

World Optometry 2017



World Congress and Expo on

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Posters

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Optometry services in the Ashanti region of Ghana

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Statement of the Problem: Optometrists predominantly provide refractive services however the scope of practice varies depending on the curriculum for training and legislation for practice. The marked shortage of ophthalmologists in Africa means that optometrists will be important in meeting other eye care needs of the continent by providing primary eye care and diagnostic services apart from refraction. Although optometrists in Ghana are trained to deliver a wide range of eye care services including treatment of some eye conditions, it is not clear whether they are able to effectively render these services. This study sought to assess optometric services in government, Christian Health Association of Ghana (CHAG), and Non-Governmental Organisation (NGO) hospitals/clinics in the Ashanti region.

Methodology: This was a cross-sectional study. 26 government CHAG and NGO facilities including one teaching hospital were included in the study. The principal investigator visited all the facilities and administered structured questionnaires to all available optometrists.

Findings: The average age of optometrists working in these facilities was 31.6 ± 4.5 . NGO facilities were better equipped than CHAG and government facilities. Refraction, spectacle dispensing, and treatment with therapeutic drugs were available in all the facilities. 28.1% optometrists provided low vision services, and only 3.1% provided contact lens service. There was no association between the optometrist's years of practice and their level of confidence in performing the procedures except for skills in low vision assessment ($\chi^2=18.41$, $p=0.05$) and tonometry ($\chi^2=19.99$, $p=0.01$). Similarly, there was no association between facilities in which the optometrist's practiced and their level of confidence in performing the procedures except for tonometry ($\chi^2=22.05$, $p=0.04$) and biometry ($\chi^2=26.15$, $p=0.04$).

Conclusion & Significance: Although NGO facilities were better equipped compared to CHAG and government facilities, there was no difference in the ability of optometrists to perform routine procedures within these facilities.

Biography

Emmanuel Kobia-Acquah is an accomplished, Ghanaian trained Optometrist, Public Health for Eye Care Researcher, and currently Lecturer at the Kwame Nkrumah University of Science and Technology (KNUST). He graduated with a Doctor of Optometry degree in 2010 at KNUST. He had one-year comprehensive fellowship training in Clinical Optometry in 2012 at the L V Prasad Eye Institute in India and subsequently obtained an MSc in Public Health for Eye Care in 2015 from the London School of Hygiene and Tropical Medicine. He is currently undertaking a number of research work including: An image processing algorithm for prediction of glaucoma in Ghana, referral patterns of patients attending optometry clinics in Ashanti region, knowledge, attitudes, and practices on ocular health among street vendors in Kumasi. He is also involved in several community outreach programs in Ghana and is a Board Member of the Volunteer Optometric Services to Humanity (VOSH-Ghana)

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Assessment of ophthalmic drug use at Boru Hospital (BH), Dessie, North East Ethiopia

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Background: Recently in the discipline of ophthalmology, there have been many developments and introduction of new ocular therapeutic agents. In order to improve drugs therapeutic efficacy, minimize adverse effects, and delay development of resistance drug utilization trends and patients need to be evaluated periodically.

Objective: To assess the prescribing, drug use and dispensing practice of ophthalmic drugs at Boru hospital.

Methodology: Cross sectional study was conducted on patients attending outpatient department pharmacy of Boru Meda Hospital to collect their medicines. Prescriptions of 84 patients encountered were analyzed using World Health Organization (WHO) prescribing indicators and additional indices.

Result: Analysis showed that the mean number of drug per prescription was 2.2 and 97.2% of prescribed drugs were from the national essential drug list. 89.5% of drugs were prescribed by their generic name. Majority of the prescribed drugs were antibiotics (62.7%) and only 17.7% of the prescriptions had frequency of dosing. Percentage of patients with good post-dispensing knowledge on the dispensed ophthalmic drugs was 37.1%. Dispensing and counseling time were 18sec and 1.30 minute respectively.

Conclusion: The study indicated an awareness of poly pharmacy but showed ample scope for improvement in encouraging the prescriber to write complete prescription and the dispenser to provide adequate counseling.

