [Last accessed on 2014 Jul 30]; University of Iowa, Healthcare, Ophthalmology and Visual Sciences Website (EyeRounds.org) EyeRounds Online Atlas of Ophthalmology, Neuro ophthalmology (category). Available from: http://www.webeye.ophth.uiowa.edu/eyeforum/atlas/indexes/Neuro-ophthalmology.html. [Last accessed on 2014 Aug 03]; Sanford University Website (Blog: Weekly Q and A). Available from: http://www.ophthalmology.stanford.edu/blog/. [Last accessed on 2014 Aug 03].
2. Haddock LJ, Kim DY, Mukai S. Simple, inexpensive technique for high-quality smartphone fundus photography in human and animal eyes. J Ophthalmol 2013;2013:518479.
3. Welch Allyn iexaminer: Hardare and Software. Available from: http://www.iexaminer.com.au/iexaminer_2.html. [Last accessed on 2014 Aug 06].