General Information

The Transactions of the Ophthalmological Society of Nigeria an Official journal of the Ophthalmological Society of Nigeria publishes proceedings from the annual congress of the Society. They comprise of referenced abstracts of presentations during the congress. The scope of articles include clinical, laboratory and community medicine, basic medical sciences, medical technology, as well as the economics and management of health care delivery, especially in the African environment as they relate to the eyes. Articles are considered on the basis of subspecialty of Ophthalmology affected, including but not restricted to cornea and anterior segment, glaucoma, low vision, orbit and oculoplasty, vitreoretinal, neuro-ophthalmology, Paediatric ophthalmology, and public health ophthalmology.

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The Editorial Board is pleased to present the proceedings of the 45th Annual General Meeting and Scientific Conference of the Ophthalmological Society of Nigeria (OSN) in this sixth edition of the Transactions of the Ophthalmological Society of Nigeria. The Conference took place between the 1st and 3rd of September, 2021 at the M & M Events Centre, Ilorin, Kwara State, Nigeria.

Specialists and subspecialists in ophthalmology from within and outside Nigeria converged at Ilorin during the Conference. The meeting provided a unique opportunity for ophthalmologists at different levels of training to interact and share ideas with colleagues. The theme of the Conference was “People-centred Eye Care”. The sub themes were “Enhancing training and practice through technology” and “Vision care for the vulnerable groups”.

In line with the major objective of the Journal, this edition features peer-reviewed abstracts of the presentations that were made during the 2021 Conference of the OSN. These short articles are outputs of various research projects carried out by ophthalmologists of different sub-specialties from various public and private institutions in the country and abroad. They cut across the various subspecialties including Retina and Vitreous, Glaucoma, Paediatric Ophthalmology, Community Ophthalmology, Neuro-ophthalmology, Cornea and Anterior Segment as well as Orbit and Oculoplasty.

Also included in this edition are two full length articles, both of which are based on named lectures that were delivered during the Conference. The first full article is based on the Okechukwu lecture which was eruditely delivered by Prof. E. Babalola, while the second article is based on the President’s lecture and is authored by Prof. A.W.O. Olatinwo, a Professor of Obstetrics and Gynaecology and Immediate Past Chief Medical Director, University of Ilorin Teaching Hospital (UITH), Ilorin. The inclusion of these two articles is in furtherance of the drive of the Editorial Board to publish full length articles in addition to the refereed conference proceedings. In this regard, we solicit more full length manuscripts from members of the Society for publication in subsequent issues of the Journal.

We hope that this volume will be a significant addition to the body of knowledge generated by research conducted locally and which should translate to better methods for managing ocular conditions in our various communities. Many of the articles presented here can comfortably be used as templates for better patient management and further research in addition to being evidence for advocacy to policy makers.

The contributions of the various individuals and groups that worked tirelessly in making this issue a reality are well appreciated. Notable amongst them are the OSN executive council, the NJO crew, the representatives of subspecialties on the Editorial board, our publishing consultant and the authors, who have also been charged a minimal publication fee to partly offset the high cost of publication.

Thank you.

Editorial Team
The Role of Ivermectin in the Management of Covid 19
[SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2)]

Olufemi Emmanuel Dokun-Babalola - Professor of Ophthalmology/Epidemiology,
Bingham University, New Karu, Abuja, Nigeria

Protocols:
• The Chairman of this occasion.
• The President OSN, Dr. Bade Ogundipe
• Members of the Executive of OSN
• My colleagues/Seniors in the OSN
• Members of the Theodor Okechukwu
  Family
• Other invited Guests
• Ladies and Gentlemen.

I would like to thank the President and Council of the Ophthalmological Society of Nigeria (OSN) and indeed the Local organizing committee of the Ophthalmological Society of Nigeria Ilorin 2021 meeting, for inviting me to give this year’s Okechukwu memorial lecture. I was indeed a bit baffled when Professor Dupe Popoola called me up on the phone to discuss this. I reminded her that, in the year 2017, not too long ago, I had been invited to deliver the President’s lecture at the OSN which held in Kaduna. But she pointed out, rather correctly, that the tone and intent of the Okechukwu lecture differed from that of the President’s lecture. I am not sure if any other person in the annals of our society has had the privilege of delivering both lectures. If indeed I am the first to do so, as I suspect, I must ask myself why I have been so humbled! It is indeed a spectacular honour to have been given this double assignment, particularly when I consider the greats who are my seniors, such as Professors Olurin, Majekodunmi, Abiose, Oshuntokun and Hannah Faal, to mention but a few. My special thanks to the society know no bounds.

The giant of a man after whom this lecture is named, the late Doctor Theodore Luckson Cyril Okechukwu, (1925-1996) is a man of many firsts.

1. First son of Chief Okechukwu of Ukpor, in the present Anambra state
2. First Class honours in Botany and Zoology, National University of Ireland
3. First University Graduate from Ukpor
4. First Medical Doctor from Ukpor
5. One of the first three to qualify as Eye surgeon in Nigeria
6. Set up First Eye Clinic in Eastern Nigeria and the South Cameroons
7. First Mobile eye Clinic programme in the then East Central State of Nigeria.
I did not have the good fortune or privilege to meet Dr. Okechukwu, but when a recurrent lecture was named for him, I took pains to find out about the enormous contribution he made, not only to Nigerian ophthalmology, to Nigerian medicine, and indeed to Nigerian National development as a whole. This is a man that those of us coming behind should continually emulate.

I also congratulate the LOC on the theme of this conference: Patient Centered Eye Care. Dr. Okechukwu in his lifetime, demonstrated that the welfare of the patient was always his first consideration, even though this appeared to have cost him his health by the year 1993. We are reminded as ophthalmologists, that our patients are not ‘eyes’ or ‘cataracts’, but human beings with feelings, aspirations and emotions.

Perhaps this holistic approach to patient care may have informed my choice of this topic today: “The role of Ivermectin in the management of Covid-19”. As you may have observed, I am an ophthalmologist by specialization. So, what business do I have with such a topic? The common denominator between Covid 19 and eye care is of course Ivermectin. Together with Professor Abiose, the late Professor Barry Jones, Dr. Ian Murdoch and Prof Simon Cousens of the London School of Hygiene and Tropical Medicine (LSHTM), we had worked on Ivermectin as a safe and effective microfilaricide for River-blindness from the late eighties (Abiose et al). As a matter of fact, Dr. Murdoch’s wife Michelle, still publishes actively on river blindness, having been dragged into that line of research by her husband. She is, of course, a consultant dermatologist; and as we all know, Onchocerciasis has both ophthalmic and dermatological manifestations.

Therefore, when the SARS Cov-2 epidemic broke out in the late months of 2019, the world was scrambling for a cure or vaccine as is usual. It was my friend, Mr. Iro Nuhu, now based in Kaduna, who was our logistics chief on the Ivermectin trials, who had drawn my attention to the fact that Caly et al in Australia had discovered a five-thousand-fold reduction in viral load of Covid 19 in vitro when exposed to Ivermectin after 48 hours. I was naturally very excited about this, and we thought it would be a wonderful idea to try out ivermectin in patients with Covid 19. Our first obstacle was to see if we could raise money for such an undertaking. So, we had the idea to write to the Presidential Task Force (PTF) on Covid 19 led by the Secretary to Government Mr. Boss Mustapha. I also started discussing the possibility of doing the project with my classmate in Medical School, Professor Chris Bode, the Chief Medical Director (CMD) of Lagos University Teaching Hospital (LUTH) as to whether we could use their isolation unit as our base for the trial. In addition, I got in touch with another classmate of mine, Prof Ade Ajayi, an adjunct Professor in Baylor College of Medicine, Houston Texas, on doing a good design for a Randomised Controlled clinical trial. Needless to say, we got no reply from the PTF. But Ade knew a Special Assistant to the Vice President (VP), Prof Yemi Osinbajo, and he broached the issue of the research with him. Long story short, we were able to write a proposal for the VP, who approved for us to get funding from the Governor of Central Bank of Nigeria (CBN). Unfortunately, the CBN governor was not willing to part with money immediately, opting instead to set up a body to look into research proposals and select whichever ones were worthy of funding. And so, the CBN governor set up a scheme with a mouthful of a name called Healthcare Sector Research and Development Intervention Scheme (HSRDIS) headed by the Director General of National Agency for Food and Drug Administration and Control, Professor Mojisola Adeyeye. Laudable as that was, it meant of course that we would not be able to get funding in the near term. By the way, we got nowhere with Tertiary Education fund (TETFund), largely because they do not have a category for medical research, and I don’t think they have medically qualified reviewers for medical submissions. We also had to navigate the maze of ethical approval. We had to go through the LUTH Human Research Ethical Committee and of course the NAFDAC ethical
committee, two formidable organisations when it came to getting approvals for drug trials. The biggest hurdle we had was with the dosage we needed to treat Covid19, which was unknown at the time. In the management of Onchocerciasis, 200mcg per kilogram is given once or at most twice a year. But we knew that for Covid 19, we would have to give much more. Because, as shown by Camprubi et al³, the concentrations tested in these in-vitro assays are equivalent to more than 50-fold the normal $C_{max}$ achieved with a standard single dose of ivermectin (IVM) 200µg/kg, raising concerns about the effective dose of IVM for treating SARS-CoV-2 infection in humans and its tolerability.

So please permit me to begin the ‘technical’ side of this presentation.

I shall be undertaking this task using the following outline:
• Description of the Problem
• The Pharmacokinetics of Ivermectin
• The Ivercovid Study
• Meta-Analysis of Ivermectin Clinical Trials
• Ivermectin in Prophylaxis of Covid 19
• Controversies
• Closing Remarks

The Covid 19 Pandemic commenced in Wuhan China around December 2019, when the first cases of unexplained pneumonia were seen⁴. It is thought that the epidemic commenced in a wet market in the city, but controversy persists as to the role of a research laboratory funded by the Food and Drug Administration in Wuhan, with some people suggesting that the virus is an experimental ‘leak’ from this research facility. As of today, 215 million people have been affected worldwide, and 4.5m have unfortunately perished. A map of the countries as they are affected is shown in Figure 1, suggesting that the bulk of the epidemic has occurred in India, Europe, North and South America. China and Africa have been relatively spared of this disease.

The current situation of cases over the past 14 days situation by World health Organization (WHO) region is shown in Figure 2. By far and away, the region that is most affected is the North Americas. The current delta variant has of course led to what can be considered to be a fourth wave of infection.

If we come down to what has been happening in Africa, we will see that there has been a total of 5.6 million confirmed cases and 172,000 deaths. Largely, what is happening at the African level devolves to us in Nigeria, with 190,000 cases and 2,300 deaths. We are in the middle of a third wave in Nigeria.

It had been predicted that Africa would have to deal with bodies piled up on the streets, due to lack of infrastructure and manpower. About 5 billion doses of vaccines have been
administered but this has had little effect on incidence while it has thankfully mitigated mortality and hospitalization. This is largely due to the development of new variants such as the delta variant.

There was still a need to develop effective pharmaceutical interventions. The discovery of the invitro anti-viral effect of ivermectin spurred us to assess its in-vivo effect in Lagos. As indicated earlier, in spite of all the obstacles that we met on the road, and borrowing money from private sources, we decided to start the project after obtaining ethical approval from Lagos University Teaching Hospital Human Research Ethical Committee (LUTH HREC) and NAFDAC. We decided on the name IVERCOVID for the project, a reflection of the fact that we are studying the effect of Ivermectin on Covid 19. A team was assembled (Table 1) including the virology team in LUTH, the CMD, Chairman Medical Advisory Committee (CMAC), the infectious disease experts and internists.

The actual topic of our undertaking was “A Double Blind Randomized Clinical Trial Assessing the Efficacy and Safety of Ivermectin in Covid-19 (IVERCOVID) Study”.

<table>
<thead>
<tr>
<th>Name</th>
<th>Role in the project</th>
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<tbody>
<tr>
<td>Prof. Femi Babalola</td>
<td>Principal Investigator, Bingham University</td>
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<tr>
<td>Prof. Chris Bode</td>
<td>CMD LUTH</td>
</tr>
<tr>
<td>Prof. Lanre Adeyemo</td>
<td>CMAC LUTH</td>
</tr>
<tr>
<td>Prof. Adesuyi Ajayi</td>
<td>Clinical Pharmacologist</td>
</tr>
<tr>
<td>Prof. S.A Omilabu</td>
<td>Project virologist</td>
</tr>
<tr>
<td>Prof. Ademuyiwa AO</td>
<td>Senior Project coordinator</td>
</tr>
<tr>
<td>Dr. Olumuyiwa Salu</td>
<td>Project Virologist</td>
</tr>
<tr>
<td>Dr. Akase IE</td>
<td>Infectious diseases</td>
</tr>
<tr>
<td>Dr. Felix Alakaloko</td>
<td>Project coordinator</td>
</tr>
<tr>
<td>Dr. Erere Otrofanowei</td>
<td>Project coordinator</td>
</tr>
</tbody>
</table>

Assessing the Efficacy and Safety of Ivermectin in Covid-19 (IVERCOVID) Study

The study was carried out following the report of a 5000-fold reduction in viral load by Australian workers with in-vitro use of Ivermectin on Covid-19 in culture. I had worked extensively with Ivermectin on the onchocerciasis control program. More Nigerians have used Ivermectin than any other country in the world. Over 160 million Africans have been treated with annual or biannual doses of Ivermectin as part of the African Onchocerciasis Control Programme (APOC), and not less than one third of this population have been Nigerians. And so, it could be said that Ivermectin is “our” drug! In the western world, ivermectin is used mainly for veterinary purposes (such as in the treatment of Dog heartworm), which is one of the criticisms levelled against those who prescribe and use the drug in America. Note that it is not available over the counter in America, whereas the veterinary product is available, hence some patients use this out of desperation.

Our study was carried out in the Lagos University Teaching Hospital (Nigeria) in the isolation unit set up in that University.

About Ivermectin

It is a product of a soil dwelling bacteria called Streptomyces avermectilis. It was initially extracted from soil samples collected near a golf club in Japan in 1975. Ivermectin is an anti-parasitic drug developed during the 1970s as a partnership between the Kitasato Institute in Japan and Merck & Co. The project was led by Satoshi Omura and William Campbell on each side respectively. Satoshi Omura cultured bacteria, which produce substances that inhibit the growth of other microorganisms. In 1978, he succeeded in culturing a strain from which William Campbell purified a substance, avermectin, which in a chemically modified form, ivermectin, proved effective against river blindness and elephantiasis.

For their efforts, they won the Nobel prize in 2015 “for their discoveries concerning a novel therapy against infections caused by roundworm parasites.”

Chemical structure of Ivermectin: It is a macrocyclic lactone. A lactone is an organic compound containing an ester group —OCO— as part of a ring.

Macrocyclic lactones specifically describe chemicals derived from soil
microorganisms belonging to the genus *streptomyces*. The chemical name is C$_{48}$H$_{74}$O$_{14}$ Ivermectin B1a 70288-86-7, Dihydroavermectin B1a 22, 23-Dihydroavermectin B1a

**Medicinal Properties of Ivermectin:**

Ivermectin was discovered to have antiparasitic properties in animals, later man. It has been used to treat over 165 million Africans for onchocerciasis. (African Program for Onchocerciasis Control). In addition, it is useful for loiasis, scabies, head lice and even malaria. It is a safe drug with few side effects even in high doses. Found to have antiviral properties blocking importation of alpha particles and viral entry in Dengue fever virus, which led to in-vitro studies by Caly *et al* in Australia$^2$. Caly *et al*

discovered that it reduces SARS-Cov2 viral load in culture by 5000 times at 48hrs after incubation.

The antiviral properties of Ivermectin have become reasonably well known and they include the following:

- Ivermectin; IVM inhibits and disrupts binding of the SARS-CoV-2 S protein at the ACE-2 receptors (Figure 5).
- Inhibits viral entry into the cell nucleus by blocking imp-Alpha and Beta1 (slides 35-37).
- Interferes with RNA polymerase activity

**The Pharmacokinetics of Ivermectin:**

Ivermectin is orally absorbed with higher absorption as a solution better than tablets. It has a high volume of distribution (Vd) of about 3.1-3.5 litres/kg or about 210 litres in a 70 kg man. The standard dose being 150-200 mcg/
Kg weight. Ivermectin has 99% hepatic metabolism via CYP3A4. Only 1% is excreted in the urine unchanged. The half-life (t1/2) is 18 - 24 hours. The Mean Residence Time (MRT) is 3.4 days. This informs the suggested frequency of dosing, i.e. twice a week.

Hypothesis

• **Null hypothesis Ho:** Safe doses of Ivermectin are not useful in the treatment of patients with virology proven Covid 19 disease, does not lower viral load, and does not shorten time to negativity, neither does it cause improvement in clinical parameters when compared to Lopinavir/Ritonavir/ Placebo. (The standard of care in LUTH at the time of the study)

• **Alternative Hypothesis Ha:** Safe doses of Ivermectin are useful in the treatment of patients with virology proven Covid 19 disease, lowering viral load, shortening time to negativity, and causing improvement in clinical parameters when compared with Lopinavir/Ritonavir/Placebo.

**Study design:** The study was designed as a double-blind study involving three groups.

• Group 1 got Ivermectin 6mg twice weekly- 21
• Group 2 got Ivermectin 12mg twice weekly-21
• Group 3 Control-20 got Lopinavir/ Ritonavir.

