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EDITORIAL: POST COVID-19, TESTING TIMES.

Tubonye C. Harry, FRCOG, FRCP, FWACS
Editor-in-Chief

Niger Delta Medical Journal 2020;**4**(2):5-6

The decade began with the novel coronavirus 1 (2019-nCov) identified in Hubei, Wuhan District, China. The first case reported in Nigeria[2] on the 27th February 2020 was on an Italian citizen who worked in Nigeria and had returned from Milan, Italy to Lagos on the 25th February 2020. The World Health Organization (WHO) on 11th March 2020, declared the novel coronavirus (COVID-19) outbreak a global pandemic[3].

In this issue, we have guest editorial[4]on the COVID-19 pandemic contributed by Prof Edmund Ong, under whom I trained from 1992-1996, during my Infectious Diseases placement on the Northern Regional Higher Medical Training Programme in Genitourinary & HIV Medicine in United Kingdom.

We sadly have a tribute[5] for the first Radiologist to succumb to the COVID-19 in Nigeria and the West African sub-region by Prof Donald Nzeh.
Town and gown entails engaging our local communities[6] for wellness, particularly in the present climes, as espoused by Emeritus Prof Briggs. Pregnancy being complicated by glaucoma is rare, but nevertheless when it occur, we need to be aware of the challenges as discussed[7].

We need to benchmark normal baseline creatinine and urea parameters[8] for our catchment population; healthy Niger Delta subjects as demonstrably done. Audit is the basis for service improvement and assessing adequate funding. Our dental colleagues evaluate dental planning[9] in Port Harcourt.
Primary amenorrhea should always be investigated timely by specialist units in a multidisciplinary team approach to avert unnecessary angst[10] as elegantly demonstrated in this case report.

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Akinlemibola. *Nig Del Med* J 2020; **4**(2) 14.

6. Briggs ND. Invited Lecture: AKULGA keeping healthy rather than treating disease.*Nig Del Med* J 2020; **4** (2) 15-19.
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COVID-19 RESPONSES: PREPAREDNESS ALONG WITH TRACE, TEST AND TREAT AND A ROBUST CONTAINMENT POLICY IS KEY IN RESOURCE LIMITED SETTINGS

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Prof Edmund Ong is presently seconded from Newcastle University and Royal Victoria Infirmary where he is a Consultant Physician in Infectious Diseases and General Medicine, UK to the Malaysian campus in Johor Bharu. He has experienced the lockdown measures implemented as a Movement Control Order in Malaysia first hand as a clinician, academic lecturer and researcher.

COVID-19 Responses: Preparedness along with trace, test and treat and a robust containment policy is key in resource limited settings.

In December 2019, a series of pneumonia cases of unknown cause emerged in Wuhan, Hubei, China, with clinical presentations resembling viral pneumonia.Deep sequencing analysis from lower respiratory tract samples indicated a novel coronavirus, which was named 2019 novel coronavirus (2019-nCoV)[1]. Human coronaviruses, including hCoV-229E, OC43, NL63, and HKU1, cause mild respiratory diseases. Fatal coronavirus infections that have emerged in the past two decades are severe acute respiratory syndrome coronavirus (SARS-CoV) and the Middle East respiratory syndrome coronavirus. At the time of writing this review 21st June 2020, there have been over 8.8 million reported cases globally with 464,952 deaths[2]. These cases are dominated from United States, Brazil, Russia, India and UK. (Fig 1) This observation has challenged the notion that expertise in the West

with a well-developed and funded healthcare systems deliver better outcomes in survival and containment of outbreaks in infectious diseases[3]. Countries in the Far East like Taiwan, South Korea, Vietnam and Malaysia have shown innovative and rapid pandemic responses that are different in key areas and have kept infections and deaths relatively low compared to the West. One of these countries is Malaysia. As a middle-income country with a population of 32 million people, it has a record in a number of public health achievements – eliminating mother-to-child transmission of HIV and syphilis[4]. and granting access to the use of

generic Hepatitis C drugs to treat the emerging HCV infected "hard to reach" population including those co-infected with HIV with the aim of elimination[5].