Biography

Oumer Sada has expertise in assessing patient's drug therapy need and optimizing patient outcome by providing clinical pharmacy service. He has also additional roles in the university teaching, advising and precepting students, conducting problem solving researches and providing community service focusing on providing drug information service in promoting rational drug use.

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The application of phase-shifting technique in surface topographic measurement

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Statement of the Problem: Surface topographic measurement plays an increasingly significant role in optical measurement, such as automatic visual inspection, ultra-precision manufacturing and other fields. The latest hard drives and optical instruments require the chips with ultra-fine surfaces, as well as the corresponding detecting technique to carry out online measurement and monitor the relevant parameters. The phase-shifting interferometry is one of the most widely applied technique of which the principle is introducing time modulation into the phase difference of two beams of coherent light. By the photoelectric detector the phase can be demodulated from the interference pattern via considerable phase-unwrapping algorithms. However, the inevitable noise leads to the error and distortion of several points in the phase diagram.

Methodology & Theoretical Orientation: We propose a K-means clustering unwrapping algorithm for the error reduction. Based on "bad points" to avoid the path integral, our algorithm can complete the three-dimensional morphology online. Compared with the traditional algorithms which might result in failure to unwrap when the reference points happen to be noise points, our algorithm is put forward to extract independent noise areas, such as faults, holes, etc. and can separate the effective phase information by using the clustering analysis. The detailed algorithm is as follows: (1) Giving pixel gray difference T of each cluster center, and then calculating the clustering parameter K based on the interference pattern; (2) Considering K and the gray values g of each pixel as variables and analyzing the pixel set G in clustering process; (3) Establish the original image index matrix, generating new clustering image by replacing the original pixel values with new clustering centroids and separating independent noise area according to the distance d and weight τ and (4) Completing the unwrapping calculation.

Conclusion & Significance: We build the surface topographic experiment system and the error has been successfully made less than $0.004 \mu\text{m}$. Therefore, the K-means clustering unwrapping algorithm, of which the result is compared to that of the calibration equipment, has been valid. Consequently, the relevant online measurement can be more accurate..

Biography

Yuhe Li received his Ph.D. degree in 2001 from Tsinghua University, now he is associated professor in Tsinghua University. His main research interests include micro and Nano measurement and machine vision.

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Optic neuropathy secondary to a dolichoectatic arterial compression of the prechiasmal optic nerve

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The objective of this paper is to present an unusual case of bilateral optic atrophy secondary to a dolichoectatic arterial compression of the prechiasmal optic nerve. Optic neuropathy is a frequent cause of vision loss. Internal carotid artery dolichoectasia is rare, and can compress on the optic nerve resulting to eventual loss of vision. This is an observational case report; seen in a national eye referral center of a developing country. The patient is a 50-year old female from Albay with a history of loss of vision on the left eye. Patient was evaluated to have bilateral optic neuropathy caused by compressive effect of a dolichoectatic internal carotid artery, as revealed by magnetic resonance imaging. Optic atrophy due to dolichoectatic anomaly is uncommon, but should be considered on a patient with unexplained progressive vision loss. Clinical suspicion of this disease entity is highly warranted after more common causes of optic nerve atrophy have been excluded. MRI with MRA confirms the diagnosis for possible neurosurgical intervention.

Biography

Joy Sheril R Penilla has completed her Doctor of Medicine in San Beda College of Medicine. She is an Ophthalmology Resident in the Department of Health-East Avenue Medical center, Quezon City, Philippines.

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Spectralis optical coherence tomography normal macular thickness in Egyptians

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Purpose: The aim of this study was to determine the normative data of macular thickness in the Egyptian population and to assess the effect of different demographic data and ocular parameters on it using spectral-domain optical coherence tomography (SD-OCT).

Patients & Methods: This cross-sectional study included 105 healthy Egyptian patients, who underwent a comprehensive ophthalmic examination, including Spectralis SD-OCT scanning, at Alexandria Main University Hospital. One eye from each patient was chosen randomly to be included in the study. Macular thickness was calculated based on center thickness and nine areas that corresponded to the Early Treatment Diabetes Retinopathy Study map using OCT mapping software. The relationships between macular thickness and sex, age, axial length (AL), spherical equivalent, keratometry readings, intraocular pressure, BMI, parity, and use of oral contraceptive pills were analyzed.