The Main outcome measures were as follows:

1. Days to negative test result.
2. Changes in Clinical parameters (Oxygen saturation [SpO₂]).
3. Change in some selected Laboratory parameters (Liver function tests [LFT], Platelet count, Prothrombin time)
4. Serious Adverse Events

**Table 2: Mean number of days to negative test result**

<table>
<thead>
<tr>
<th>Trial Arm</th>
<th>Days to Negative Deviation (Mean)</th>
<th>Standard Range</th>
</tr>
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<tbody>
<tr>
<td>6mg twice weekly</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>12mg twice weekly</td>
<td>4.65</td>
<td>3.2</td>
</tr>
<tr>
<td>Control</td>
<td>9</td>
<td>7.3</td>
</tr>
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P=0.02

**Results**

**Effectiveness of Randomisation**

- Randomisation was effective based on distribution of age, sex and some clinical presentations at baseline such as cough and fever.
- Sixty-three cases were recruited in all
- There was one withdrawal. One set of results were unavailable for analysis
- Average number of days to negative was 6 days in the 6mg arm, 4.65 days in the 12mg arm and 9 days in the control arm. So, it is apparent that ivermectin dose-dependently reduced the number of days to negative as indicated.

This is also depicted in the box and whisker plots and the Kaplan-Meir chart (Figures 6 and 7). Hazard ratio was 0.5 (For every negative event

![Figure 6: Box plot showing days to negative result after ivermectin.](image)

(A= 6mg twice weekly for two weeks, B=12mg, C= Lopinavir+Ritonavir)
on the control arm, there are two negative events in the treatment arm).

The time sequence of testing is displayed in the RMANOVA (Repeat Measures Analysis of Variance) chart which shows a clear divergence in PCR negativity over time in the three groups (Figure 8).

It will be noticed that the 6mg arm closely approximated control in the time sequence whereas the 12mg arm was clearly superior. There is also some effect on the change of SP02 (peripheral capillary oxygen saturation) values from baseline, the ivermectin arm showing significant superiority in that area $P=0.073$. In a later study in Abuja (yet to be published) the use of ivermectin was associated with a steady increase in SP02 when compared with controls.

At the dose of ivermectin used, it seems the level of Platelet count increases by day 7 $P=0.039$. This may suggest a reversal of consumptive coagulopathy which is characteristic of the disease.

Reduction in platelet count also appears to be negatively correlated with the number of days to negative in this cohort.

Therefore, our overall results are as follows:

- Days-To-Negative (DTN) reduced by 3.8 days overall
- Confidence Interval 1.1-6.5 days
- DTN reduced by 4.5 days in 12mg arm
- A few patients are negative by day 2
- 50% are negative by day 5
- Tendency to increase in SP02
- Increase in platelet count suggestive of arrest in consumptive coagulopathy.
- No Serious Adverse Events

Our study has been incorporated into several meta-analysis. Looking at the one put together by Dr. Andrew Hill of the pharmacology department of the University of Liverpool, trials from several countries in North and South America, Europe, and Africa have been included. The trials are classified into Hospitalized (Mild, moderate and severe categories) and outpatient and then into single day dosing and multi-day dosing. They are also classified according to dose, which tended to range from 200-400mcg/kg.

The survival benefits of Ivermectin were quite clear. 35/1064 of patients on Ivermectin died (2%) versus 93/1063 (8.7%). Test for overall effect $z=3.57$ ($P=0.0004$).

Amit Patel$^5$ also carried out an observational study, in which 704 patients were assessed in the Ivermectin and non-Ivermectin arm and stratified as to the use of mechanical ventilator. This demonstrated a significant reduction in mortality in the Ivermectin arm. According to Hill et al$^6$, multiday dosing appears to subserve a survival benefit. The effect is more
certain in the blinded studies than the open label studies. Amazingly, Hill has since revised his position and concludes in a limited series that ivermectin has no effect. However this contradicts the living meta-analysis which now includes 74 studies, which strongly supports the efficacy of ivermectin.\(^7\)

A meta-analysis by Bryant et al\(^8\) looking at 15 studies also concluded that the use of ivermectin reduced the mortality from Covid 19 significantly.

In the analysis of time to viral clearance, which included our own study, time to viral clearance was reduced by about 3 days. Time to clinical recovery’ is a bit more imprecise an end-point, but ivermectin appears to reduce this by an overall \(z\) effect of 2.52, \(P=0.01\).

The likelihood of negativity by day 7 is 1.35 higher on ivermectin.

When High risk of Bias studies are removed, then reduction in days to negative is still around 3.39. \(P=0.0005\).

One of the major effects of Ivermectin is the effect on inflammatory markers. It will be recalled that runaway inflammatory cascade leads to the so-called cytokine storm, which along with thrombo-embolic phenomenon, is known as the major cause of death\(^9\). There are significant reductions in C-Reactive Protein, Ferritin and D-Dimer. This is also reflected in our study in Abuja.

Ivermectin as Prophylaxis

Is ivermectin useful as prophylaxis for Covid 19, and if so, in what doses?

In a study by Alam et al\(^10\) on exposed hospital workers, only 6% of the hospital workers on ivermectin 12mg per month were positive at the end of 4 months, versus 73% in the untreated arm.

An ecological study by Hellwig et al\(^11\) suggests that countries who routinely use ivermectin as prophylaxis for parasitic diseases, especially African countries, tended to have a lower incidence of Covid 19.

Behera et al\(^12\) also found that: Two-dose ivermectin prophylaxis at a dose of 300 \(\mu\)g/kg with a gap of 72 hours was associated with a 73% reduction of SARS-CoV-2 infection among healthcare workers for the following month. Chemoprophylaxis with ivermectin thus appears to have relevance in the containment of the pandemic.

Mass distribution of Ivermectin in cities and states.

Pierre Kory et al\(^13\) has looked at municipalities in Peru and Paraguay where Ivermectin has been distributed, and reported on the effect of this intervention. In all cases, there is an immediate reduction in reported mortality.

The graphs show clearly that there is a sharp drop in mortality when ivermectin is distributed, almost like night and day (Figure 9).

![Figure 9: Effect of ivermectin distribution in different cities across Peru](image)

It supports anecdotal evidence from prisons and nursing homes where ivermectin has been used in the treatment of other conditions like scabies.

It will be noted that recently, several states in India opted to utilize ivermectin prophylactically “against medical advice of WHO, National Institute of Health and Food and Drug Administration”, while other states opted to follow the advice of these bodies. The
experience in New Delhi is depicted in Figure 10.

In essence, states that opted to use ivermectin experienced dramatic drops in incidence, while states that toed the line of the regulatory bodies experienced explosive increases in their Covid-19 case load as in the table.

A suit was instituted by the Indian Bar association of Tamil Nadu against the WHO representative who had ‘misled’ the state into relying on dubious advice. The lawyers said Inter-alia:

- The entire world witnessed the effectiveness of Ivermectin against India’s deadly second surge as the locations that adopted it saw their outbreaks quickly extinguished in stark contrast to those states that did not.
- Among the most prominent examples include the Ivermectin areas of Delhi, Uttar Pradesh, Uttarakhand, and Goa where cases dropped 98%, 97%, 94%, and 86%, respectively. By contrast, Tamil Nadu opted out of Ivermectin. As a result, their cases skyrocketed and rose to the highest in India. Tamil Nadu deaths increased ten-fold.

Is vaccination the only answer to the Covid-19 crisis? To listen to the western media and experts, it appears as if once a proportion of the population is double vaccinated (usually they say 70%), then the epidemic should just melt away.

However, breakthrough infections after vaccinations have been reported all over the world. Although more than 60% of the adult population have completed two doses of vaccines in Seychelles, Israel, and the UK among others, they still had significant breakthrough infection rates. In Seychelles, they mostly used Sinopharm vaccine and Covishield (an Indian copy of the AstraZeneca). Things got so bad in Seychelles that they had to impose fresh lockdown. Astra Zeneca vaccine was found not to be effective against South African Variant (Now called the Beta variant) and they had to switch to other types.

The map of the USA in Figure 11 indicates vulnerability to Delta variant in spite of the impressive progress in vaccination.

In Israel over 60.3% were fully vaccinated when they decided to open up the society. But despite that, they have had a spike in infections and deaths, although the death spike is somewhat mitigated.

In Figure 12, there is a clear spike in new cases per million in the USA and in the UK. These spikes are said to be due to the Delta variant.

Total antibody levels appear to start declining from as early as six weeks after
complete vaccination and can reduce by more than 50% over 10 weeks, according to new data from University College London's Virus Watch study. For Pfizer vaccine, antibody levels reduced from a median of 7506 U/mL at 21–41 days, to 3320 U/mL at 70 or more days. For AstraZeneca, antibody levels reduced from a median of 1201 U/mL at 0–20 days to 190 U/mL (67–644) at 70 or more days. However, memory cells can play a role in mitigating severity of infection.

**American regulatory bodies**

The National Institute of Health (NIH) reviewed the evidence available as at then. They concluded as follows: “The Panel cannot draw definitive conclusions about the clinical efficacy or safety of ivermectin for the treatment of COVID-19. Results from adequately powered, well-designed, and well-conducted clinical trials are needed to provide more specific, evidence-based guidance on the role of ivermectin for the treatment of COVID-19”.

Statements from WHO and MERCK fall along similar lines.

The statement from the Food and Drug Administration (FDA) was a bit stronger: “FDA has not approved ivermectin for use in treating or preventing COVID-19 in humans”.

“Ivermectin tablets are approved at very specific doses for some parasitic worms, and there are topical (on the skin) formulations for head lice and skin conditions like rosacea. Ivermectin is not an anti-viral (a drug for treating viruses)” (The FDA) warns against the use of animal preparations in the management of Covid 19.”

However, one notes that Ivermectin is a proven antiviral drug, both in vitro and in vivo. Secondly, nobody recommends the use of animal preparations, but the statement gives the impression that the only preparations of Ivermectin available are animal preparations. In the USA, unfortunately, the human preparations are not available Over-the-Counter (OTC), but may be obtained on prescription, supposedly for other indications like roundworms, and topical preparations for scabies and head lice.

Although it has been prescribed by maverick doctors for Covid, or after court orders, the use of ivermectin has been politicised into “Republican” and “Democrat”, with the former now identified with ivermectin use.

Current management of Covid-19 by NIH is largely along the following lines:

- Mild cases are managed at home on antipyretics and analgesics
- Hospital admission only when the patient gets into distress
- (However, they are beginning to give antibody preparations for passive resistance in so-called Pop-up clinics)
- On admission give:
  - Remdesivir.
  - Anti SARS-Cov2 neutralising antibodies (Bamlanivimab)
  - Dexamethasone.
  - Supportive therapy including O2
  - Intensive Care including intubation.

There has however been a pushback from the (British Ivermectin Recommendation Development) B.I.R.D organisation in the UK, and the Frontline Covid19 Critical Care Alliance (F.L.C.C.C) organisation in the USA.

- B.I.R.D - British Ivermectin Recommendation Development
- “Partnering with worldwide clinical experts, BIRD recognises the growing...
body of research that shows that ivermectin is a safe, effective medicine we could use to combat Covid 19.

• Although ivermectin is licensed in the UK, it cannot be prescribed for Covid 19 until it receives Government approval.

• Ivermectin is readily accessible and very low cost and can effectively reach worldwide populations very quickly. Our aim is to get ivermectin approved soon in the UK and around the world. Time is critical and we know that the quicker we deploy, the more lives we can save”.

The BIRD project is led by Tess Lawrie, Director, The Evidence-Based Medicine Consultancy Ltd. BIRD approved ivermectin in March, 2021, for the prevention and treatment of COVID-19 based on 21 RCTs and 2,741 patients.

• F.L.C.C. Frontline Covid19 Critical Care Alliance
• Led by Pierre Cory, an American Critical care physician who has testified twice before the American Senate.
• On the reluctance of WHO to recommend ivermectin in the face of the evidence, the FLCC concluded, inter-alia:
  • “We could not arrive at a credible scientific rationale to explain the numerous irregular, arbitrary, and inconsistent (recommendations of WHO on Ivermectin)”
  • “We identified two major socio-political-economic forces that serve as the main barrier influences preventing ivermectin’s incorporation into public health policy in major parts of the world”.
• (1) The modern structure and function of what we will describe as “Big Science” including “Big Pharma” and;
• (2) The presence of an active “Political-Economic Disinformation Campaign.”

Ivermectin is no longer under patent of Merck, it is an ‘orphan’ drug, and nobody will make money from it, and so it is not to the liking of Big Pharma/Big government/Big research/Big university complex. Molnupiravir, which has been developed by Merck as an oral antiviral, is being pushed by Merck, who are at the forefront of the campaign to discredit ivermectin, ironically their own product.

**Overall conclusions**

• Ivermectin should be considered for adoption into the uniform treatment guidelines of Covid 19.

• Ivermectin should be used as prophylaxis pending the rollout of vaccination programs or alongside it.

• Ivermectin is not meant to replace other Covid 19 measures such as social distancing, face masking and hygiene, or vaccinations

• It is an additional tool which must be deployed to fight the pandemic.

• A report of our findings has been forwarded to NAFDAC.

The late Dr. Okechuwu was a public-spirited person who idealised the best of the profession of medicine. He was ready to serve in any capacity and wherever he was posted, be it Ibadan, Lagos, Enugu or Aba. He served humanity until his strength failed him. It is in this spirit that we must continue to fight for solutions to emergent heath problems with whatever gifts God has endowed us. We must eschew the allure of filthy lucre and seek what is best for our fellow humans.

It is with this commendation that I bring this lecture to a close.

**REFERENCES**


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“Change, Growth and Social Impact: The Triadic Nexus in Ophthalmic Care”

AWO Olatinwo, MBA FWACS

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INTRODUCTION
It gives me great pleasure to stand before you today to deliver the President’s Lecture at this year’s meeting of the Ophthalmological Society of Nigeria in Ilorin.

Ilorin is an attractive composite of different cultures and outlooks. Like the eye, these various segments with their uniqueness make the city and indeed the state a melting pot of different ethnic, religious and social groups who dwell together in the impressive harmony of an Orchestra.

Kwara state is labelled the State of Harmony because of this and other reasons, and I am sure that you have so far enjoyed the serenity of our state capital during your stay. On behalf of the Local Organising Committee (LOC), I can assure you that you will be treated sumptuously to delicious meals and to impressive first-hand experiences of the sights and sounds of this great city.

The delivery of a prestigious lecture such as this presents an excellent opportunity to translate the theory of what we know into a practical demonstration of innovation and positive transformation. The platform offered by this lecture transcends in influences the four walls of this room. That this lecture attracts some of the brightest and intellectually influential minds in our country every year is an assurance that whatever message that resonates from this rostrum will be carried far and wide with massive potential for effective implementation. This year, the COVID-19 pandemic imposes the burden of organizing an additional online audience for every physical conference. Again, this becomes an advantage, and the echoes of this lecture will travel far beyond society’s expectation.

Before I start, I want to thank the President and executives of the OSN for this invitation. When I got the invitation from Prof Dupe Ademola-Popoola, I was intrigued, not only because the invitation promised a brilliant and engaging audience, but also because the invitation re-echoed one of the fundamental values of our profession- which is the BROTHERHOOD and how intertwined we are. As you were told in the citation read, I am a Professor of Obstetrics and Gynaecology and a Health Management consultant. On a lighter note, you may not appreciate it. Still, there is a
considerable similarity between what I do and what you do as Ophthalmologists. Forget about the fact that we both work at different ends of the human body. You must agree that we both dilate specific body structures, reach for the fundus (in one way or the other), and when all is said and done, we both deliver something—while I deliver a baby, you deliver a cataract!

Mr. Chairman, distinguished colleagues, the theme/subtheme of this conference, “people-centered eye care” and “vision for the vulnerable groups,” resonates with me and has inspired the topic of my ADDRESS which I have titled “Change, Growth and Social Impact: The Triadic Nexus in Ophthalmic Care.”

A pertinent question to ask at this stage is, “How can we be sure we find happiness in our careers”?

The answer to this is from Frederick Herzberg’s research work. He asserts that the powerful motivator in our lives isn’t money; it’s the opportunity to learn, grow in responsibilities, contribute to others, and be recognized for achievements. In other words, social capital has a far greater reach and impact than financial capital.

Distinguished ladies and gentlemen, very few specialties of Medicine present the startling opportunities Ophthalmology gives to achieve rapid impact on large numbers of people simultaneously. An Obstetrician may not have the opportunity to perform 30 caesarean sections daily putting smiles on 30 maternal faces. Still, I am aware that a single Ophthalmologist can perform 30, maybe even 40 cataract surgeries in a day! What potential for impact! Of course, no one knows better than the people in this room how much joy that can bring to a hitherto visually impaired person. The Commonwealth Health and Education Policy Brief 2017 estimates that 4 in 5 visually impaired people can have their vision restored with 95% success by cataract surgery or eyeglasses.

Ophthalmology has an immense potential to rapidly and radically transform lives and limit human suffering that we must understand critically, defend, strengthen and even escalate to other aspects of our national life.

The Lancet Global Health Commission states that of the 7.79 billion people living in the world in 2020, 43.3 million were blind with presenting visual acuity of worse than 3/60 in the better eye. Like most life’s problems, this problem affects humanity disproportionately: 55% or 23.88 million of this figure are women. Recall that women rank lower in most of life’s socio-economic indices. Concerning ophthalmic well-being, they are also a disadvantaged group, a group to be helped. Therefore, I hope that this address will charge and motivate you as individuals and as a group to turn the science of Ophthalmology which is your vocation, into the art of helping others and adding to the overall pool of human happiness and liberation from disability.

It is often said that next to the gift of light is the gift of sight. The relationship of eyesight to quality of life has been proven repeatedly. It has been established that good eyesight is critical to achieving the Sustainable Development Goals (SDGs). Eyesight is directly related to human success. It correlates with productivity in the workplace, household income, employment rate, economic productivity, and so on. The eye, the only organ that is a direct peripheral extension of the brain, possesses the power of joy and sorrow, life and health, pleasure and anger, grace and beauty. Small wonder Yogananda notes poetically:

“Let my soul smile through my heart
And my heart smile through my eyes
That I may scatter rich smiles in sad hearts”

Distinguished ladies and gentlemen, I have been privileged to take a journey through the world of Vision- its loss and its gain through the God-given opportunity I had of being the CMD of UIITH for 8 years. Through positive reinforcement and indirect suggestions,
influenced the behavior and decision-making of individuals and the hospital community. I will share my thoughts on how we can turn Ophthalmic care into a tool for helping others, helping our people, and creating unforgettable memories that we will be remembered for so that we can continue to live in the hearts of others.