Planning and preparedness started when reports of clinical cases were reported in China both in the popular media and medical literature, including coordination with public health teams, plans for renovation of hospitals for surge capacity, and plans for procurement of laboratory and medical equipments including ventilators.

Previous experience with MERS and the 2002-2003 severe acute respiratory syndrome (SARS) epidemic, and the Nipah Virus outbreak (1998-1999) with the expertise of experienced contact tracing teams was key in enabling such a rapid response.
Planning and preparedness activities started in December 2019, diagnostic reagents procurement in January 2020, and a number of renovations to hospital facilities done in February 2020. In the West, the EU had made an announcement that they would assist countries in the EU in COVID-19 joint procurement schemes on 31st January 2020, with countries in the EU being at various stages of procurement for both protective and medical gear in April 2020[6].

Optimising diagnostics capacity was undertaken within both public and private laboratories. Laboratories within the Institute for Medical Research (IMR), the biomedical research arm of the Ministry of Health collaborated with interested parties resulting in an 86% increment in diagnostic laboratories. A joint effort was initiated between the Ministry of Higher Education (MOHE – in charge of university hospitals) and the Ministry of Science, Technology, and Innovation (MOSTI) to mobilise 10 university labs as well as an additional lab at the Malaysian Genome Institute under MOSTI. This meant that diagnostics capacity for COVID-19 increased from an initial 6 laboratories to 43 laboratories including those in public hospitals, public health laboratories, IMR, both public and private university laboratories, laboratories within the Malaysian Armed Forces, the Malaysian Genome Institute, and private laboratories managed by independent hospitals.

The first series of cases of COVID-19 cases imported to Malaysia started when eight Chinese nationals entered Malaysia on 23rd January 2020 via Johor Bahru on Malaysia's Southern border with Singapore. This group of travellers had been holidaying in Singapore and were close contacts with a proven COVID-19 index case who was admitted acutely ill to a Singapore hospital. All eight were tested for COVID-19. On 25th January 2020, a public announcement was made that three of these individuals had tested positive for COVID-19 and had already entered Malaysia on a holiday tour. Malaysia subsequently recorded 22 cases in January 2020, all of which were imported cases[7]. On 26 January 2020, the Ministry of Health (MOH) advised Malaysians to avoid travelling to China unless it was essential travel. Cases in February 2020 were largely imported cases. On 9th March 2020, health officials from Brunei Darussalam alerted MOH, Malaysia about a positive COVID-19 case diagnosed in their country who had just returned from Malaysia after attending an annual mass religious assembly at Seri Petaling Mosque, Kuala Lumpur which was held between 27th February to 1st March 2020 involving more than 14,500 local and 1,500 international attendees[8]. By mid-March, more than half of Malaysia's 673 confirmed cases were linked to this mass religious event.

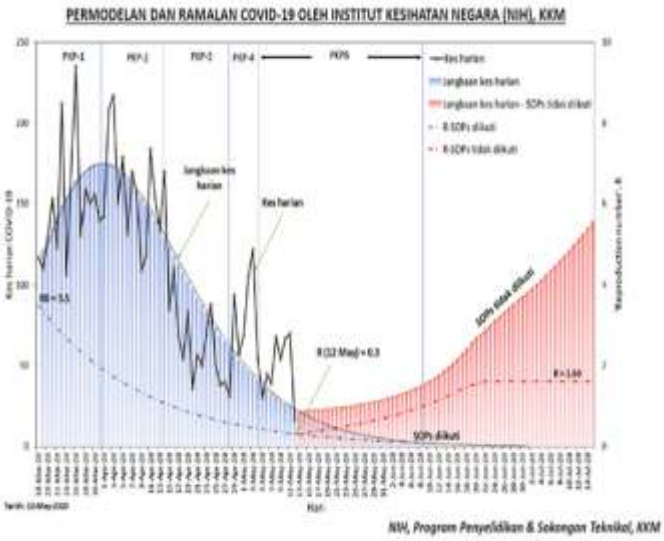
On 11th March 2020, the WHO declared the COVID-19 outbreak as a pandemic. On 12th March 2020, the government made the decision to designate Sungai Buloh Hospital, a public hospital approximately 25kms northwest of Kuala Lumpur, as the country's main COVID-19 hospital. It has the largest Infectious Department and facilities for isolation in Malaysia[9].