Results: The study included 49 male and 56 female patients. The mean age of the patients was 40.41 ± 14.17 years. The mean central subfield thickness was 262.70 ± 19.64 μm . The mean macular thickness values in all areas of the Early Treatment Diabetes Retinopathy Study map were significantly greater in men than in women. As age increased, outer macular thickness decreased significantly in the overall group and in female, but not in male patients (partial correlation). The AL correlated negatively with inner and outer macular thickness (partial correlation). However, spherical equivalent had no significant influence on multiple linear regression analysis. Central subfield thickness did not correlate significantly with keratometry readings, intraocular pressure, BMI, parity, or use of oral contraceptive pill.

Conclusion: The mean macular thickness values in the Egyptian population were found to be less than those seen in the Spectralis SD-OCT studies published previously on Caucasians, but more than those seen in Blacks. Sex had the most significant effect on macular thickness in all regions. Age and AL showed a significant negative correlation with outer macular thickness.

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Accepted Abstracts

Efficacy of chloroquine-doxycycline combination therapy on co-infection of malaria and onchocerciasis in ahani-achi

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The clearance rates of separate and combination therapies of chloroquine and doxycycline on malaria, onchocerciasis and mixed onchocerciasis-malaria parasitemia in 603 volunteers aged 10-60+ years were investigated for baseline and post-intervention mean parasite densities (MPD) using skin snip biopsy and smear microscopy techniques between March 2012 and April 2014. Subjects were classified into onchocerciasis (n=100), onchocerciasis+ chloroquine-doxycycline therapy (n=90), malaria (n=104) and concomitant onchocerciasis-malaria (n=309) groups. Standard treatment with doxycycline was 200mg daily dose for 6 weeks while that of chloroquine was 1000mg loading dose, followed by 500mg after 6-8 hours, then 500mg each day for 2 days. Result showed that the clearance rates of chloroquine-doxycycline, chloroquine-only and doxycycline-only on concomitant onchocerciasis-malaria parasitemia were 100%, 94.12% *O. volvulus*; 52.97% MP and 100% *O. volvulus*; 97.70% MP respectively. Chloroquine was shown to potentiate the microfilaricidal action of doxycycline. Chi-square (χ^2) analysis showed that the difference between the clearance rates of combination therapy and chloroquine-only therapy on concomitant onchocerciasis-malaria parasitemia was statistically significant ($P < 0.05$) while the difference between the clearance rates of combination therapy and doxycycline-only therapy on mixed parasitemia was not statistically significant ($p > 0.05$). In conclusion, Chloroquine-doxycycline combination therapy proved effective as a novel therapeutic strategy in the management of separate and co-infection of malaria and onchocerciasis.

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The Miracle of the Scleral – Application of the mini-scleral lens in advanced keratoconus

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Today's vision sugar land, Texas

Mini-scleral rigid gas-permeable lenses have quickly become the treatment of choice by many practitioners in cases of moderate to advanced keratoconus and pellucid marginal degeneration. They are also effective in improving visual acuity in cases of reduced vision from corneal irregularities as a result of such procedures as radial keratotomy and penetrating keratoplasty. The author will present one such case. A twenty-eight year old Hispanic male presented with advanced keratoconus. He was currently wearing a scleral contact lens in the right eye only but on a very limited basis due to discomfort. He was unable to wear any lens in the left eye. Eyeglasses did not provide adequate vision. Without correction he was almost functionally blind. The patient was successfully fit with a mini-scleral Zenlens (Alden Optical) in a 17.0mm diameter. The lenses were fit empirically, as refractive and topographic data were unobtainable due to his advanced condition. He is now able to wear lenses in both eye all waking hours.

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Contact lenses in irregular cornea: What is the key?

Augusto Rosse

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For many years irregular cornea patients have been a real challenge, because soft lenses give comfort, but not good vision, therefore soft contact lenses couldn't be adapted. On the other hand rigid gas permeable contact lenses were a solution only for a little segment of those patients due the discomfort and poor corneal health. Today we are living the best moment in history of contact lenses and patient with irregular cornea are the ones with more benefits considering the whole segment of people with trouble vision. The last 8 years I have had the opportunity to attend so many patients with bad life quality, because they have dropped out theirs RGP lenses due to injuries or extreme discomfort. All the cases have been solved fitting scleral lenses and special soft contact lens in SiHy materials. My presentation is going to show the many successful cases solved, giving comfort, good visual acuity and ocular health.