1. Creating a strategy

In order to create a strategy for Change, Growth, and Social Impact, you must: “Understand the magnitude of the problem, understand the resources you have”.

According to the Commonwealth Health and Education Policy Document, 95 million commonwealth citizens live with some form of visual impairment, 13 million blind and 82 million visually impaired. 80% of these cases are avoidable, and 60% are women. These statistics leave our work well-cut out with poignant implications. One is that preventive ophthalmology must take pre-eminence and mass community-based evaluations, outreaches and interventions would be crucial to helping our people beat the scourge of visual loss. To this extent, UITH supported the Community Ophthalmology Unit of the Department of Ophthalmology, and this unit has a strong legacy of service. The Head of the Unit, Prof FG Adepoju, won a Novartis Global award recently.

2. Allocating Resources

“Recognize the hidden advantages in every opportunity and be ready to Manage change effectively”.

To support a people-centred ophthalmology intervention, the first confounding actor after quality personnel is finance. In 2010, shortly after I assumed duty as CMD, the UITH completed its relocation from the old site to its permanent site. This movement was tasking and caused a lot of dislocation. Some staff were reluctant to move because the new hospital was farther away from the heart of the city and had an inadequate access road. However, as a change agent, I knew we had to move. The old site was small and expanding the hospital and building new infrastructure was difficult. We, however, managed this change effectively, and one of the advantages of our new site was that we could conceptualize and commence the construction of an ultramodern eye centre complete with wards, clinics, and theatre suites. My successor commissioned this centre earlier this year (Figure 1). It is modelled after the LV Prasad Eye Institute in Hyderabad, India. Mr. Chairman, ladies and gentlemen, permit me to echo the words of John Maxwell here: “Change is inevitable, but growth is optional”. We must always seek to use every opportunity of change to achieve growth and translate growth into development.

3. Creating a Transformational Culture

“Partnerships are important”

Shortly after we assumed office, the Ophthalmology Department came up with a proposal to invite the ORBIS Flying Eye Hospital to UITH. The programme was held in February/March 2011 and was an excellent avenue for human resource development for all cadres of staff in the department and outside the hospital.

Several local and national ophthalmologists, nurses, anesthetists, biomedical engineers and technicians were
trained through the programme. The capacity built during the programme through various lectures, seminars, patient interactions, hands-on surgical training, and skills transfers greatly enhanced the skills of all the personnel involved. We were also involved in the Kwara Eye Care Programme supported by Sight Savers International.

Partnerships among ourselves must be vigorously pursued to develop people-centred ophthalmology services. With a blossoming private eye care sector in our nation now symbolized by high-profile centres like Eye Foundation, Mecure Eye Care and the likes, I want to challenge the OSN to find ways of building bridges of mutual benefit between the private sector establishments which may have more equipment and the public sector hospitals which may have more personnel.

4. Human Resource Development

“Doing deals doesn’t yield the deep rewards that come from building up people”.

Like most other specialties, Ophthalmology is a multi-professional specialty. The success of people-oriented services will depend on effective teamwork, which rests partly on well-trained team members. In order to strengthen our staff to render effective service, we improved our training allocation to the Department of Ophthalmology, and commenced subspecialty training in paediatric ophthalmology, medical retinal, and oculoplasty. We supported the Pediatric Ophthalmology Unit of the Department to receive the accreditation of the Nigerian Pediatric Ophthalmology and Strabismus Society to conduct 1-year fellowship training in pediatric ophthalmology, and at least 2 pediatric ophthalmologists have been successfully trained. We established the School of Ophthalmic Nursing for the nurses, one of the few in the country. Several of our staff also received training outside the country, especially in India and the USA.

5. Avoiding the “Marginal Costs” Mistake

“A strong leadership is crucial”

To deliver People-centered eye care, it is important to identify and push for solid sector leadership. Leadership is a crucial element that will determine the success of any venture. It is the seemingly intangible component that guarantees tangible results. I like how John Maxwell, the world-renowned leadership expert, described leadership as not about titles, positions, or flowcharts but about one life influencing another. The positive influence on people’s lives, the direct impact that changes their station in life for the better, defines leadership, not just the mere occupation of a high office. Good leadership is also about taking responsibility. Accept the blame when things go wrong and praise when success is achieved. I know we have a mixed audience from different backgrounds here. Still, one of the crises of leadership plaguing the health sector today is related to the struggle for headship without commensurate readiness to accept responsibility. I want to charge you colleagues to strengthen your leadership position in the eye care delivery sector. Every member of OSN who has the opportunity of occupying any strategic office should see such an opportunity as being held in trust for the larger cause of serving mankind.

Effective leadership requires a strong personality and people management skills that make others want to follow the leader’s direction.” (Pierre-André de Chalendar). This simply enunciates the importance of emotional intelligence in leadership. Emotional intelligence in leadership is a composite of soft skills comprising empathy, social skills, self-awareness, self-regulation, and motivation. These are qualities that make effective leaders and which make them able to create connected and motivated teams. This is inevitable if we are to help others and create milestones that we will be remembered positively for.
The lesson I learned from leadership and immediate gains is that it’s easier to hold to your principles 100% of the time than to hold to them 98% of the time. You should avoid the temptation of “just this once” based on a marginal cost analysis. You’ve got to define for yourself what you stand for and draw the line in a safe place.

I must make a personal observation at this juncture. Though a surgical specialty, Ophthalmology has always been very attractive to our female colleagues. It is one of the specialties with the fastest growing female involvement at the level of residency training. This trend must be encouraged, and the immense potential of our female colleagues must be tapped effectively. From my experience in leadership, some of the most effective physician managers have been female. Women are most pleasantly wired to be easily moved by human suffering. Maybe this nature makes them very effective team members when the despondency and suffering imposed by visual impairment becomes an issue.

6. Remember the Importance of Humility and Advocacy
Ladies and Gentlemen, we live in a fast-paced world with uneven distribution of resources. While the developed economies are poised to record growth even in times of global adversity like the current COVID-19 pandemic, other segments of the world’s population, especially in our current location, are plagued by constantly dwindling resources. Therefore, leaving our offices, clinics, theatres, and other points in our comfort zones is imperative to engage with all relevant stakeholders to further the vision of Helping our people receive effective eye care.

Humility allows you to consider multiple suggestions and weigh them against the overall goal and targets. Remember that ‘No one person knows it ALL.’ Advocacy is an act or process designed and implemented by an individual or group to influence decisions within political, economic, and social institutions. Dear colleagues, we have our work cut out for us in this dimension. The targets of our advocacy are numerous, including the government at all levels, houses of legislature, corporate bodies, international agencies, and so on.

7. Choosing the Right Yardstick
The right measurement of progress involves evaluation which must be based on the right yardsticks. These must be:
- Fair
- Equitable
- Progress-oriented
- Measurable
- Devoid of bias

Don’t worry about the level of individual prominence you have achieved; worry about the individuals you have helped become better people.

Mr. Chairman, ladies, and gentlemen let us think about the metric by which our life will be judged and make a resolution to live every day so that in the end, our career will be judged a success.

I cannot end a talk such as this without challenging us to step out of traditional areas

**World-first bionic vision system poised for human trials**

*By Nick Lavars, September 22, 2020*

![Figure 2: World’s first bionic eye developed in Monash University, Australia](image)
of research to latch onto the current trends. The field of artificial intelligence, data analytics, and robotic medicine offer potential for cutting-edge technology in drug development, repurposing, and repositioning, which will improve our patient’s outcomes.

I read recently about the World’s first bionic eye developed in AUSTRALIA (Figure 2). Scaling up our capacity to play in the field of big-time research is inevitable if we are to help our people and make good impact on their lives. Fortunately, we have the workforce, we only need to harness our potential, and our limits are beyond the skies.

CONCLUSION
Medical practice/Management is the noblest of professions if it’s practiced well. No other occupation offers as many ways to help others learn and grow, take responsibility and be recognized for achievement, and contribute to a team’s success. Above all, no other profession immortalizes us in the hearts of people we have helped and cared for.

Ladies and gentlemen, please find time during this conference to enjoy the peace and serenity of Ilorin. If time and the LOC permit, you can take a 40-minute drive down the road to my hometown of OFFA to savour another dimension of Kwara state’s pleasures.

Mr. President, Members of LOC, distinguished ladies, and gentlemen thank you once more for inviting me, and thank you for listening.
Assessment of Topical Drug Instillation Techniques among Glaucoma Patients in a Tertiary Institution in Nigeria

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Introduction: Topical ocular pharmacotherapy is usually the first line of therapy to treat elevated intraocular pressure (IOP). Multiple factors can influence adherence to medications. An important factor that is often overlooked is the method of eye drop instillation. This study assessed the method of eye drop instillation among patients with primary open angle glaucoma (POAG) in a tertiary hospital.

Materials and Methods: Forty-three patients with POAG were recruited during the World Glaucoma Week celebration for this non-randomized interventional study. Participants completed a semi-structured questionnaire and were instructed to instill an artificial tear eyedrop just as they would instill their topical glaucoma medications at home. Participants were uniformly educated on proper drug instillation by an ophthalmologist and thereafter had a post-test to re-assess their instillation techniques. Parameters assessed were as follows: time (in seconds) taken to instill medication, delivery of eyedrops into conjunctival cul-de-sac, closure of eyes after drug instillation as well as observing tear duct occlusion.

Results: Forty-three participants diagnosed with POAG and on pressure lowering medications were interviewed. The age range was 18-83 years with a mean age of 55 ± 15.3 years. Majority of the participants were males 31 (72%) (Table 1). Eighteen (41.9%) had been on medical treatment for POAG for more than nine years. Thirty-two (74.4%) patients used fixed dose combination therapy, and majority (69.8%) instilled their medications twice daily (Table 2). Eleven (25.4%) respondents had not received health education on drug instillation techniques and about 60% reported that they did not occlude their tear ducts after drug instillation.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Participants N=43 Freq (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>≤20</td>
<td>2 (4.7)</td>
</tr>
<tr>
<td>21-40</td>
<td>4 (9.3)</td>
</tr>
<tr>
<td>41-60</td>
<td>25 (58.1)</td>
</tr>
<tr>
<td>&gt;60</td>
<td>12 (27.9)</td>
</tr>
<tr>
<td>Mean Age ±SD</td>
<td>55 ± 15.34</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>31 (72.1)</td>
</tr>
<tr>
<td>Female</td>
<td>12 (27.9)</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>2 (4.7)</td>
</tr>
<tr>
<td>Primary</td>
<td>9 (20.9)</td>
</tr>
<tr>
<td>Secondary</td>
<td>17 (39.5)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>15 (34.9)</td>
</tr>
<tr>
<td>Best corrected Distant visual Acuity in Better Eye</td>
<td></td>
</tr>
<tr>
<td>&gt;6/18</td>
<td>16 (37.2)</td>
</tr>
<tr>
<td>&lt;6/18</td>
<td>27 (62.8)</td>
</tr>
<tr>
<td>Duration of medical treatment for Glaucoma</td>
<td></td>
</tr>
<tr>
<td>1-3years</td>
<td>12 (27.9)</td>
</tr>
<tr>
<td>&gt;3-6years</td>
<td>8 (18.6)</td>
</tr>
<tr>
<td>&gt;6-9years</td>
<td>5 (11.6)</td>
</tr>
<tr>
<td>&gt;9years</td>
<td>18 (41.9)</td>
</tr>
<tr>
<td>Average cost spent monthly on glaucoma medications</td>
<td></td>
</tr>
<tr>
<td>≤N5,000($&lt;11)</td>
<td>8 (18.6)</td>
</tr>
<tr>
<td>&gt;N5,000($&gt;11)</td>
<td>35 (81.4)</td>
</tr>
<tr>
<td>National Health Insurance scheme (NHIS) subsidy cost for glaucoma medications</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8 (18.6)</td>
</tr>
<tr>
<td>No</td>
<td>35 (81.4)</td>
</tr>
</tbody>
</table>
Pre-assessment of drug instillation techniques among glaucoma patients

Twenty-eight (65.1%) of the participants instilled their medications within 15 seconds, 21 (48.8%) delivered the eyedrop into the inferior cul-de-sac, 28 (65.1%) closed the eyes after instilling the eyedrop and 10 (23.3%) occluded the tear duct after instillation (Figure 1).

Table 2: Pattern of use of medications among 43 study participants

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>N=43  FREQ (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy Regimen</td>
<td></td>
</tr>
<tr>
<td>Monotherapy</td>
<td>11 (25.6)</td>
</tr>
<tr>
<td>Fixed-dose combination Therapy</td>
<td>32 (74.4)</td>
</tr>
<tr>
<td>Number of times drugs are instilled daily</td>
<td></td>
</tr>
<tr>
<td>Once daily</td>
<td>10 (23.2)</td>
</tr>
<tr>
<td>12hrly (Twice daily)</td>
<td>30 (69.8)</td>
</tr>
<tr>
<td>8hrly (Three times daily)</td>
<td>3 (7.0)</td>
</tr>
<tr>
<td>Have you received health education on drug instillation techniques?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>32 (74.4)</td>
</tr>
<tr>
<td>No</td>
<td>11 (25.6)</td>
</tr>
<tr>
<td>Do you occlude your tear duct following drug instillation?</td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>4 (9.3)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>13 (30.2)</td>
</tr>
<tr>
<td>Never</td>
<td>26 (60.5)</td>
</tr>
</tbody>
</table>

Post-assessment of drug instillation techniques among glaucoma patients

There was an improvement in all techniques observed. Thirty-three (76.7%) of the participants instilled their medications within 15 seconds, 31 (72%) delivered the eyedrop into the inferior cul-de-sac, 38 (88.3%) closed the eyes after instilling the eyedrop and 23 (53.5%) occluded the tear duct after instillation (Figure 2).

Discussion: The pre-test observation in our study showed that majority of participants instilled their drugs within 15 seconds, delivered the eye drops on target (inferior conjunctival cul-de-sac) and closed their eyes after instillation, but did not occlude their tear ducts thereafter. Lanier et al. in his study demonstrated a relationship between nasolacrimal duct occlusion and drug efficacy. This association should be considered when educating patients on drug instillation techniques. A post-test evaluation showed an improvement in all parameters assessed for topical drug instillation. This corroborates the study done by Newman-Casey et al. which demonstrated that educational interventions often led to significant improvements in medication adherence. Patients who are on topical medication should be adequately instructed on the proper techniques for self-instillation of eye drops and motivated to use these techniques.

Conclusion: This study highlights an increased need for proper education of patients on drug instillation techniques.
Comparative Analysis of Central Corneal Thickness using Ultrasound and Anterior Segment OCT Pachymetry in Adults attending a Private Eye Clinic in Abuja

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Methods: A cross sectional comparative consecutive study carried out on 100 eyes of 50 patients attending Rachel Eye Center in Abuja from January to March 2021. CCT was first measured using the Pachscan ultrasound and then using the Optovue OCT machine, at 10 minutes interval to both eyes. Measurements were taken between nine and eleven am, in a sitting position and by one examiner and using same instrument. The average of two successive readings was taken for all instruments. Data was analysed using SPSS version 20 using Paired Sample t Test, Pearson’s correlation, Interclass Correlation and Bland Altman Methods.

Results: Patients were aged between 18 and 79 (mean age of 39.1), 72 males and 28 females. There was a statistically significant difference between both measures. The mean CCT was 537.36 ±33.26 and 510.94 ±33.13 for USS and OCT respectively with a mean difference of (26.42±9.53 p<0.001) [Table 1]. The repeatability of the two instruments using the means of the two repeated test show that the OCT has a smaller mean difference hence a better repeatability than the USS (Table 2). There was a very strong correlation of the 2 sets of measurements (r = 0.959 p<0.001). The correlation of the OCT values was higher than the USS values (Table 3).

Table 1: Descriptive statistics between OCT and USS Pachymeter measurements in 100 eyes

<table>
<thead>
<tr>
<th>OCT</th>
<th>USS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean + SD</td>
<td>510.940±33.13</td>
</tr>
<tr>
<td>Mean difference between USS and OCT (paired sample T test)</td>
<td>26.42±9.53 p&lt;0.001</td>
</tr>
<tr>
<td>Median</td>
<td>510.0000</td>
</tr>
<tr>
<td>Mode</td>
<td>525.00</td>
</tr>
<tr>
<td>Minimum</td>
<td>439.00</td>
</tr>
</tbody>
</table>

Table 2: The means of the two repeated test

<table>
<thead>
<tr>
<th>Mean Difference of both readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>USS1 0.20000±2.55423 (p=0.711)</td>
</tr>
<tr>
<td>USS2 0.08000±2.55423 (p=0.826)</td>
</tr>
<tr>
<td>OCT1 0.08000±2.55423 (p=0.171)</td>
</tr>
<tr>
<td>OCT2 0.08000±2.55423 (p=0.826)</td>
</tr>
</tbody>
</table>

Background: Central Corneal Thickness (CCT) measurement is useful in the management of glaucoma, ocular hypertension, corneal lesions and kerato-refractive surgeries. The Ultrasound Sonography (USS) being a contact test occasionally makes patients anxious and has some limitations. These include the risk of infection and abrasion to the cornea, the discomfort of the numbness due to anaesthetic drops and identifying the exact position to be measured by multiple users is a major challenge. The anterior segment optical coherence tomography (OCT) overcomes these limitations.

Aim: To compare the CCT measurements using USS and OCT, with a view to determine their correlation and the repeatability of each instrument.