The number of hospitals treating COVID-19 patients was subsequently increased from 26 hospitals to 40 hospitals including 7 which function as full COVID-19 hospitals in the key states of Malaysia ; along with the number of screening hospitals from 56 to 120 in all states within Malaysia.

Following the substantial number of COVID-19 cases reported following the religious gathering in Sri Petaling, the Government of Malaysia made the decision to implement a legal Movement Control Order (MCO) nationwide, beginning from 18th March 2020. This MCO is equivalent to what many other countries would describe as a "lockdown".

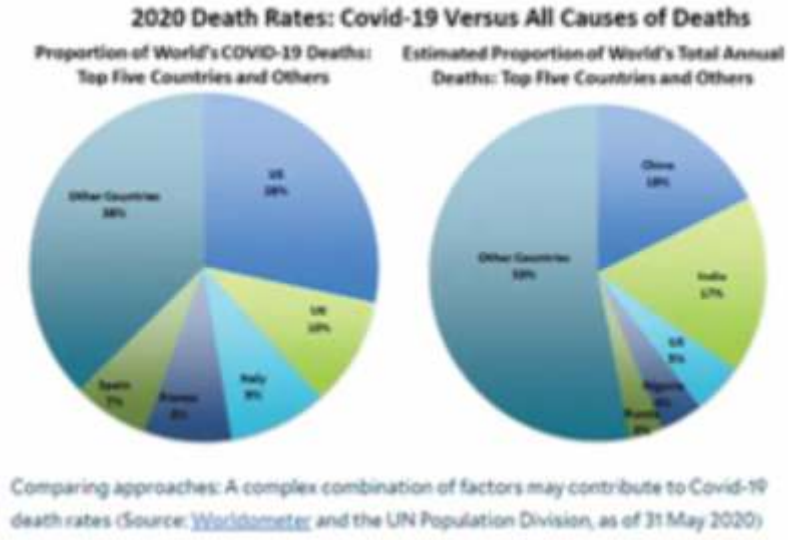
The Government declared the first MCO from 18th March 2020 to 31st March 2020. The government then extended the second MCO period from 1st April 2020 to 14th April 2020, the third MCO from 15th April to 28th April and the fourth stage MCO from 29th April to 12th May 2020 based on current clusters and the dynamics of transmission of cases with the objective to curb the spread of the COVID-19 infection. The government has also announced the conditional MCO from 4th May 2020 to 9th June 2020, and has now extended to recovery MCO from 10th June 2020 to 31st August 2020 allowing certain part of the employment sectors to operate in compliance with SOP issued by relevant governmental agencies and travel between states permitted.

At the start of the 1st MCO; the National Institute of Health Malaysia calculated the R_0Index to be around 3.5 and at 12th May (Figure 2); this has reduced to 0.3 showing the effect of the MCO with the other public health measures including *social distancing, advocating the wearing of face masks in public spaces, contact tracing, frequent hand-washing.*