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Advances in etched ion-track polymer membranes for environmental and microelectronic applications

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Etched ion-tracks membranes are well-known and commercially available membranes for filtration and, in the past decades, have attracted a huge interest for applications in life sciences. More recently, since these membranes serve as template for nanowires or nanotubes fabrication, applications in microelectronics (eg. MRAM for computers) have also been widely investigated. Control over the swift heavy-ion irradiation and subsequent etching condition enables the production of multiple or single channels of high aspect ratio. Playing on polymers chemical structure, crystallinity and track-etching strategies, channels of predefined sizes and geometries can be tuned such as cylindrical, conical or oblate-shaped channels, crossed-channels ... Track-etching technique presents the advantage to be industrially scalable. Among other examples, we will discuss how a large area fabrication of self-standing nanoporous graphene-on-PMMA substrate, interesting candidates for field-emission transistors, can simply be achieved. Ten years ago, we have shown that, after a relatively short etching time, some track-etched nanoporous polymer membranes exhibited an EPR signal witnessing the presence of remaining radicals. These radicals, results of ion-matter interactions from previous irradiation, have been found reactive enough to initiate the radiografting of vinyl monomers. The grafted polymer chains are specifically localized on and all along the nanopores walls. This discovery has opened our applications field from polymer electrolyte membranes for fuel cells to the development of sensors of pollutants in waters. In this talk, we will present our very recent achievements on etched ion-track polymer membranes for sensor applications in environment and microelectronics. The key of success is the use of a peculiar polymer, the poly(vinylidene difluoride) (PVDF). PVDF is a biocompatible and semi-crystalline polymer. Depending its crystallinity phase, it can also be piezoelectric. We will present how we have exploiting these properties for sensor applications.

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Ganglion cell function measured by ERG after IOP reduction in POAG

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This study evaluated retinal ganglion cell (RGC) function after intraocular pressure (IOP) reduction measured by pattern electroretinogram (PERG) in patients with newly diagnosed, non-treated preperimetric and early stages of primary open-angle glaucoma (POAG). Twenty-four eyes from 24 patients with POAG were included: 11 eyes with preperimetric glaucoma and 13 eyes with early glaucoma received Ganfort (bimatoprost and timolol) once a day for a period of one month. Before and after the treatment, the following measurements were analyzed: IOP, mean ocular perfusion pressure (MOPP), peak time of P50, and amplitude of P50 and N95 waves in PERG (ISCEV standard 2012). Correlations between PERG P50 and N95 waves, IOP and MOPP were calculated. After therapy, IOP significantly decreased in all eyes, on average 31%. A significant increase in MOPP in all eyes of on average 14% was detected. PERG amplitude of P50 and N95 waves increased in 75% and 79% eyes, respectively, and on average by 28% for P50 and 38% for N95. There were no significant interactions between the change of PERG parameters in time and stage of glaucoma. It can be concluded that significant IOP-lowering therapy could improve RGC function measured by PERG in patients with preperimetric and early stages of POAG.

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Implications Of 3d Printing In Ophthalmology

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Innovation and technology have major impacts on ophthalmology with future implications, particularly 3D printing. The advancements in 3D printing are transforming ophthalmology approach to business. Boroujerdi (2014) states “3D printing offers the potential for high degrees of customization, reduced costs for complex designs, and lower overhead costs for short-run parts and products” (p. 2). Understanding impacts require putting 3D printing into a contextual evaluation and understanding what 3D printing is and how it works. 3D impacts on healthcare put future influences into perspective for ophthalmology. Understanding 3D influences requires comprehension of breakthrough and disruptive technology and the potential for creative destruction. Furthermore, current uses include 3D printable contact lenses, surgical planning, patient education, and retinal imaging adapter that the FDA approved in 2013. Looking towards the future of 3D printing includes a cure for blindness, visual implants, and a functional human eye implant. Potential impacts of 3D require overcoming major challenges. Understanding the challenges and the potential for a pioneering approach to the issues points to the speed of future development.

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