References

There was a high average mean intraclass correlation coefficient of 0.843 between the two instruments and this was excellent (0.961) within the 95-percentile upper limit but poor in the (0.096) lower limit (Table 4). The Intraclass Correlation Coefficient of the OCT was higher than the USS. Howbeit both had excellent ICC values and remained excellent in the upper and lower bound intervals. Limits of agreement (LOA) was 7.726µm to 45.114µm. Four mean difference values were situated outside the LOA: 4, 51, 66 and 69µm (Figure 1).

Discussion: The study showed that the mean CCT using the OCT was significantly lower than the USS. Hence caution has to be taken as these two methods cannot be used interchangeably. In clinical practice we have to take into consideration the lower values OCT measurements produce, as these lower OCT values would cause further falsely elevated corrected pressure values. Hence a different algorithm may need to be used in correcting intraocular pressure as compared to the USS.

Majority of studies done have shown a statistically significant difference, with OCT recording lower measures. 1-7 A few studies reported OCT gives lower values but these values were not statistically different. 8,9 Although Ayala et al10 reported a reverse trend of OCT values being higher than CCT values, this was not statistically significant. Similar to our findings, various studies have also reported a high level of correlation.1,3,8

Conclusion: Measurements of CCT using the Pachscan ultrasound and the Optovue OCT correlated well, but the mean Pachscan measures were significantly higher than Optovue measures. This suggests that the two methods are not interchangeable and perhaps a different IOP correction algorithm may need to be developed for the OCT method.

Keywords: Central Corneal Thickness; Ultrasound Pachymetry; Optical Coherent Tomography

References

**Table 3: Pearson correlation**

<table>
<thead>
<tr>
<th></th>
<th>Pearson Correlation</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCT and USS</td>
<td>0.959</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>USS1 and USS2</td>
<td>0.994</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>OCT1 and OCT2</td>
<td>0.997</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

**Table 4: Intraclass correlation coefficient (ICC)**

<table>
<thead>
<tr>
<th></th>
<th>Intraclass correlation</th>
<th>95% confidence Interval lower bound</th>
<th>95% confidence Interval upper bound</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICC (USS/OCT) Single Measures</td>
<td>0.728</td>
<td>-0.046</td>
<td>0.926</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Average Measures</td>
<td>0.843</td>
<td>-0.096</td>
<td>0.961</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ICC (USS1/USS2) Single Measures</td>
<td>0.994</td>
<td>0.989</td>
<td>0.996</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Average Measures</td>
<td>0.997</td>
<td>0.994</td>
<td>0.998</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ICC (OCT1/OCT2) Single Measures</td>
<td>0.997</td>
<td>0.995</td>
<td>0.998</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Average Measures</td>
<td>0.999</td>
<td>0.997</td>
<td>0.999</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

If the average interclass correlation is greater than 0.7 it is then acceptable. If greater than 0.9 it is then excellent.

**Figure 1:** Bland-Altman plot with 95% limits of agreement (LOA)

**Background:** Measuring Central Corneal Thickness (CCT) using Optical Coherence Tomography (OCT) is more convenient for the doctor and patient as compared to the Ultrasound (USS) measurement. OCT is a non-contact test, anesthetic drops are not used, there is no risk of abrasion or infection and the exact position of the central cornea is measured as OCT maps out the center. Nevertheless, OCT values have been found to be statistically significantly lower than the USS measures, so both measures cannot be interchanged. Hence an algorithm is needed to convert OCT values to USS values after which the relevant intraocular pressure (IOP) correction factor can be applied in patient management.

**Aim:** To develop an algorithm to convert OCT CCT values to USS CCT values and apply the corresponding correction factor.

**Materials and Methods:** A cross sectional comparative study carried in 100 eyes of 50 patients attending Rachel Eye Center in Abuja from January to March 2021. CCT was first measured using the Pachscan ultrasound and then, using the Optovue OCT machine, at 10 minutes interval to both eyes. Measurements were taken between nine and eleven am, in a sitting position and by one examiner and using same instrument. The average of two successive readings was taken for all instruments. Data was analyzed using SPSS version 20 using the linear regression analysis. The linear regression formula was then applied to develop an algorithm to convert OCT CCT values to USS CCT values and apply the corresponding correction factor.

**Results:** A linear regression formula OCT=-2.184+(0.955 x USS) p<0.001 was derived. The linear regression formula was then imputed into Microsoft excel to derive the OCT CCT values of preset USS CCT values alongside their corresponding correction factors, which was obtained from the modified Ehler’s scale (Table 1).

**Discussion:** Algorithms to derive the correction factor of IOP from CCT have been in use since

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An Algorithm to Convert Optical Coherence Tomography Central Corneal Thickness Values to Ultrasound Central Corneal Thickness Values and its Corresponding Correction Factor

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2Asokoro District Hospital, Abuja
3College of Medical and Health Sciences, Bingham University Jos/Karu, Nigeria
4American Electric Power, Ohio, USA
Table 1: Modified Ehlers scale showing the CCT with its corresponding correction value (Ehlers et al)\textsuperscript{9,10}

<table>
<thead>
<tr>
<th>Central corneal thickness (um)</th>
<th>Correction value (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>410</td>
<td>10</td>
</tr>
<tr>
<td>415</td>
<td>10</td>
</tr>
<tr>
<td>420</td>
<td>9</td>
</tr>
<tr>
<td>425</td>
<td>9</td>
</tr>
<tr>
<td>430</td>
<td>8</td>
</tr>
<tr>
<td>435</td>
<td>8</td>
</tr>
<tr>
<td>440</td>
<td>7</td>
</tr>
<tr>
<td>445</td>
<td>7</td>
</tr>
<tr>
<td>455</td>
<td>6</td>
</tr>
<tr>
<td>465</td>
<td>6</td>
</tr>
<tr>
<td>475</td>
<td>5</td>
</tr>
<tr>
<td>485</td>
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</tr>
<tr>
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<td>4</td>
</tr>
<tr>
<td>505</td>
<td>3</td>
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</tr>
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<td>1</td>
</tr>
<tr>
<td>535</td>
<td>1</td>
</tr>
<tr>
<td>545</td>
<td>0</td>
</tr>
<tr>
<td>555</td>
<td>-1</td>
</tr>
<tr>
<td>565</td>
<td>-1</td>
</tr>
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<tr>
<td>635</td>
<td>-6</td>
</tr>
<tr>
<td>645</td>
<td>-7</td>
</tr>
</tbody>
</table>

Table 2: Modified Ehlers scale for OCT

<table>
<thead>
<tr>
<th>USS Central corneal thickness (um)</th>
<th>Corresponding OCT value [i.e. -2.184 + (0.955 x USS)]</th>
<th>Correction value/Adjustment in IOP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>410</td>
<td>389.4</td>
<td>10.0</td>
</tr>
<tr>
<td>415</td>
<td>394.1</td>
<td>10.0</td>
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<tr>
<td>420</td>
<td>398.9</td>
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<tr>
<td>425</td>
<td>403.7</td>
<td>9.0</td>
</tr>
<tr>
<td>430</td>
<td>408.5</td>
<td>8.0</td>
</tr>
<tr>
<td>435</td>
<td>413.2</td>
<td>8.0</td>
</tr>
<tr>
<td>440</td>
<td>418.0</td>
<td>7.0</td>
</tr>
<tr>
<td>445</td>
<td>422.8</td>
<td>7.0</td>
</tr>
<tr>
<td>455</td>
<td>432.3</td>
<td>6.0</td>
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<tr>
<td>465</td>
<td>441.9</td>
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<tr>
<td>475</td>
<td>451.4</td>
<td>5.0</td>
</tr>
<tr>
<td>485</td>
<td>461.0</td>
<td>4.0</td>
</tr>
<tr>
<td>495</td>
<td>470.5</td>
<td>4.0</td>
</tr>
<tr>
<td>505</td>
<td>480.1</td>
<td>3.0</td>
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<tr>
<td>515</td>
<td>489.6</td>
<td>2.0</td>
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<td>525</td>
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<tr>
<td>535</td>
<td>508.7</td>
<td>1.0</td>
</tr>
<tr>
<td>545</td>
<td>518.3</td>
<td>0.0</td>
</tr>
<tr>
<td>555</td>
<td>527.8</td>
<td>-1.0</td>
</tr>
<tr>
<td>565</td>
<td>537.4</td>
<td>-1.0</td>
</tr>
<tr>
<td>575</td>
<td>546.9</td>
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</tr>
<tr>
<td>585</td>
<td>556.5</td>
<td>-3.0</td>
</tr>
<tr>
<td>595</td>
<td>566.0</td>
<td>-4.0</td>
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<tr>
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<td>575.6</td>
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<tr>
<td>625</td>
<td>594.7</td>
<td>-6.0</td>
</tr>
<tr>
<td>635</td>
<td>604.2</td>
<td>-6.0</td>
</tr>
<tr>
<td>645</td>
<td>613.8</td>
<td>-7.0</td>
</tr>
</tbody>
</table>
Various algorithms exist such as Ehler's conversion scale (1975), Dresdner correction scale by Kohlhaas et al (2006), Doughty (meta analysis in 2000), Whitacre (1993) and Orssengo and Pye (1999) but the short fall of these algorithms is they were derived from USS or HAAG-Streit Pachometer and not OCT CCT values.

We have used the modified Ehlers conversion scale in our practice for years. The scale is the most popular algorithm in use and incorporated in most USS machines. Ehlers conversion scale has been modified for a population with average thickness of 545mmhg (which fits into our Nigerian average CCT value of 547±29.5um, 550±36.3, 548±34.28). Conclusion and Recommendation: The algorithm enables us to convert OCT CCT values to USS CCT values and apply the corresponding correction factor in managing our patients. There is a need for manufacturers of OCT machine to incorporate OCT designed algorithms for conversion scale in their machine as USS derived algorithms cannot be used interchangeably with OCT values.

**Keywords:** Algorithm; Convert; Central Corneal Thickness; Ultrasound Pachymetry; Optical Coherent Tomography

**References**

1. Okudo AC, Babalola OE. Comparing Central Corneal Thickness using Ultrasound and Anterior Segment OCT Pachymetry in adults attending a Private Eye clinic in Abuja. Submitted to NMJ
15. Iyamu E, Iyamu JE, Amadasun G. Central corneal thickness and axial length in an adult Nigerian population [Espesor central corneal y longitud axial en una población nigeriana]
An assessment of Glaucoma Awareness, Uptake and Satisfaction with a Free, Targeted Glaucoma Screening Programme in Ibadan, Nigeria

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Background: Glaucoma is the leading cause of irreversible blindness globally and in Nigeria and poor awareness and late presentation are major challenges with its management. Awareness and screening activities are key components of the care pathway. Some studies have shown that patients are more likely to be compliant with management plans if they are satisfied with the care they receive. Others have also evaluated the uptake of glaucoma services. However, there is a dearth of data on the uptake of, and patient satisfaction with free screening programmes.

Methods/Patients/Participants: This was a hospital-based, descriptive study of participants that accessed a six-week free eye screening programme targeted at people 40 years and older. In line with COVID-19 safety guidelines, a telephone-scheduled appointment-based system was employed to limit the number screened per day. All participants underwent ocular examinations including visual acuity (Snellen’s chart), anterior segment examination (slit-lamp examination), intraocular pressure measurement (Goldman’s applanation tonometer), posterior segment examination (78/90D), and gonioscopy (where applicable). Glaucoma diagnosis was based on values from the International Society of Geographical and Epidemiological Ophthalmology (ISGEO) classification and the Nigerian National Blindness Survey. Thereafter, participants were counselled and referred for further care as applicable before administering the patient satisfaction questionnaire. The association between prior awareness of glaucoma and socio-demographic and clinical features were explored using the Chi-Square test (p < 0.05 = significant).

Results: Ninety-four (47%) persons presented for the screening out of the 200 that scheduled an appointment with a mean (SD) age of 55 years (10.9). Forty-nine (52%) were males, 58 (62%) had attained at least tertiary education, and 58 (62%) had prior awareness of glaucoma. Nine (9.6%) had glaucoma and 25 (25.5%) were glaucoma suspects. Prior awareness of glaucoma was significantly associated with the male gender (p = 0.004, OR = 0.284, 95% C.I 0.118 - 0.681) and higher educational level (Table 1).

Level of Satisfaction: All participants were generally satisfied with the screening service and would recommend it to others (Figure 1). Seventy-seven (82%) persons would be willing to pay for screening.

Discussion: The study results showed a moderate level of prior awareness of glaucoma (58, 62%) which was comparable to findings in an
urban outreach population in Enugu (65.5%).\textsuperscript{12} Nine of the patients had undiagnosed glaucoma and a quarter (25) were glaucoma suspects, buttressing the importance of targeted screening.\textsuperscript{13} Though uptake was 47\%, there was a generally good level of satisfaction across all parameters evaluated. Patient care, whether free or paid, should be effective and patient-centered to ensure optimum utilisation.

**Conclusion:** Targeted eye screening can help with early detection of glaucoma. Patient satisfaction should be at the fore of eye health services to improve uptake.

**References**

Ketamine Anaesthesia to the Rescue in Paediatric Ophthalmic Procedures

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Background: Paediatric ophthalmic procedures including surgery and examinations often require some sedation/anaesthesia which may not be accessible or available for various reasons.¹ Ketamine has been found to be safe in paediatric age group.²–⁵ The use of ketamine, was a paradigm shift which became vital as a result of COVID-19 pandemic which reduced the availability of anaesthetists, in addition to other logistic challenges at a large tertiary hospital. The administration of ketamine for sedation/anaesthesia enabled us to deliver otherwise unavailable essential paediatric ophthalmic services⁶ during COVID-19 pandemic like the experience reported from elsewhere.⁷ The aim of this report is to describe the method and outcome of Ketamine anaesthesia as used for paediatric intraocular and extraocular procedures.

Methods: Between May 2020 and August 2021, ketamine was used initially in oral and subsequently as intravenous (IV) formulations for paediatric ophthalmic procedures. An oral dose of ketamine at 4mg/Kg in Vitamin C syrup was administered. This did not produce adequate sedation/anaesthesia after one hour of ingestion in the first six patients, hence IV ketamine was subsequently administered at 2mg/Kg, and preceded by IV Atropine 0.01mg/kg and IV diazepam 0.2mg/kg. The diazepam helps to reduce the dose of ketamine required for sedation. The Ketamine and diazepam were double diluted with water for injection and given slowly. Intravenous antiemetic (Ondansetron 0.1mg/Kg) was introduced after some cases of vomiting were observed. In addition to ketamine, 2.5mls of sub-tenon anaesthesia with lidocaine was used for intraocular surgeries. Oxygen was delivered via nasal prongs, the oxygen saturation (SpO2), pulse and blood pressure were monitored with a multiparameter monitor. The anaesthesia was administered by Ophthalmology team (resident doctors/consultants) members, later, a nurse anaesthetist became available to administer the Ketamine anaesthesia for the remaining patients. Adequacy of sedation/anaesthesia was judged by successful completion of the planned procedures without anaesthetic complications. The indications and outcome were entered immediately after each procedure into a Google form, the data was downloaded into Excel sheet and analyzed.

Results: A total of 143 paediatric ophthalmic procedures were carried out using ketamine over the period. The age range of the children was 6months to 12years with a mean age of 4.68years. There were 83(58%) males and 60(42%) females. The first six children were given oral ketamine which did not produce adequate sedation after one hour at the dose administered, thereafter, intravenous ketamine was administered to them before surgery commenced. The remaining 137 children subsequently had only intravenous ketamine administered intra-operatively for adequate sedation/anaesthesia. Ninety-five (66.4%) were for Retinoblastoma Examination Under Anaesthesia (EUA) with or without Trans-pupillary diode laser thermotherapy (8), there were three cases of enucleation for Retinoblastoma, 24 cases were for bilateral cataract and trabeculotomy & trabeculectomy / cycloablation, and 20 others were for fundus imaging, strabismus surgery, Probing and syringing for congenital nasolacrimal duct obstruction (CNLDO), excisional biopsy and trauma(3). The planned procedures were successfully completed without anaesthetic complications in all cases. The recovery from ketamine anaesthesia was quick,
and this shortened the time in-between cases. There were 8 (5.6%) cases of vomiting within 4 hours after the procedure. Raised intraocular pressure caused iris prolapse during surgery for a case of penetrating ocular injury.

**Conclusion:** Ketamine is cheap, readily available and requires minimum number of anaesthetic equipment. Back pressure from raised IOP was not a major challenge during intraocular procedures. Ketamine when given intravenously proved to be safe, well tolerated and effective in producing desired sedation/anaesthesia for Paediatric ophthalmic procedures; oral Ketamine was not similarly effective. Post-operative vomiting was the most common side effect and should be anticipated and prevented.

**Keywords:** Paediatric, Ophthalmic, EUA, Ketamine Anaesthesia,

**References**

Methods: Comparative analysis of ROP screening at the NICU was done for 2 periods: August 2019 to 2020 when ROP screening was done using an indirect ophthalmoscope in the NICU with August 2020 -August 2021 when ROP screening was carried out at the eye clinic using a widefield camera. NICU Admission data were entered into a Microsoft Excel spread sheet, those eligible for ROP screening were extracted and scheduled for screening. Babies who died were noted. The screening criteria of the Nigeria ROP group were used: birthweight < 1500g or gestational age (GA) of < 34 weeks. The first screening was performed within 30 days of life or at discharge whichever was earlier. Babies with Type I ROP had Anti-VEGF and or LASER treatment. The payment was out of pocket for the family.

Results: In total, 1272 and 1207 children were admitted into the NICU in 2019-2020 and 2020-2021 respectively. Survival among babies eligible for ROP screening was about 71.5%. Overall, 190 (66.4%) and 239(76.6%) were eligible for screening during each period, while 68 (35.7%) and 90 (37.7%) of those eligible and alive had screening done. Most babies missed screening because they were no longer in the NICU on the Wednesday scheduled for screening, having been previously discharged. Any stage ROP was 30 (19.2%) 16 males and 14 females. Type I ROP was about 7% among babies screened (Table 1).