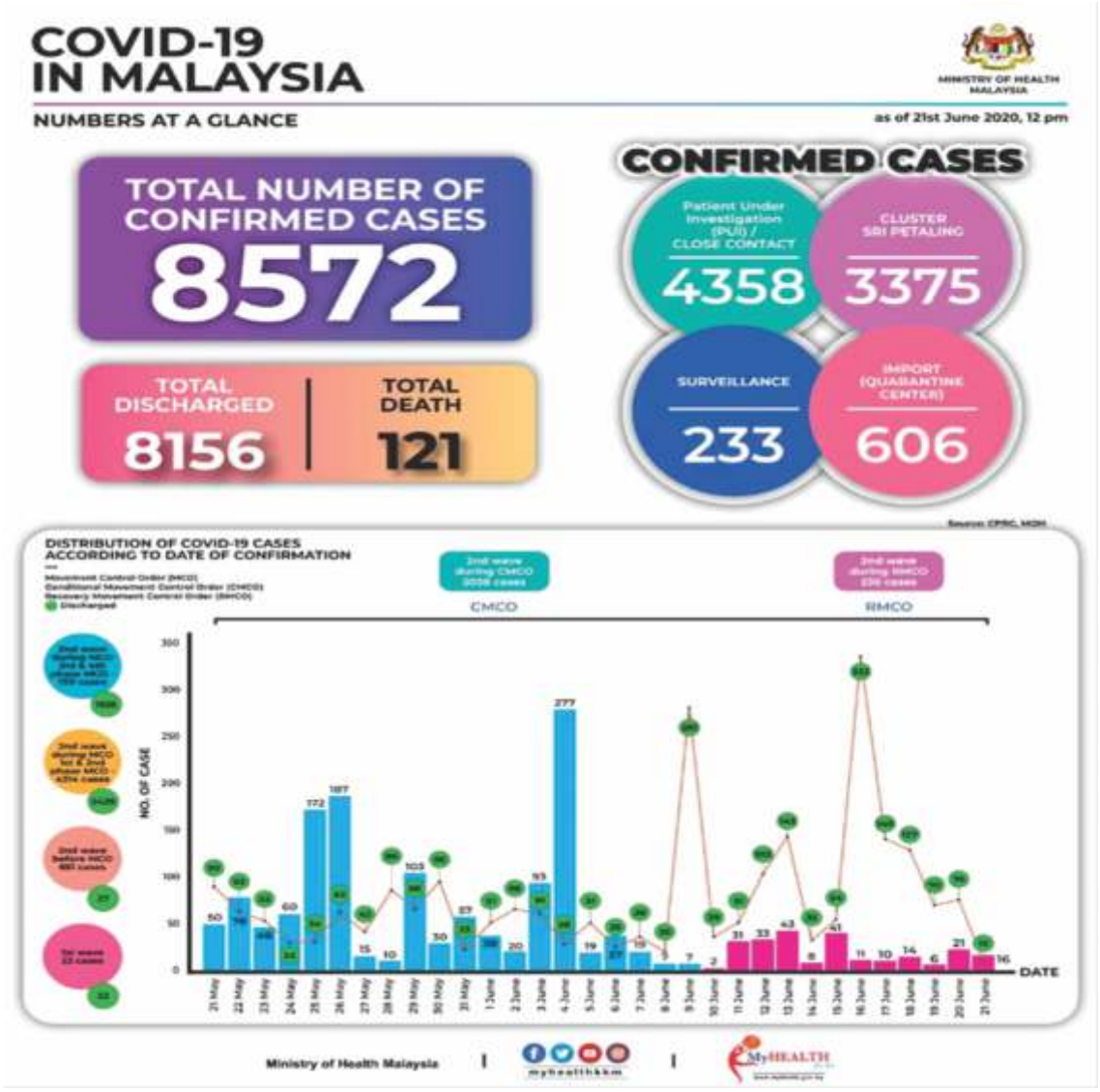


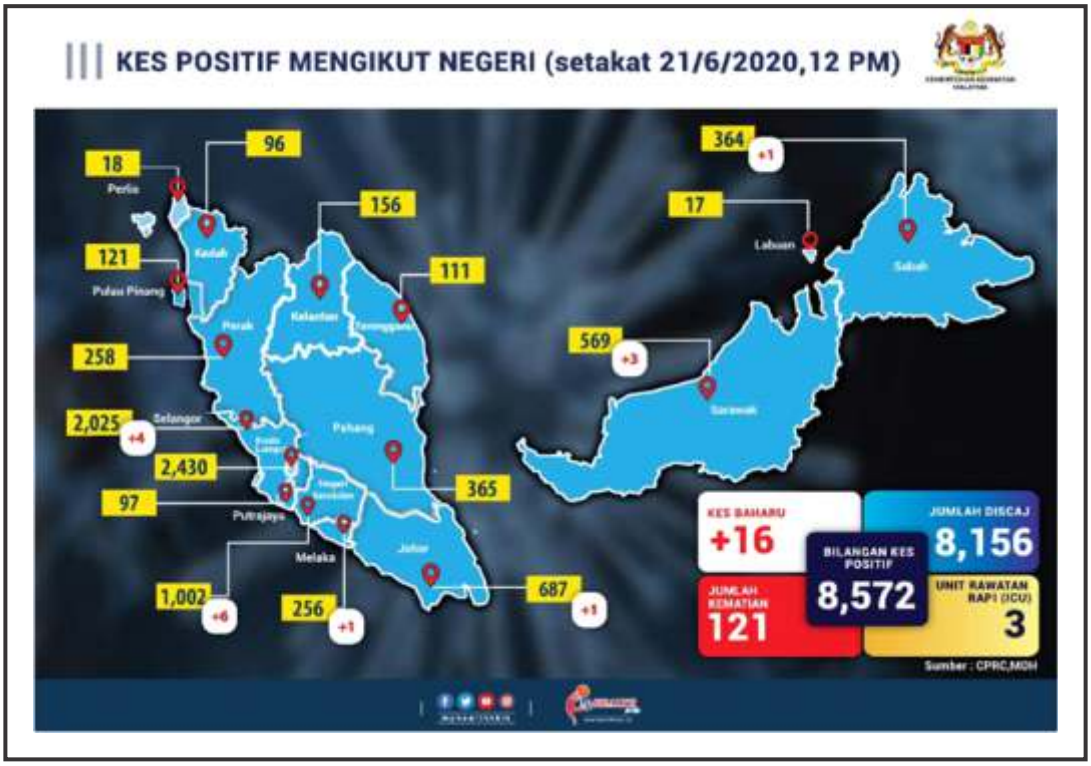
In contrast to countries in the West, Malaysia hospitalised all individuals diagnosed as COVID-19 positive, including asymptomatic patients and individuals who have reported close contacts with confirmed COVID-19 cases, or with travel history to high burden areas. All patients with COVID-19 were monitored closely and be given appropriate treatment

when warranted. Patients Under Investigation (PUI) with close contact or travel history and SARI were also admitted. The objective of admitting these patients is to rule out COVID-19 infection. A standard clerking format was used to ensure key clinical data are recorded. Close monitoring on a daily basis identifying patients who may deteriorate and medical interventions were instituted promptly. Such interventions may have contributed to the low mortality rate. Socio-demographic factors such as having an overall younger population than countries in the West would be one of the contributing factors. The aggressiveness of isolation and quarantine actions would have an impact on the transmission dynamics.



Daily updates were released by the MOH to the media on various platforms chaired by the Director General of the MOH as highlighted below