Conclusion: The widefield retina camera increased the number of babies screened and reduced the number who missed ROP screening. Nevertheless, more than 60% of eligible babies missed ROP screening. Having a NICU based ROP coordinator stationed to schedule ROP screening every day and a widefield camera to be used by someone in the NICU might ensure that every baby is examined before discharge and on follow up. This, if done in addition to having a day set aside for routine ROP screening by ophthalmologists, might significantly increase the number of babies screened for ROP and reduce the number of babies missing appointment.

Despite this, several children were saved from life-long blindness. Missed ROP appointment must be put in focus and evaluated as part of ROP programs and efforts directed towards eliminating the obstacles that prevent any eligible baby from having ROP screening.

Table 1: Characteristics of ROP screening without and with wide field camera compared for two similar one-year periods from 2019-2021

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Estimates of proportions</th>
<th>August 2019/2020 Frequency (%)</th>
<th>August 2020/2021 Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total NICU Admission (A)</td>
<td></td>
<td>1272</td>
<td>1207</td>
</tr>
<tr>
<td>Number Eligible for ROP Screening (Birth weight ≤ 1500g, Gestation Age ≤ 34 weeks) (B)</td>
<td>(B/A) x 100</td>
<td>286(22.5%)</td>
<td>312(25.8%)</td>
</tr>
<tr>
<td>Number Eligible but Dead (C)</td>
<td></td>
<td>96</td>
<td>73</td>
</tr>
<tr>
<td>Number Alive- survival (and % of Eligible) (D)</td>
<td>(D/B) x 100</td>
<td>190(66.4%)</td>
<td>239(76.6%)</td>
</tr>
<tr>
<td>Number screened for ROP (% of alive and eligible) (E)</td>
<td>(E/D) x 100</td>
<td>68(35.7%)</td>
<td>90(37.7%)</td>
</tr>
<tr>
<td>Number Eligible, alive but missed Screening (F)</td>
<td>(F/D) x 100</td>
<td>122(64.3%)</td>
<td>149(62.3%)</td>
</tr>
<tr>
<td>Total number of babies develop ROP cases (of % Screened) (G)</td>
<td>(G/E) x 100</td>
<td>14 (20.6%)</td>
<td>16(17.7%)</td>
</tr>
<tr>
<td>Number of Type 1 ROP (H)</td>
<td>(H/E) x 100</td>
<td>5 (7.3%)</td>
<td>6 (6.6%)</td>
</tr>
</tbody>
</table>

NICU-Neonatal Intensive Care Unit
Keywords: ROP Screening, Missed ROP Appointment, Widefield Camera

References


Neuromyelitis Optica Involving the Area Postrema in a Nigerian Female: A Case Report

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Corresponding author: Nwako FU Email: ucnwako@gmail.com

Introduction: Neuromyelitis optica spectrum disorders (NMOSD) are a group of inflammatory diseases associated with demyelination of the central nervous system involving the optic nerves, brain and spinal cord.1 The clinical features, findings on neuroimaging, immunology, and histopathology are distinct.2 Literature on NMOSD in Africans is scarce.

Aim: This is to report a case of neuro-myelitis optica involving the area postrema in a Nigerian female.

Case Presentation: A 35-year-old Nigerian female presented to the University of Abuja Teaching Hospital with an 11-month history of sudden painless vision loss in the right eye associated with hiccup, nausea and non-projectile vomiting. She also complained of headaches. There was no history of seeing haloes around light nor bumping into objects by the side. Eleven months before presentation, she was diagnosed with retrobulbar optic neuritis and received oral steroids for a couple of weeks, at a different hospital, but noticed a marginal improvement in vision. However, she noted that her hiccups, nausea and vomiting persisted. Her presenting visual acuity was 6/60 in the right eye which did not improve with pinhole; and 6/6 in the left eye. Her colour vision was 2/10 in the right eye, and 6/10 in the left eye. She had a grade 2 relative afferent pupillary defect (RAPD) in the right eye. Dilated fundal examination revealed a moderately pale disc on the right, with indistinct margins temporally. In both eyes, she had a vertical cup to disc ratio of 0.5 and the ISNT rule was maintained. Intraocular pressure measured at 1.15 pm was 10mmHg in both eyes. She had an optical coherence tomography (OCT) that showed ganglion cell loss and retinal nerve fibre layer loss in the right eye (Figure 1). All other neurological examination was essentially normal. Magnetic Resonance Imaging of the brain and orbits with and without contrast showed hyperintense lesions in both sides of the dorsal medulla more on the right near area postrema (Figure 2). It also showed some hyperintensities in both optic nerves worse

Figure 1: Optical coherence tomogram of the patient showing diffuse ganglion cell and retinal nerve fibre loss in the right eye typical in neuromyelitis optica spectrum of diseases

Figure 2: Axial T2 Flair image of patient showing a hyperintense lesion in the dorsal medulla
Neuromyelitis optica spectrum disorders typically involve autoimmune destruction of aquaporin 4 (AQP4) channels in the central nervous system. Brain lesions are typical in areas like the area postrema which has high AQP4 expression. NMO prevalence is about 0.5-10 per 100,000 people and it is more common in females with a median age of onset between 32.6-45.7 years. Our patient is 35 years old. Hallmark symptoms of NMOSD include visual loss, limb weakness, sensory loss and bladder dysfunction with a remitting-relapsing course. Occasionally some patients present with nausea, vomiting, and hiccups. Symptoms, like the ones described above, are characteristic, while none of them is disease-specific, so clinical judgement is always necessary. A study from Mayo clinic revealed that 14% of their patients who were diagnosed with NMOSD had nausea and vomiting as their initial presentation. Most of the patients developed other neurological symptoms as the disease progressed. The International Panel for NMO Diagnosis revised the criteria in 2015 (Table 1) and came up with the following guidelines for diagnosis as outlined in NMOSD diagnostic criteria for adults. Diagnosis is primarily based on the presence of core clinical characteristics: AQP-4 antibody status, and MRI features. However, in patients whose AQP-4 antibody status is not available, diagnosis of NMOSD can also be made using clinical features and peculiar MRI features as shown below in Table 1. Our patient could not have AQP-4 antibody testing done because the test is not available in Abuja at the time of this report but she did meet the criteria for diagnosis based on the presence of 2 core clinical characteristics: optic neuritis and episodes of unexplained hiccups in addition to optic nerve enhancement and area postrema syndrome with associated dorsal medulla lesions as shown on MRI. Only 33% of patients with NMO present with brain stem syndromes. Dandu et al reported a case of NMOSD presenting with isolated area postrema syndrome with intractable nausea and vomiting. Figure 4 shows axial T2 Flair of the patient-reported by Dandu et al with the red arrow pointing to the hyperintensity in the dorsal medulla as similar to the location of the hyperintensity in our case as shown in Figure 2.
Table 1: The 2015 Revised international panel for NMOSD diagnosis

<table>
<thead>
<tr>
<th>Diagnostic criteria for NMOSD with AQP4-IgG</th>
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<tbody>
<tr>
<td>1. At least one core clinical characteristic</td>
</tr>
<tr>
<td>2. Positive AQP4-IgG</td>
</tr>
<tr>
<td>3. Exclusion of other alternative diagnoses</td>
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</table>

<table>
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<tr>
<th>Diagnostic criteria for NMOSD without AQP4-IgG or NMOSD with unknown AQP4-IgG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. At least two core clinical characteristics occurring as a result of one or more clinical attacks and meeting all the below requirements:</td>
</tr>
<tr>
<td>a) At least one core clinical characteristic must be optic neuritis, acute myelitis with LETM, or area postrema syndrome</td>
</tr>
<tr>
<td>b) Dissemination in space (two or more different core clinical characteristics)</td>
</tr>
<tr>
<td>c) Fulfilment of additional MRI requirements, as applicable</td>
</tr>
<tr>
<td>2. Negative tests for AQP4-IgG using best available detection method or testing unavailable</td>
</tr>
<tr>
<td>3. Exclusion of alternative diagnoses</td>
</tr>
</tbody>
</table>

Core Clinical Characteristics

1. Optic neuritis
2. Acute myelitis
3. Area postrema syndrome: episode of otherwise unexplained hiccups or nausea and vomiting
4. Acute brain stem syndrome
5. Symptomatic narcolepsy or acute diencephalic clinical syndrome with NMOSD-typical diencephalic MRI lesions

Additional MRI requirements for NMOSD without AQP4-IgG and NMOSD with unknown AQP4-IgG

1. Acute optic neuritis requires brain MRI showing (a) normal findings or only nonspecific white matter lesions, OR (b) optic nerve MRI with T2-hyperintense lesion or T1-weighted gadolinium-enhancing lesion extending over >1/2 optic nerve length or involving optic chiasm.
2. Acute myelitis requires associated intramedullary MRI lesion extending over three contiguous segments (LETM) OR greater than or equal to three contiguous segments of focal spinal cord atrophy in patients with history compatible with acute myelitis.
3. Area postrema syndrome requires associated dorsal medulla/area postrema lesions.
4. Acute brain stem syndrome requires associated periependymal brainstem lesions.

Conclusion: Neuromyelitis optica spectrum disorders with involvement of the area postrema is an atypical presentation and is rare in Africans. Prompt referral to the Neurologist is vital to prevent severe vision loss and death.

References

Intracranial Lesions Leading to Impaired Vision and Blindness in Aba, South-East Nigeria: A Case Series

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Background: Visual impairment due to intracranial lesions could be debilitating and may present initially to the ophthalmologist. Ophthalmological manifestation of intracranial space occupying lesions correlates with the site of the brain lesion. This study aims to report 7 cases of intracranial lesions leading to visual impairment and blindness with a view to enhancing knowledge of visual symptoms in patients with intracranial space occupying lesions.

Methods: This is a case series carried out at Abia State University Teaching Hospital (ABSUTH) Aba, South-East, Nigeria. The subjects were patients who presented to the ophthalmology clinic with features suggestive of intracranial space occupying lesions from June 2013 to May 2018. Ophthalmic assessment and cross-sectional radiological investigations were carried out on all patients. Demographic data and other relevant information were extracted from their case notes and presented below.

Case 1: A 54-year-old female housewife presented with double vision, eye and head ache, and hemiparesis of 2 months duration. Significant past medical history was hypertension and a fall. Bilateral splinter hemorrhage was noted on fundoscopy. Radiologic diagnosis was chronic bilateral subdural hematoma.

Case 2: A 39-year-old male civil servant presented with blurred vision, double vision and photophobia of 1 year duration. Fundoscopy revealed pale left optic disc, not cupped and bilateral impending macula holes. A radiological diagnosis of pituitary macroadenoma was made.

Case 3: A 44-year-old male trader presented with double vision, tinnitus, inability to walk, syncope and vomiting. The eye findings were normal. A radiological diagnosis was left cerebral and cerebellar ischaemic infarction.

Case 4: A 16-year-old female student presented with bilateral visual loss of 2 months duration. Significant past medical history was recent onset of urinary incontinence and enuresis. Pupils were mid dilated and not reactive to light. Atrophic optic discs were seen on funduscopic examination and a radiological diagnosis of craniopharyngioma was made.

Case 5: A 37-year-old female interior decorator presented with reduced vision, eye and headache of 2 years duration. There was no light perception on the left eye and a sluggish right pupil. On fundoscopy, bilateral lens opacities, disc atrophy and posterior subluxation of the right lens were elicited. Radiological diagnoses were bilateral cataracts and cerebral glioma.

Case 6: A 19-year-old female student presented with double vision on distant gaze and right convergent squint of 2 weeks duration. Bilateral disc edema was seen on fundoscopy. A diagnosis of right middle cerebral artery aneurysm was made on computed tomography.

Case 7: A 46-year-old male trader presented with bilateral blurring of vision of 4 months duration. Significant past medical history was head trauma and hypertension. The pupils were mid dilated and sluggish. Patient was blind in both eyes. Fundoscopy revealed bilateral hazy media and optic disc atrophy. Neurodegenerative disease was diagnosed on magnetic resonance imaging.

Discussion: Visual abnormalities, impairment and blindness may be the presenting features of an intracranial space occupying lesion. Its recognition can aid in timely detection and prompt application of diagnostic and therapeutic modalities leading to a reduction in morbidity and mortality. About sixty percent of patients in this case series presented with diplopia. Disorders causing diplopia may arise due to lesions affecting any part of the third, fourth and sixth cranial nerves or due to diseases affecting the extra ocular muscles. Paresis of the lateral rectus muscle due to aneurysm of the middle cerebral artery, can lead to left convergent squint. The optic disc splinter hemorrhage in the patient with subdural haematoma can be explained by the fact that the...
subarachnoid space around the optic nerve is continuous with the subdural space of the brain.\textsuperscript{7} Headache is a common manifestation of intracranial space occupying lesions;\textsuperscript{1,8} it is probably due to raised intracranial pressure. Urinary incontinence and enuresis were noted in a 16 year old patient with a huge craniopharyngioma. Cortical lesions like tumors can lead to inappropriate voiding secondary to depressed social awareness, decreased sensation and/or inappropriate urethral sphincter relaxation.\textsuperscript{9}

**Conclusion:** There are varied presentations of intracranial space occupying lesions. Detailed history, clinical examination and ancillary investigations should be recommended for patients in which clinical suspicion of intracranial space occupying lesion is high.

**References**


Pattern of Presentation of Patients with Macula Holes in Ibadan, South-Western, Nigeria

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Introduction: Macula holes are defects in the fovea involving the inner limiting membrane up to the photoreceptor layer. Different local studies in Nigeria have shown prevalence of 6.6% and 0.5% respectively. The common risk factors include age and female gender. Central visual loss is a common feature while bilaterality may be seen in about 30% of patients with macula holes. Aim: To describe the pattern of presentation, aetiology and risk factors of patients with macula holes seen at the retina clinic of a tertiary teaching hospital.

Methods: A retrospective study of all patients with macula hole diagnosed both clinically and with the aid of optical coherence imaging between the period January 2019 to December 2020. The demographic data, best corrected visual acuity, presenting complaints, and other relevant data relating to co-existing ocular & systemic co-morbidities were retrieved from patients’ case notes. Optical coherence tomography scans from the SOCT Copernicus machine where available were retrieved and interpreted. Statistical analysis was done with SPSS Version 23.

Results: Thirty-nine (4%) of 972 patients seen in the retina clinic during the study period had a diagnosis of macula hole. Twenty of the respondents were females and 19 were males giving a male to female ratio of 0.95:1. The mean age was 62.3 years (SD 15.1). Forty-three eyes were involved as five of the patients had bilateral macula holes. The age range of the respondents was 11 - 81 years.

The commonest presenting complaint was poor vision present in 31 (79.3%) respondents (Table 1), while 21 patients (53.8%) had noticed onset of symptoms less than a year prior to presentation. The best corrected visual acuity was equal to or less than 6/60 in 15 (48.4%) eyes and 6/60 - 6/18 in 13 (41.9%) eyes respectively. Idiopathic or age-related macula holes were the most common aetiology in 27 (69%) respondents (Table 2). Traumatic macula holes were seen in 6 patients (15.45%), especially in the younger age-group (< 40 years of age).

Thirty-nine (90.7%) of the 43 eyes in this study had stage 4 macula hole with intra-retinal cysts being the commonest finding on optical coherence tomography (Figure 1).

The commonest co-existing ocular morbidity was rhegmatogenous retinal detachment in 4 myopic eyes. Other ocular co-morbidities include proliferative sickle cell retinopathy (2), toxoplasmosis (3)

Table 1: Presenting complaints of patients with macula holes

<table>
<thead>
<tr>
<th>Presenting complaints</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in vision</td>
<td>31</td>
<td>79.3</td>
</tr>
<tr>
<td>Blurring of vision</td>
<td>4</td>
<td>10.4</td>
</tr>
<tr>
<td>Sudden visual loss</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Eyeache</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Trauma</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2: Aetiology of macula holes among the study patients

<table>
<thead>
<tr>
<th>Aetiology</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idiopathic/Age related</td>
<td>27</td>
<td>69.2</td>
</tr>
<tr>
<td>Trauma</td>
<td>6</td>
<td>15.4</td>
</tr>
<tr>
<td>Myopia</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Others (proliferative sickle cell retinopathy, toxoplasmosis)</td>
<td>3</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>100</td>
</tr>
</tbody>
</table>
pseudophakia (2), inverse hypopyon (1) and mild NPDR amongst others.

**Discussion and Conclusion:** The prevalence of macula hole of 4% was similar to Benin but slightly lower than the figures of 6.6% and 6.4% in all patients with retinal disorders seen in Port-Harcourt and Ado-Ekiti respectively. The aetiology of the macula holes in our patients was mainly idiopathic with many of the patients being in the elderly age group and is comparable with similar studies in Nigeria. \(^3\), \(^4\), \(^5\)

Traumatic macula holes accounted for 15.5% of all the macula holes in our cohort of patients which is similar to findings from Port Harcourt. \(^2\) Macula holes are a cause of presentation of patients with poor vison in the Retina clinic. Prompt diagnosis, management and examination of the other eye in patients with macula hole is essential.

**References**


**A Case Report of Behcet Disease in King Abdulazziz Specialist Hospital Sakaka Aljouf - Region Kingdom of Saudi Arabia**

**Introduction:** Behçet disease is a rare vasculitic disorder that is characterized by a triple-symptom
complex of recurrent oral aphthous ulcers, genital ulcers, and uveitis. The systemic manifestations can be variable. Ocular disease has the greatest morbidity, followed by vascular disease generally from active vasculitis. Cutaneous manifestations can occur in up 75% of patients with Behcet disease and can range from acneiform lesions, to nodules and erythema nodosum. Gastrointestinal manifestations can be severe; and differentiating Behçet disease from active inflammatory bowel disease can be clinically difficult. This is case report of a patient with many of the above features.

Case Report: A 24-year-old male patient presented at the Emergency Department with a 1-day history of headache, marked reduction in vision, pain, photophobia and watering of the left eye. There was no antecedent history of trauma or previous eye surgery. This patient is a known diabetes mellitus patient with fair blood glucose control. There was history of recurrent oral ulcer, however no history of genital ulcers. There was also associated history of mild joint pain.

Ocular Examination showed visual acuity of perception of light OS and 6/6 OD. There was full extraocular muscle movement in all directions of gaze in both eyes. The left eye showed mild lid oedema, ciliary injection, moderate depth anterior chamber with hairline hypopyon, >10 cells in the left eye, applanation tonometry of 16mmhg, brown iris however no rubeosis iridis, obvious posterior synechia, oval shaped pupil with sluggish reaction to light, early cortical opacity, blurred view of vitreous, blurred view of pink oval disc, reduced fovea reflex, flat retina, normal vessel and periphery. The anterior and posterior segments of the right eye were essentially normal. A clinical assessment of Behçet Eye Disease with fairly controlled Diabetes Mellitus was made.

The managing team requested for blood and radiological investigations in tandem with Behcet disease and uveitic workup. Investigation results included elevated white blood cells count, elevated erythrocyte sedimentation rate, elevated blood glucose and glycosylated hemoglobin, positive C-reactive protein. Images of pre & post treatment B-mode ultrasound scans are shown in Figure 1 and Figure 2 respectively.

The patient was admitted and was placed on topical combination of steroidal and nonsteroidal anti-inflammatory medication; topical cycloplegic; parenteral methylprednisolone in normal saline infusion given slowly over 30mins. Daily ward review of the left eye over the 3 days of admission showed the following evaluations:

Improved visual acuity from perception of light to

---

Figure 1: Before treatment reveals multiple echogenic foci suggestive of Bechet Panuveitis Disease

Figure 2: After treatment revealed complete resolution of echogenic foci previously seen
6/9 OS and quiet anterior chamber over 3 days on admission.

**Conclusion:** Behcet’s disease may cause either anterior uveitis or posterior uveitis, and sometimes causes both at the same time. This reported case has both left eye anterior and posterior uveitis. Anterior uveitis results in pain, blurry vision, light sensitivity, tearing, or redness of the eye as also seen in this case.

**References**


**Pattern of Presentation of Sickle Cell Retinopathy in Ilorin**

**Olatunji V A, Owa Y E, Okeke G O, Olokoba L B**

**University of Ilorin Teaching Hospital, Ilorin, Kwara State**

**Corresponding author:** Olatunji V A. E-mail: ayotunji03@yahoo.co.in; 08100189941

**Purpose:** This study aimed at determining the pattern of clinical presentation of sickle cell retinopathy in the eye clinic at the University of Ilorin Teaching Hospital, Ilorin.

**Methods:** A retrospective review of the medical records of twenty-three sickle cell patients who were seen over a period of 5 years. Necessary information was extracted from the records.

**Results:** A total of 23 patients were seen. The majority of the participants were males (65.2%) and 87% were of the hemoglobin SC genotype. The mean age was 33.4 ± 8.7 years with a range of 18 to 60 years. About 78% were below the age of 35 years, however, most (60.9%) were within the age range of 26-35 years (table 1). Of all participants, 56.5% had tertiary education and 21.7% had secondary education. Varying grades of proliferative sickle cell retinopathy (PSCR) were present in all the patients. Less than half of the patients presented within three months (43.5%) of onset of symptoms. Blurring of vision (60.9%) and seeing of floaters (39.1%) were the commonest symptoms. About half (47.8%) of the presenting eyes had a visual acuity (VA) less than 3/60 at presentation and 70% of presenting eyes had grade 4 or 5 PSCR. Grade 3 PSCR was present in 39.1% of fellow eyes. The patients with tertiary education were more likely to present early (p=0.048). One patient was bilaterally blind from PSCR. Loss of vision was due to PSCR in 95.6% of cases.

**Discussion:** HbSC genotype accounts for 87% of patients with retinopathy as seen in this study and this is similar to previous reports. Most of the patients were between 26 and 35 years of age in this study. This is in agreement with previous studies. Almost half of the patients seen in this study were blind at presentation as was reported by Oluleye. Late presentation of these cases has been reported in previous studies and this was a similar finding in our study.

<table>
<thead>
<tr>
<th>Table 1: Age and gender of patients</th>
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<tr>
<td>Age category (Years)</td>
</tr>
<tr>
<td>15-25</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Pattern of Presentation of Sickle Cell Retinopathy in Ilorin

Olatunji V A, Owa Y E, Okeke G O, Olokoba L B

University of Ilorin Teaching Hospital, Ilorin, Kwara State

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Purpose: This study aimed at determining the pattern of clinical presentation of sickle cell retinopathy in the eye clinic at the University of Ilorin Teaching Hospital, Ilorin.
**Conclusion:** Most patients with SCR in this study presented within the age range of 26-35 years with stage 4 or 5 disease. Awareness on screening needs to be created among the patients and the physicians on the preventable nature of vision-threatening sickle cell retinopathy.

**References**


Bilateral Cataract as the First Presentation of Type 1 Diabetes in a 14-Year-Old Nigerian Girl: A Rare Case

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Background: Cataract is a known complication of Diabetes mellitus (DM) in clinical practice.1,2,3 DM, usually the type 2 (Non-Insulin Dependent Diabetes NIDD) is first diagnosed in some persons when they visit the Ophthalmology clinic.4 The objective of this report is to draw attention of type 1 diabetes mellitus (T1DM) in a child presenting first to the eye clinic with cataract.

Case Presentation: Miss UN, a 14-year-old student, presented with two weeks history of bilateral gradual painless blurring of vision. Past ocular history was not significant. There was history of polyuria, polydipsia and polyphagia, weight loss and fatigue. She was not a known diabetic, no history of hospitalization in the past. Her mother passed away two years earlier from end stage renal disease (ESRD) complicating type 2 DM. No family history of T1DM.

On physical examination, she was conscious and alert, general condition appeared satisfactory. Visual acuity was 6/60 and counting fingers on the right and left eye respectively. The anterior segment examination revealed bilateral cataract. Slit lamp examination showed posterior capsular opacity and snowflakes opacities respectively in the right and left eyes (Figure 1). Poor red reflex with hazy media was noted on the right eye while there was no red reflex on the left eye. Intraocular pressure was 16mmHg bilaterally. Her random blood glucose level was 580mg/dl on presentation. She was referred to the endocrinologist and was managed for diabetic ketoacidosis and severe acute malaria.

She had bilateral phacoemulsification with white double aspheric monofocal foldable intraocular lens implants inserted. Intraoperative posterior capsular opacification was noted. Visual acuity in both eyes after surgery was 6/18 in both eyes. She had YAG laser posterior capsulotomy four weeks after the surgery. Her vision improved to 6/9 in the right eye to 6/6 in left eye. Posterior segment examination showed no diabetic retinopathy.

Discussion: The patient in this report, presented with blurring of vision first to the ophthalmologist with the classical symptoms of DM. This underscores the need for universal screening for DM considering that it is estimated that 1 in 2 of adults who have DM in the world currently are not diagnosed.5 She had a poor glycaemic control at presentation (HbA1C 16.3%) which again underscores the leading role of increasing HbA1C as one of the risk factors for development of early diabetic cataract.6 The patient most likely had diabetic symptoms before the visual incapacitating effect of cataract was observed but this was probably overlooked by the guardians. More importance was attached to the visual disability rather than the life threatening diabetes.
It is worth noting that the prompt surgery offered to the index patient went a long way to improving her quality of life.

**Conclusion:** Bilateral cataract is an uncommon condition in children and adolescents with type 1 diabetes. It can rapidly develop especially in the setting of diabetic ketoacidosis and or prolonged poor glycemic control. There is need to maintain the screening of all cataract patients for diabetes to detect undiagnosed diabetes.

**References**


**Sight Restoration Project Among Internally Displaced Persons (IDP) in Dalori Camp, Borno State, January 2016**

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**Introduction:** The insurgency in the north eastern Nigeria took its worst toll in Borno State which has more devastation in terms of loss of thousands of lives and properties/means of livelihood worth billions of naira. These results into tens of thousands of internally displaced persons (IDPs) (mostly elderly men, women and children most of whom were orphaned as a result of the insurgencies by the renowned terrorist a.k.a “Boko Haram”).

**Objective:** To restore sight among the IDPs with operable cataracts in Dalori IDPs Camp in Borno state.

To screen and treat cases of allergic/vernal conjunctivitis among the internally displaced children in Dalori IDPs Camp in Borno state.

**Methods:** A descriptive study comprising of IDPs who were mainly from Kanuri, Shua Arabs, Hausa Fulani tribe had since been booked in the Nigeria Airforce Emergency Hospital (Figure 1) located in the IDP camp for small incision cataract surgery with posterior chamber intraocular lens implantation. The outcome of the procedure was analyzed.

**Figure 1:** The Nigerian Airforce Emergency Hospital Dalori IDP Camp Dalori Borno State 50km from Dalori village, Gwoza and Sambisa Forest
Procedure: The patients with operable cataracts were counseled about the small incision cataract surgical procedure with posterior chamber intraocular lens implantation (Figure 2). All patients had routine pre-operative investigations (Biometry, full blood count, fasting blood sugar, retroviral screening, and urinalysis) and preoperative vital signs (blood pressure/pulse rate) were evaluated. Informed consent was obtained and all patients were screened for explosives/IUDs by security operatives. They all underwent small incision cataract surgery with posterior chamber intraocular lens implantation and were reviewed on the first day post-operatively. All post-operative medications were instilled as at when due, initially by the nurses for 2 days. Patients were discharged back to their camps after 2 days.

Discussion: Most of the cases done had good vision after small incision cataract surgery with profound excitement and gratitude to the entire team especially the great and gallant soldiers and officers of the Nigerian Air Force.

Conclusion: The phase 1 project is a tremendous success in preparing the internally displaced persons who can now see to return to their various settlements across the insurgency ravaged areas.

Results: A total of 18 patients underwent surgery and all of them were above 49 years of age. There were 15 male patients (83.3%). All patients had preoperative visual acuity <6/60. On the first day post-op three (16.7%) patients had visual acuity = 6/60, four (22.2%) patients had visual acuity between 6/60–6/18, and 11(61.1%) patients had visual acuity >6/18. As at one week post-operatively, the visual acuity of 14(77.8%) patients had improved to 6/18 or better. In all, 17 (94.4%) patients experienced improvement in vision within 1 week after the procedure.

References

Simple Technology to Enhance Practice and Training in Ophthalmology: Experience with Automated Dupe A-P Trainer

Dupe Ademola-Popoola

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Background: All ophthalmology training units irrespective of resource capacity require simulation for surgical and non-surgical training as dry and/or wet labs before graduation to live patients; this is to ensure safety and competency in ophthalmology.1,2 Available simulators vary greatly in complexity and cost. They range from high fidelity, high-cost devices like the Eyesi® and Helpmesee® to moderate devices like the Kitaro®, Bionico®, Philips studio®; these are
typically expensive for individual training units even in highly resourced centres. Low cost manually operated such as Idrees® eye surgical practice model are also available. This report describes the features and utilization of the first known automated, low fidelity practice head technology for surgical training in wet labs and some for clinical procedures, which would be most useful in most low resourced ophthalmology training units.

**Methods:** Low cost, automated eye trainer (Dupe A-P) was produced to serve as a holder for practice eyes (bull, goat or pig) in the wet lab, to teach surgical procedures such as trabeculectomy, cataract surgical steps (SICS), intravitreal injections and Intra ocular pressure measurement (Figure 1). It was developed from a fully manual system to a fully automated model over a nine-year period. It works by creating an adjustable negative pressure system to hold the enucleated goat, pig or bull eyes on one or both sockets of the individually made head-face model. Training with it can be further enhanced by utilizing microscope adapters with smartphones holders which may be attached to the ocular of an assistant microscope to record and document surgical procedures via the camera of a smartphone. This is then transmitted via wireless connection systems for real time or asynchronous tele-training purposes (Figure 2).

**Results:** Automated Dupe A-P eye trainer has been deployed for training in the wet labs of ophthalmology training institutions for 11 years from 2010 and for assessment purposes during National Postgraduate Medical College of Nigeria examinations which hold twice a year. They were used during objective structured practical examination stations with an average of 85 candidates at each examination over 4 years from 2017. It is typically used to train and assess suture placement, cataract surgical steps, intravitreal injection, and trabeculectomy surgical steps on enucleated animal eyes. It can also be used for training on intraocular pressure measurement and Trans-scleral Laser Techniques.

**Conclusion:** Automated Dupe A-P low-cost technology for practice and training has been used to enhance competency and assessment in Ophthalmology and is recommended to all training institutions while efforts to continue to improve the functionality are encouraged.

**Keywords:** Microscope Adapter, Dupe A-P Eye Trainers, Simulators, Training devices.

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Orbital Alveolar Rhabdomyosarcoma Mimicking a Capillary Haemangioma: A Case Report

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Introduction: Rhabdomyosarcoma (RMS) is the most common malignant tumour of childhood[1]. Orbital RMS is a rare tumour with annual incidence of 4.3 cases per million children [1]. In approximately 10% of cases the primary site is the orbit [2]. Orbital RMS is usually seen in the first decade of life. Primary orbital RMS involves the orbit, eyelid, conjunctiva, and rarely, the uveal tract. The typical presentation is a rapid onset of unilateral proptosis, eyelid edema and ptosis.

Capillary haemangioma (CH) is a common benign orbital vascular tumour of childhood characterized by appearance at birth or shortly after birth, rapid increase in size for 6 to 12 months and then gradual involution over 5 to 7 years [3]. CH may cause proptosis or globe displacement [4].

Case Presentation: A twelve-year-old girl, presented with right eye protrusion of seven years’ duration. As the protrusion increased in size, she gradually lost vision in the eye. The left eye was normal. There was no history of headache, syncopal attacks and seizures or remarkable weight loss, there was no swelling of any other part of the body. She had presented four years earlier with three years’ history of protrusion, was assessed and diagnosis of capillary haemangioma (based on clinical findings and imaging) was made at the time. She responded to oral propranolol with some regression of the proptosis, however, she defaulted from follow up.

Figure 1: The patient with massive proptosis of the right eye

On examination, there was proptosis of the right eye, with a mass measuring 12 cm X 14 cm (Figure 1). The mass was firm, mildly tender with visible dilated superficial vessels on the upper lid. There was severe chemosis of the conjunctiva and the cornea was opaque. The left eye was essentially normal. There were no masses on the scalp, no...
significant pre auricular, post auricular, mandibular or cervical lymphadenopathy. A clinical assessment of capillary hemangioma was made. Computed tomographic angiography showed dilated right facial artery, right superficial temporal artery and left facial artery (Figures 2 and 3).

Rhabdomyosarcoma is a close differential, however, it is typically a fast growing highly invasive tumour, though it can also be very vascular \[^{[5,6]}\].

**Conclusion:** Orbital CH and RMS can have very similar features. To the best of our knowledge this might be the first case of ARMS mimicking CH to be reported. Therefore, ophthalmologists should always keep an open mind, especially in long standing cases like this one. RMS can be slow growing as seen in this case.

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**Floppy Eyelid Syndrome: A Case Report**

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**Introduction:** Floppy eyelid syndrome (FES) is an under-diagnosed unilateral or bilateral eyelid...
malposition. This was initially reported in 1981 by Culbertson and Ostler. Commonly involving the upper eyelids, it presents as recurrent or chronic ocular surface irritation and chronic papillary conjunctivitis of upper palpebral conjunctiva. Patients initially present with non-specific symptoms including eye irritation and a long history of unilateral or bilateral ocular redness and discharge. FES is frequently unrecognized cause of these non-specific symptoms and is non-infectious. Symptoms of FES are common to other diseases making it difficult to diagnose early. FES result from eyelid laxity due to significant decrease in elastin content of the tarsal plate. This results in characteristic loose floppy eyelids with associated punctate epithelial keratopathy (PEK), ptosis of lateral eyelashes and typical conjunctival changes. It is associated with easy eversion of the upper lid which can flip open easily during sleep, predisposing to ocular surface exposure. Symptoms are severe on waking from sleep and patient may have obstructive sleep apnea. Patients who sleep on one side more than the other tend to have more severe changes. Several unsuccessful trials of artificial tears, vasoconstrictors, topical steroids, non-steroidal anti-inflammatory drops, or antibiotics may have been used before correct diagnosis is made. It is commonly diagnosed among middle-aged obese patients (40-50 years), though has been reported in age between 25-80 years. The incidence of FES is slightly higher in men than women and common among caucasians. FES is also associated with keratoconus, glaucoma and some systemic conditions, high blood pressure, diabetes, downs syndrome, ischemic heart disease and skin and collagen diseases. The main treatment is surgical, though conservative treatment like lubricants and weight loss in the obese have been tried.

Case Report: A 30-year-old teacher was referred to our facility with complaints of redness of left eye, outward turning of the lower lid and drooping upper eyelids. He developed spontaneous redness of the left eye on waking up from sleep and three days after the onset of redness, the patient noticed that left eyelid was drooping which necessitated his visit to the peripheral hospital where some medications were given. There was associated scanty milky discharge, swelling and outturning of the left lower eyelid, and drooping of the eyelids noticed on waking. Worsening of the symptoms necessitated a visit to the referring hospital where microscopy, culture and sensitivity was done. Conjunctival swab grew Staphylococcus aureus, biopsy of the lesion showed acute inflammatory cells and computed tomography of the Brain was not contributory. Patient has hand and foot deformity present since birth. Ocular Examination showed bilateral severe Ptosis, lower lid Ectropion in the left eye, conjunctival Keratinization and conjunctival congestion (Figures 1 and 2).

Patient had Lateral Tarsal strip with Retractor reattachment and Fornix forming suture on the left eye.

Figure 1: Easy eversion of the left lower eyelid

Figure 2: Appearance of the left eyelid before surgery
Outcome was satisfactory with eyelids remaining well positioned and opposed to the ocular surface till the time of this report (Figures 3 and 4).

Conclusion: Floppy eyelid syndrome is quite a difficult case to diagnose especially when it presents initially with only ocular surface irritation without obvious flipping of the eyelids after sleeping.

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Isolated Ankyloblepharon Filiforme Adnatum in a Nigerian Neonate

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Introduction: Ankyloblepharon filiforme adnatum (AFA) is a rare congenital malformation affecting the eyelids. It consists of a single or multiple bands of tissues joining the upper and lower lids either unilaterally or bilaterally. This is different from simple ankyloblepharon where the lid margins are fused directly.

AFA is amblyogenic and when associated with other congenital abnormalities it may account for high mortality and morbidity. We report a case of a newborn with isolated AFA treated on the twentieth day of life.

Case Report: This is a case report of a 20 days old male neonate, product of term gestation in a non-consanguineous marriage. Pregnancy and delivery were uneventful. He presented with inability to open both eyes since birth and noted

Figure 3: Left eyelid appearance in the immediate post-operative period

Figure 4: Left eyelid appearance more than six months after surgery
to have partially fused lids with bands of tissue arising from the grey line attached to both the upper and lower lids (Figure 1).

The adhesions were divided with the use of Vannas scissors and McPherson’s forceps, cutting along the lid margin on the upper lid and lower lid. There was minimal bleeding and no sedation or local anesthesia was required.

At follow up visit, no abnormality was noted and both eyelids were opening normally (Figure 2).

Pediatrician’s review found no other congenital abnormality hence diagnosis of an isolated AFA was made.

**Discussion:** Ankyloblepharon filiforme adnatum (AFA) is a rare but potentially amblyogenic congenital abnormality of the eyelids, it can be isolated as in our patient or associated with other congenital anomalies. Treatment is by simply excising the bands without sedation or anesthesia.\(^4\)

The band is composed of a central vascular connective tissue with muscle fibers and sub-epithelial glands found on histology.\(^5\)

The pathogenesis involves a temporary arrest of the growth of epithelium or more probably, an abnormally rapid proliferation of mesoderm allowing union of the lids.\(^5\)

Ophthalmic associations include iridogoniodygenesis and juvenile glaucoma.\(^1,6\)

Our patient had an isolated AFA, however he will be followed up to monitor the intraocular pressures in case he develops infantile or juvenile glaucoma.

**Conclusion:** Ankyloblepharon filiforme adnatum (AFA) is a rare congenital condition which can be easily missed at birth. Early diagnosis and treatment is necessary to avoid amblyopia and because AFA can be a pointer to other multisystemic disease.

**References**

Case Report on a Child with a Penetrating Orbital Injury from Wood

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Background: Penetrating orbital injury is relatively common during civil life. These injuries can be globe sparing or globe involving, they can also be sight or life threatening. Intraorbital foreign bodies may occur after direct trauma. Injuries in wood workers may be responsible for one out of every six orbital injuries. Wood/stick injuries have been reported to be the common cause of penetrating orbital injury. Prompt treatment of these injuries is important to prevent loss of vision and other complications that may lead to loss of life. These injuries are commoner in young men. This is a case report of a 9-year-old boy who had orbital injury caused by a piece of wood.

Case Report: A 9-year-old boy from Plateau State, North Central Nigeria was seen with a piece of wood in the left orbit. There was pain and bleeding from the eye and subsequent swelling of the lids with difficulty opening the eye (Figure 1). The child was oriented in place and person, the right eye was essentially normal. On the left eye there was bleeding from the site of injury and a piece of hard fixed wood logged around the left orbit close to the nasolacrimal sac area displacing and hindering visualization of the globe. The lid was swollen and tender however gentle parting of the lid revealed chemosis and the child was able to count fingers at a meter.

The otorhinolaryngologist and anesthesiologist were invited to review the patient. Random blood sugar, hemoglobin level, urea and electrolyte were all normal. The globe was normal on Ocular ultrasound scan. Patient had intramuscular anti-tetanus serum (1500 IU), intravenous fluid, paracetamol, metronidazole and ceftriaxone given while waiting surgery. An informed consent was obtained for exploration and foreign body removal.

Surgical procedure: With the child under general anesthesia an artery forceps was used to pull out the piece of wood (Figure 2), there was a dead space leading into the maxillary sinus which was irrigated with saline and filled with chloramphenicol ointment. The outer wound was sutured interruptedly using Vicryl 6-0 Suture. The patient was placed on systemic and topical antibiotics, systemic antifungal, analgesics and chymotrypsin all for 5 days and was discharged after 5 days with significant improvement in vision to 6/6 and resolution of the chemosis.

Discussion: Orbital trauma can be blunt or penetrating. Penetrating orbital injuries can be through the skin and bone into the orbit, through the lids and sometimes through the interpalpebral fissure. It has been reported that different materials can penetrate the orbit. The globe is at risk of damage from penetrating orbital injury and these objects also have the tendency of causing brain injury as they can extend to the cranial cavity. Pencils have been reported to be the commonest form of wooden intraorbital foreign bodies. A study done in North western Nigeria showed penetrating orbital injuries to account for 4.2%.
Orbital cellulitis has been reported to occur as a complication in some cases.\textsuperscript{8}

**Conclusion:** Early presentation and treatment of penetrating orbital injuries is crucial in preventing complications.

**References**


**Introduction:** Infection in the orbital soft tissues, posterior to the orbital septum results in orbital cellulitis\textsuperscript{1}. This is an ophthalmic emergency, which may occur as a complication of sinusitis by contiguous spread or may result from haematogenous spread or from trauma\textsuperscript{2}. Orbital cellulitis presents with periorbital swelling, proptosis, conjunctival chemosis and injection, extraocular motility deficits and visual loss. It requires co-management by the ophthalmologist and ENT-surgeon when secondary to sinusitis\textsuperscript{3}. This study was carried out to investigate the presentation and management of orbital cellulitis in Prince Mutaib Bin Abdulazziz Hospital Sakaka Aljouf Kingdom of Saudi Arabia.

**Methods:** A retrospective study of orbital cellulitis managed in Prince Mutaib Bin Abdulazziz Hospital of Aljouf Region was conducted among patients referred and admitted between 2017 and 2019. Orbital Cellulitis was diagnosed among 9 patients all within the pediatric age group (3 – 16) years. The clinical symptoms, signs, investigations performed and the approach of management were recorded into a proforma.

**Results:** Of the nine patients, eight had unilateral disease while one had bilateral orbital cellulitis. Two cases were secondary to trauma. Fever was present in six patients. Upper respiratory tract infection and features of sinusitis were present in four patients. There were no prior abdominal symptoms and signs among the patients. Eight patients had elevated white blood cell count above > 10,000 /mm\textsuperscript{3} and all nine patients had elevated erythrocyte sedimentation rate. Blood culture was negative after 48hrs in all the patients with commencement of broad-spectrum parenteral antibiotic. Chest radiological features of resolving multiple small nodular or reticulonodular opacities was reported in five patients. Positive Computed Tomography (CT) Scan findings (Evidence of soft Tissue Inflammation) was observed in eight patients, especially ethmoidal sinusitis (Figure 1) among older children and maxillary sinusitis. CT-Scan with Cerebral Abscess was found in one patient (Figure 2). All cases had multidisciplinary approach to their management. Eight patients had full recovery with broad spectrum parenteral antibiotic treatment. One patient had surgical intervention of abscess drainage with subsequent full recovery.
Conclusion: People with periorbital cellulitis experience a swelling of the eyelid in one eye. A 2020 article notes that it is more common in children than in adults. However, most cases resolve after 5–7 days of taking antibiotics as discovered among all the studied patients.

References

Management of Penetrating Eye Injury with Retained Intraocular Foreign Body in Prince Mutaib Bin Abdulazziz Trauma Centre/Hospital, Saudi Arabia: A Case Report

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Introduction: Appropriate and adequate eye protection when performing visually threatening activities is the most effective method to prevent ocular trauma. The American Academy of Ophthalmology Eye Injury Snapshot is a yearly survey designed to collect data and educate the public about the causes and prevention of eye injuries. Through educational programs such as this, potential eye injuries may be prevented. The aim of this report is to describe the management of a patient with penetrating retained intraocular foreign body.
Case Report: A 24-year-old female patient presented with 2-hour history of ocular injury. She was hit in the left eye by a nail while hammering it into a wall at home. This was associated with instant severe pain, redness, watering and reduction in vision. She was immediately rushed down to the emergency room of the trauma centre. She experienced left eye severe pain, reduction in vision, lid swelling, redness, foreign body sensation, watering, and orbital fullness.

Evaluation at the emergency room revealed acutely traumatized lady with obvious left hypereemic lid swelling and protruding nail from the globe with subconjunctival heamorrhage (Figure 1). Examination with a bed side portable ER slit lamp device revealed left eye clear cornea, deep anterior chamber, nil hypheama, round and reactive pupil, clear lens, indirect ophthalmoscopy of the left eye also revealed anterior third of the metallic nail in the vitreous extending from the left medial pars plana. No obvious traumatic retina tear nor vitreous heamorrhage seen. The examination of the right eye was essentially normal with good vision. A diagnosis of left penetrating eye injury (with retained protruding nail) was made. Urgent Operating room (OR) request was sent to schedule patient for urgent left eye foreign body (bracket nail) removal and globe repair under general anesthesia. Informed consent was obtained prior to surgery. Left eye conjunctiva exploration, foreign body removal and globe repair was done (Figure 2).

The visual acuity assessment of left eye post op revealed counting fingers at 3m at 1st day post operation. This however improved to 0.7 Logmar visual acuity by 3 days post operation.

Discussion: Ocular penetrating and perforating injuries (commonly referred to as open globe injuries) can result in severe vision loss or loss of the eye. Penetrating injuries by definition penetrate into the eye but not through and through—there is no exit wound (this particular case has no exit wound). Perforating injuries have both entrance and exit wounds. Early presentation, severity of injury, involvement of retina, macular prognosticate the outcome of the prompt review and repair.

References

Eyelid Sarcoid Lesions in a Middle-Aged Man in Abuja, Nigeria: A Case Report

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$^{1}$Rachel Eye Center Abuja, Nigeria
Background: Sarcoidosis is a chronic non-caseating granulomatous inflammation that affects multiple systems. The commonest systems that are affected are the pulmonary system, skin and eyes. Ocular manifestation of sarcoidosis have been reported in 12.9–79.2% of patients with sarcoidosis. Within the eye it commonly presents as uveitis while lid manifestation is a rare form of presentation. Despite a thorough literature search we did not come across a reported case of lid involvement of sarcoidosis in Nigeria.

Case Report: We report a case of sarcoidosis involving the eyelid in a Nigerian eye clinic. Lid masses are sometimes overlooked by both the patient and attending physician. This report is on a 47 year old Ghanaian man, who was referred by a dermatologist to a private eye clinic in Abuja, Nigeria. He had multiple eyelid lesions (Figure 1), skin lesions on his scalp, back of his ear and neck, as well as a history of coughing and wheezing. Histopathology of skin biopsy confirmed sarcoidosis (Figure 2). Chest Xray showed hilar lymphadenopathy. He was placed on tabs prednisolone 20mg daily for 8 weeks. The symptoms abated and have not reoccurred 3 years post treatment.

Discussion: Sarcoidosis affects a myriad of systems such as in the reported case. He had pulmonary, skin and ocular involvement. Despite a thorough literature review we did not come across a case of lid presentation of sarcoidosis in Nigeria. Although this might be because the lid presentations are being underreported, the lid lesions and mild pulmonary symptoms might occasionally be overlooked by the patients and physicians. It is necessary to take biopsies of atypical lid lesions especially when there is a pulmonary involvement. We placed the patient on prednisolone tablets instead of a steroid-based cream because of the multisystemic involvement and steroid based cream can cause chemical injury to the eyes as they are made for skin preparation and the compositions are not ideal for ocular use. Once the steroids were commenced the patients cough and wheezing stopped. Also, the steroids need to be used for a considerable duration until all symptoms and signs abate before it is tailed off to prevent recurrence.

In conclusion to our knowledge this is the first report of lid manifestation of sarcoidosis in Nigeria. There is a possibility these cases exist and are underreported. Atypical eyelid lesions with pulmonary involvement should be biopsied and sent for histopathology. Systemic steroids are effective in treating lid involvement of sarcoidosis. The management of sarcoidosis requires a

Figure 1: Right and Left Eye Sarcoidosis Lesions (Pre-Treatment)

Figure 2: Histopathology micrograph: x10. Granuloma within the giant cells. Stretched epidermis with numerous intradermal granulomas composed of aggregates of epitheloid cells with lymphocytes and giant cells.
multidisciplinary approach between the physician, dermatologist and ophthalmologist.

**Keywords:** Eyelid, scalp, ear, neck sarcoid lesions, coughing, wheezing, hilar lymphadenopathy, prednisolone, biopsy

**References**


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**High Myopia in Transpupillary Thermotherapy Treated Retinoblastoma – CASE REPORT**

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**Background:** Transpupillary LASER Thermotherapy (TTT) is typically used in retinoblastoma (RB) to salvage vision. The children are often young and the focus is typically to manage the tumour without much attention being placed on assessment of visual acuity. Children who are treated with LASER for retinopathy of prematurity have been found to have higher incidence of myopia. The follow up schedule in such young children with RB is usually designed to review regression or to ensure there are no new tumours or metastasis, and visual acuity assessment is not routinely done in early life. Because of the young age of children who are treated with TTT for RB, it is not clear whether they also more susceptible to developing myopia. A previous study on refractive errors in children treated for retinoblastoma reported more hyperopia in posteriorly located tumours, it was however was not related to treatment provided. Macula tumours were found to mostly have poor prognosis while visual outcome had no correlation Reese-Ellsworth classification not Excluding Reese-Ellsworth group VB diseases. It was also reported that despite laser application directly to the fovea, 57% of patients with macular retinoblastoma retained 20/80 or better vision.

**Case Report:** A five-year-old male child who lived about 250km from our tertiary RB centre where he was managed for bilateral retinoblastoma from 5 months of age. He had 6 sessions of chemotherapy, enucleation of the right eye and 4 sessions of TTT to multi-foci tumour in the left eye all within the first year of life to achieve remission of the RB. One of the tumours was inferior to the macular (Figure 1).
The child was lost to follow up for 2 years, and then presented at the age of 5 years on account of poor vision in the eye which had impacted his school performance. There was no known history of myopia in family. On evaluation, he had myopia of -10.5 Dioptres and amblyopia for which he received eyeglasses.

This brought up the question of “How often does myopia occur after TTT for RB in children”, Is there a causal relationship between TTT for RB and myopia? Is this related to the number or location of the tumour? Studies should be designed to provide answers to these questions.

Conclusion: Visual acuity assessment should be routinely done early in the follow up care of children with Retinoblastoma who are treated with LASERS so that early intervention could be implemented should myopia develop.

Keywords: Transpupillary Thermotherapy, Retinoblastoma, Myopia, Vision Salvage

References

Pterygium Recurrence in a Private Eye Clinic in Abuja

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Background: The major concern following pterygium surgery is recurrence. The study aims to compare the recurrence rate between 5-fluorouracil and conjunctival autograft and the risk factors for recurrence.

Methods: This was a retrospective study carried out in Rachel Eye Center, Abuja, over a 5-year period. The clinical records were obtained from the operation and patients case notes. Information retrieved included demographic characteristics, type of surgery, recurrence and duration of recurrence. Data was analysed using the descriptive, compare means and logistic regression analysis functions of SPSS version 20 Chicago, IL, USA.

Results: A total of 57 pterygium surgeries were carried out accounting for 8.8% of the total surgeries done over the period. The mean age of the participants was 47.47 years and there were 44 males (77.2%) and 13 females (22.8%). Pterygium recurrence was seen in 19 cases (33.3%). The mean duration of recurrence i.e., the average time between the surgery and onset of recurrence noticed in the clinical notes was 11.5 weeks. Thirty five percent of those that had excision with 5FU and 28.6% of those that had excision with conjunctival autograft had recurrence (p=0.664). The risk factors for recurrence were age below 50 years. There was a 5 times greater risk of those younger than 50 to have pterygium recurrence [OR 5.25; 95% CI (1.45 – 19.0) p=0.012]. Thirty four percent of males as compared to 30.8% females had recurrence (p=0.823). There was a 2 times greater risk of

Table 1: Comparison of recurrence rates with demographic and clinical characteristics (N=57 eyes)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Recurrence Frequency(%)</th>
<th>No Recurrence Frequency(%)</th>
<th>Total</th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
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<tbody>
<tr>
<td><strong>Age</strong></td>
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<tr>
<td>Less than 50</td>
<td>15(50)</td>
<td>15(50)</td>
<td>30</td>
<td>5.25 (1.45-19.0)</td>
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<tr>
<td>Greater than 50</td>
<td>4(16)</td>
<td>21(84)</td>
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<td><strong>Sex</strong></td>
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</tr>
<tr>
<td>Males</td>
<td>15(34.1)</td>
<td>29(65.9)</td>
<td>44</td>
<td>1.16(0.31-4.41)</td>
<td>0.823</td>
</tr>
<tr>
<td>Females</td>
<td>4(30.8)</td>
<td>9(69.2)</td>
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<td><strong>Type of pterygium</strong></td>
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<tr>
<td>Secondary</td>
<td>2(50)</td>
<td>2(50)</td>
<td>4</td>
<td>2.12(0.27-16.34)</td>
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<td>Primary</td>
<td>17(32.1)</td>
<td>36(67.9)</td>
<td>53</td>
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<tr>
<td><strong>Type of surgery</strong></td>
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<tr>
<td>5FU</td>
<td>15(34.9)</td>
<td>28(65.1)</td>
<td>43</td>
<td>1.34(0.36-5.00)</td>
<td>0.664</td>
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<tr>
<td>Conjunctival autograft</td>
<td>4(28.6)</td>
<td>10(71.4)</td>
<td>14</td>
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<tr>
<td><strong>Surgeon</strong></td>
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<td>Senior</td>
<td>7(31.8)</td>
<td>15(68.2)</td>
<td>22</td>
<td>0.89(0.287-2.78)</td>
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<td>Junior</td>
<td>12(34.3)</td>
<td>23(65.7)</td>
<td>35</td>
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</table>
those with secondary pterygium to have recurrence (OR 2.12; 95% CI (0.27 – 16.34) p=0.472).

**Discussion:** We observed that slightly fewer recurrences occurred amongst those that had excision with conjunctival autograft (EWCA) as compared with excision with 5FU (EW5FU). We are encouraged to do more cases of (EWCA) although this method takes longer time of surgery and may requires suture removal afterwards.

There have been high rates of recurrence using 5FU as compared to other adjuncts. Onwasigwe et al\(^1\) in University of Nigeria Teaching Hospital reported 52% recurrence following EW5FU and much lower recurrence of 13.6% seen with mitomycin C, Onnebune et al\(^2\) in University College Hospital, Ibadan reported a recurrence of 47.4% with EW5FU, they also observed a tremendously lower recurrence of 9.6% when excision was combined with 5FU and conjunctival autograft. This means we should combine both methods for a much more favorable outcome. Bekibele et al\(^3\) in a randomized clinical trial reported 5FU was found to be marginally superior to excision with autograft and not statistically significant.

We found those younger than 50, males and those with secondary pterygium tend to have more recurrences and recommend conjunctival autograft or combined adjuncts for these patients. Olusanya et al\(^4\) also reported a 5.6 times greater risk of those younger than 50 years as compared to those older and males had a higher recurrence than females.

**Conclusion:** Pterygium Excision with conjunctival autograft was found to be slightly more successful than pterygium excision with 5FU. People younger than 50 years were found to have a 5 times greater risk of recurrence as compared to those older patients.

**Keywords:** Pterygium; Recurrence; 5 fluorouracil; Conjunctival autograft; Risk factors

**References**

Appraisal of Sustainability of Kwara Eye Care Programme: Post Non-Governmental Organization Support


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Background: Kwara state is one of the 36 states in Nigeria with 16 local government areas and an estimated 4 million population. Kwara Eye Care Programme was initiated in 2003 with the support of Sightsavers, a Non-Governmental Organization (NGO) with the aim of eliminating avoidable blindness in Kwara State. The programme enjoyed two cycles of support from Sightsavers during which set targets were met and landmark achievements recorded through the collaboration. Sightsavers ended financial support in 2013 with full devolution of the programme to the state government. Seven years after, service delivery is ongoing, human resources and infrastructural development have been reinforced to sustain the impact of the programme directly through the state government-based direct coordination. Challenges to sustainability that have been highlighted in studies especially in Africa includes poor funding, weak political will, limited local counterpart capacity, donor dominance during the project and overly ambitious designs of project. This study therefore aims to appraise how the State Government was able to sustain the formerly co-funded project.

Methods: This was a qualitative study which involved interviewing of patients, relatives of patients, service providers and government officials. We also reviewed the end of program report (2013), Key Performance Indicators (KPI) (2013-2020) and observational check list. These include the number of ophthalmic personnel, acquisition of equipment, infrastructural upgrade, surgical services for cataract and glaucoma, numbers of patients seen (new and old) as well as outreach services and access to financial resources. Diffusion of innovations theories were also used to assess level of sustainability using 4 attributes (relative advantage, compatibility, complexity and triability).

Results: The results showed availability of accessible ongoing services (at 3 base hospitals) through affordable out of pocket payment and social safety nets with cataract surgical output being steadily maintained between 2817 and 2248 from year 2013 till end of 2019 (Figure 1). KPIs in year 2020 were grossly impaired by the general restriction in movement/lockdown as part of the measures instituted to combat the COVID-19 pandemic in the state. Budgeted funds are now being released by the State government for outreach services, procurement of equipment (Table 1) and infrastructural upgrade. The recently introduced monthly running cost is being sustained while the erstwhile unit driven drug/consumable revolving system has been modified with more involvement of the central supply chain. Human resources have increased in number (Figure 2) and are self-motivated. The presence of additional 5 Ophthalmologists had enhanced overall steady output, access to specialists, concomitant improved quality of care and improvement in their respective capacity to deliver high volume surgical services.

Identified challenges include weak coordination among the now independent base hospitals, low compliance to newer government policies, attrition of Ophthalmologists and Ophthalmic nurses, gaps in record keeping, COVID-19 pandemic and
Table 1: Level of sustainability of the different aspects of eye care achieved by the State government

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Sustainability</th>
<th>Relative* Advantage</th>
<th>Compatibility**</th>
<th>Triability***</th>
<th>Complexity</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Train Ophthalmologist</td>
<td>Yes</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Train Ophthalmic nurses</td>
<td>Yes</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>School eye health</td>
<td>No</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Outreach services</td>
<td>Yes</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Supply of surgical Equipment and consumables</td>
<td>Yes</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Budget Release</td>
<td>Yes</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Facility based consultation</td>
<td>Yes</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Cataract and Glaucoma surgery</td>
<td>Yes</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Refraction/Optical services</td>
<td>Yes</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

* Relative Advantage: This compares the expected advantage of the new initiative with the benefits provided by the previous one that it replaced.

** Compatibility: This is perceived when the new idea or technology introduced by the innovation is consistent with the mandate of the adopters or the adopting system and does not require significant modifications from the adopters.

*** Triability: The notion that an innovation can be tested on a small scale.

Complexibility- perceived difficulty in understanding a new idea or using a new technology

Figure 1: Trend in cataract surgical output in Kwara eye care program over 7 years

**Spike is on account of a one-off mass cataract surgical intervention by another collaborating donor organization.

Figure 2: Human resource development by the State government
unsatisfactory remuneration breeding the quest for private practices.  

**Conclusion:** Seven years down the line, the Kwara State Eye Care Programme has remained relevant as a state government solely driven eye care project and has remained impactful in providing quality services for common blinding diseases. The success recorded so far, as reflected in Table 1, indicates that most of the indices were close to the optimal score of 20, which translates to an overall good level of sustainability. Meanwhile, the scope of service delivery has been poorly encompassing for school eye health, with a low score of 6, owing to weak central co-ordination, limited resources (for training, retraining of teachers, coverage and monitoring) and reduced motivation. Unlike many other co-funded programmes in the state that go into oblivion following the exit of the NGO\(^6\), this study revealed that the state government has shown greater commitment to ownership in funding and sustaining the programme. In place are, proper budgetary allocation, impactful use of resources, appropriate subsidy and passionate human resources. There is need to ensure that members of the workforce are well motivated in order to retain specialists thereby sustaining quality service delivery.

**References**

coupled with good surgical outcome. However, some of the patients were not able to pay for their surgeries as such the management approached a local Non-Governmental Organization (NGO) to help out by reducing the cost of cataract surgery per eye to the barest minimum. With this support, the number of cataract surgeries in the hospital increased astronomically. When other NGOs saw what the local NGO had done they also joined and together they were able to sponsor more than 3,000 cataract surgeries in a year.

The above was made possible because of good leadership that was in place right from inception; and the qualities of a good leader are enumerated below.

**Vision:** A leader must know the vision of the organization, see possibilities and identify opportunities but does not stop there. He/ she must turn these ideas into actions that place the organization ahead.

**Integrity:** The importance of integrity should be obvious as a top-level executive who charts the organization course and making countless significant decisions. He/she must be honest (not stealing), of high moral standard (not having loose relationship with the opposite sex that will undermine discipline in the system) and lead by example (must not come late to work and so will be able to discipline others).

**Courage:** A leader must have courage and the ability to speak up with willingness to face challenges, he/she must be able to deal with staff issues appropriately without favoritism or tribalism and to solve immediately any problem that can bring down the organization.

**Communication:** The leader must be able to communicate in clear terms and in various ways what the intended activities are to all cadre of staff as this will positively affect the growth of the organization.

**Influence:** The leader should have the ability to convince others through a logical proof for a change that will bring progress to the organization. He/ she must ensure that all staff are stakeholders and to motivate them when they excel in special areas, by so doing they will work harder to uplift the institution by increasing productivity thereby making the organization a high volume center.

**Training:** The leader must identify and train the best staff in relevant fields that will increase the uptake of patients in the hospital, they must be ready to transfer skills they had acquired to others in the system so as to increase productivity. The leader should provide a conducive working environment and skill acquisition by so doing when the leader is away, work still go on as normal with high productivity.

**Equipment:** The leader must go for the best and the latest equipment by following the advancement in technology, he/she should order for large quantity of instruments e.g. 30 Cataract sets, 10 Microscope, 5 Glaucoma sets, etc. This is so because in a private organization you must not wait for instrument to be repaired, it should be replaced immediately for work to continue, while the broken down instrument await repairs, by so doing there will be no time loss, targets are met, and the organization will be a high volume center.

**Collaboration:** A leader must learn to collaborate with others because together we can do more, this is why ECWA Eye Hospital, Kano is a high volume center because it has strong collaboration with International and local NGOs for high volume cataract surgeries. This is achieved as follows; the cost of paying cataract surgery is seventy thousand naira only per eye and no waiting list, but when an NGO decide to support patient and to do large number, the cost is only fifteen thousand Naira only. With this, interested individuals or corporate organizations can do as many as five thousand cataract surgeries in a year as shown below in Figure 1 and 2.

As seen in literature, children population is estimated to be 75 million out of which 75,000 are said to be blind from various causes and 7,500 are blind from cataract. Reducing blindness in this age group require appropriate planning with

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**Figure 1:** Free Paediatric Cataract Surgery sponsored by Christoffel Blindenmissiom (CBM)
well equipped centres that have collaboration with NGOs.

**Outcomes:** As a result of collaboration with NGOs the hospital was able to do a total of 3,033 cataract surgeries for adults and 675 for children in the year 2019 as shown in Table 1. In the year 2020, the world experienced the COVID-19 pandemic. In spite of that, the hospital was able to perform 2,112 cataract surgeries for adults and 78 for children as shown in Table 2.

**Conclusion:** The secret to achieving high volume in any center has to do with good leadership, who are committed to the vision of the organization, with the hope of training and retraining of staff in all sub-specialty of Ophthalmology, this will lead to high quality cataract outcome that is affordable which will lead to high volume.

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**Table 1:** ECWA Eye Hospital, Kano Statistics for the year 2019

<table>
<thead>
<tr>
<th>JAN. TO DEC. 2019</th>
<th>ADULTS</th>
<th>CHILDREN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refraction</td>
<td>8,657</td>
<td>1,192</td>
<td>8,049</td>
</tr>
<tr>
<td>Glasses Dispensed</td>
<td>2,618</td>
<td>661</td>
<td>3,279</td>
</tr>
<tr>
<td>Low Vision Devices Dispensed</td>
<td>8</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Cataract Surgery (Hospital Based)</td>
<td>3,033</td>
<td>675</td>
<td>3,708</td>
</tr>
<tr>
<td>Trabeculectomy/ Goniotomy</td>
<td>1,390</td>
<td>50</td>
<td>1,440</td>
</tr>
<tr>
<td>Lid surgery</td>
<td>16</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Squint surgery</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>IOL Scleral Fixation</td>
<td>26</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>Others</td>
<td>673</td>
<td>122</td>
<td>795</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>16,562</strong></td>
<td><strong>3,599</strong></td>
<td><strong>20,161</strong></td>
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</tbody>
</table>

**Table 2:** ECWA Hospital, Kano statistics for the year 2020.

<table>
<thead>
<tr>
<th>JAN. TO DEC. 2020</th>
<th>ADULTS</th>
<th>CHILDREN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refraction</td>
<td>6,857</td>
<td>1,192</td>
<td>8,049</td>
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<tr>
<td>Glasses Dispensed</td>
<td>2,618</td>
<td>661</td>
<td>3,279</td>
</tr>
<tr>
<td>Low Vision Devices Dispensed</td>
<td>8</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Cataract Surgery (Hospital Based)</td>
<td>2,112</td>
<td>78</td>
<td>2,190</td>
</tr>
<tr>
<td>Trabeculectomy/ Goniotomy</td>
<td>1,085</td>
<td>70</td>
<td>1,155</td>
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<tr>
<td>Lid surgery</td>
<td>12</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>Squint surgery</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>IOL Scleral Fixation</td>
<td>34</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>Others</td>
<td>530</td>
<td>181</td>
<td>711</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>13,264</strong></td>
<td><strong>2,188</strong></td>
<td><strong>15,452</strong></td>
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</tbody>
</table>

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**References**

Strategy and Outcome of Large-Scale School and Community-Based Vision Care for Children


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Background: Most countries in the developing world have significant disparities in accessibility to paediatric eye care. The large number of children in need of eye care compared to available specialist eye care teams has informed the need to deploy different strategies to reach a large number of children for comprehensive, expert level vision care to ensure continuum of care from detection, referral, through treatment and rehabilitation.

The aim of this report is to provide a template of adaptable and scalable strategies for childhood blindness/visual impairment detection through management which was executed in six geopolitical zones of Nigeria. It specifically describes the outcome of large-scale school and community based comprehensive vision care program for children including those with special needs (blind, deaf or mentally challenged).

Methods: This report is a presentation of the strategies that were implemented in public schools in one of the 36 states of Nigeria and among children with special needs (blind, deaf or mentally challenged) in six states across the country - one from each of the six geopolitical zones. The strategies included selection and training (physical or virtual or hybrid) of personnel; preparation and procurement of resources, advocacy, information management, logistics, task shifting, use of digital equipment and documentation during comprehensive eye evaluation of school children.

The key elements included the development of the following: standard operating procedures (SOP) and a checklist of all the vital equipment and documents. This were verified before and after every outreach. Screening was done through task-shifting to teachers and other volunteers who identified and documented referral of children who failed vision screening and the type of possible eye problems using TELVIS® kit. The kit incorporates pictures of eye problems in addition to visual acuity charts. Date and location of comprehensive eye evaluation were agreed and communicated during half day training for the teachers and volunteers.

High quality equipment with digital output display are preferable including tonometers, fundus camera, autorefractors, weighing scales, blood pressure/glucose monitors. Ready-made eye glasses of different powers were ordered and then fixed into frames ahead of the evaluation date, one-third redundancy for number expected are incorporated. Air and ground transportation arrangements were made ahead of the comprehensive eye evaluation. The project team members, equipments, other essential supplies, and the children who had been referred by the teachers/key informants were transported to the location of the comprehensive eye evaluation by the specialist eye care team members.

The comprehensive evaluations were done at readily accessible locations in the community/school. Fewer children were transported to the location with the largest number of children. Direction of flow of the eye evaluation and vision
care were marked on appropriate surfaces (Figure 1). Eye care team members wore identification/branded materials to help coordination of activities while onsite. Schools/communities were given different times of the day for the evaluation for efficiency and crowd control. Volunteers who participated in screening were incorporated into organizing and documentation during comprehensive evaluation in schools/communities.

All the findings during the comprehensive evaluation and vision care were documented in a proforma. Health Support for teachers/volunteers was considered essential, and included eye examination, blood pressure check, weight, height for BMI calculation and random/blood sugar check and referral where necessary.

**Results:** Between March 2018 and April 2021, 141,434 children <16 years were enrolled for vision care using the strategies described. Altogether, 137,781 (97%) were in Kwara State: comprising 62,657 (17.5%) of 545,450 children in 242 (12.3%) of 3,316 conventional public primary schools and 75,124 who had vision screening done by 106 key informants in communities. The others were 3,653 (84%) of 4,335 children with special needs enrolled in the 52 schools for such children located in six Nigerian states.

Vision screening was done over a two-week period by 757 (2.9%) teachers in schools and/key informants in the communities using TELVIS® kits. Overall, 10,513 (7.4%) children and 3,121 teachers were referred for further evaluation. About 9,145 (86.9% of referrals) children and all 3,121 teachers presented at the various schools and communities for comprehensive eye examination by specialist eye care team.

Different eye care teams made up of an average of 8 members (2 ophthalmologists, 2 resident doctors, 2 nurses, 1 optometrist, 1 support staff) with a mix of critical skills to deliver child eye care supported by 6 school/community volunteers who provided the on-site school/community-based comprehensive eye evaluation (Figure-1) over a cumulative 23 days.

Among those who had vision screening, prevalence of refractive errors was found among 2.4% and

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**Figure 1:** Typical flow of Comprehensive eye examination in schools and communities
3.1% rural and urban children in regular schools/communities respectively. It was 6.3% among those with special needs. About 60% had same day on-site delivery of ready-made eye glasses and medical treatment mostly for vernal keratoconjunctivitis (48%) and ocular surface infections was provided during the onsite comprehensive eye evaluation. Hospital referrals were made only for those conditions that required surgery and long-term care such as glaucoma-23%, ptosis-4.6%, cataract-3.5%, strabismus-5.4%. About 13% of referred children had normal eyes. High blood pressure was found in about 32% of teachers older than 40 years.

**Conclusion:** Accessible, scalable, timely, and cost-effective large scale vision care for children provided the much-needed child eye health promotion and services in our low-resourced settings. It used a strategy that was child eyecare focused, school/community based and anchored on task-shifting for vision screening, easy to use TELVIS kits, expert level comprehensive follow-up eye evaluation, with digital equipment, and good organization. It is therefore recommended for similar environments.

**Keywords:** Community based, Strategies, Child eye services, Continuum of care, Task shifting.

**References**

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