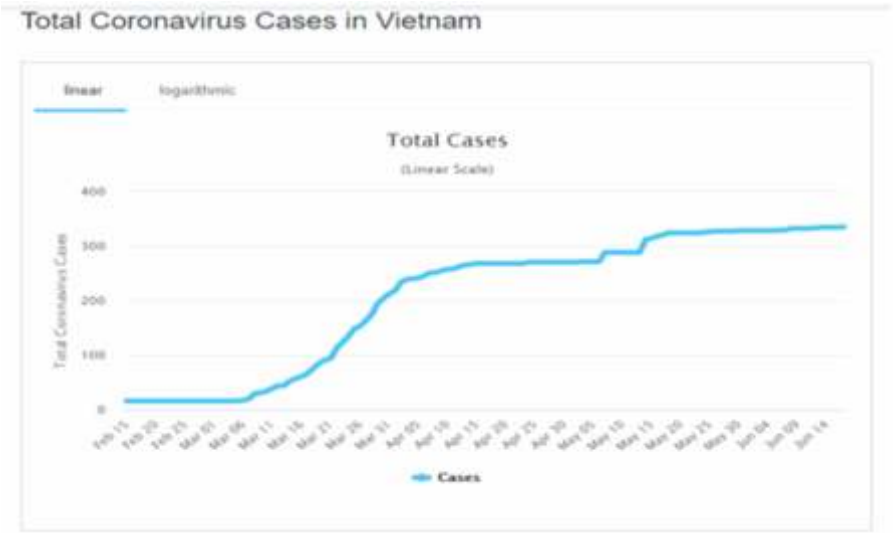


Contact tracing as a method to control infections was evident throughout Malaysia's COVID-19 response. Malaysia's Public Health System is used to regular dengue, tuberculosis outbreaks that require contact tracing algorithm.

This success was also reflected in a number of other countries in the Far East, including Taiwan, South Korea, and Vietnam, challenging the belief that health security, expertise, and robust health systems were concentrated in the West. It would be timely to review and assess on what criteria the 2019 Global Health Security Index was based on as it ranks the United States and the United Kingdom first and second in terms of global health security but these two countries are in the top 5 reporting COVID-19 deathspresently in mid-June 2020[10].

Vietnam, a lower-middle income country, did not have the diagnostics capacity to deal with such an outbreak. It began initiating responses earlier in January 2020, with strict containment measures which significantly reduced the spread of the epidemic in the country. This was achieved through the use of emergency control measures in the epidemic areas and integration of resources from multiple sectors including health, mass media, transportation, education, public affairs, and defense[11]. Border control measures such as temperature screening, and extended contact tracing (where once a positive case was identified, contacts through five generations were traced) were implemented early[12]. A nation of around 95 million population, Vietnam confirmed its first COVID-19 case on Jan. 23. However, it has so far reported 328 cases with zero deaths and 307 recoveries. The country has 1,450 kilometers (900 miles) of land border with China. This developing country—lacking Singapore or South Korea's resources—has tested more than 210,000 samples. That is a moderate number in relation to its population but high in the context of the size of its outbreak.

Vietnam has conducted more than 780 tests per confirmed case, a higher figure than New Zealand or Taiwan, showing a vast proportion of its tests are coming back negative. Malaysia on the other hand undertook targeted screening in specific groups including attendees at Seri PetalingReligious Assembly, Tahfiz/ / Madrasah Center and Depot Home Immigration Centres where initial clusters of cases have occurred. Travellers from overseas had to undergo COVID-19 testing either prior to entry or at ports of entry. In addition, a strict 14 dayquarantine measures in approved facilities was part of the condition on entry.



Malaysia largely had similar responses and with quicker responses relative to the Global North. Taiwan and South Korea have the testing capacity and a well resourced health care system and a robust public health infrastructure that responded promptly contributing to its success to the control of the pandemic.

The early preparedness, robust contact tracing teams, diagnostics capacity and efficiency, treatment teams that worked on the current prevailingpublic health surveillance data and resources with strict lockdown measures are key to the relative success of the response. It also highlights the importance of a publicly funded health system to ensure testing and treatment for all without any discrimination of immigration status.

These examples of countries which mount a coordinated and comprehensive response in a pandemic requires an effective public funded health systemcapable of responding promptly and timely. Effective communication and multi-disciplinary team working is key in pandemic response.

In summary, Malaysia's and Vietnam's relative success is attributable to a combination of early preparedness and planning, experiences in previous pandemics, diagnostics, public health system, contact tracing, and a strict lockdown.

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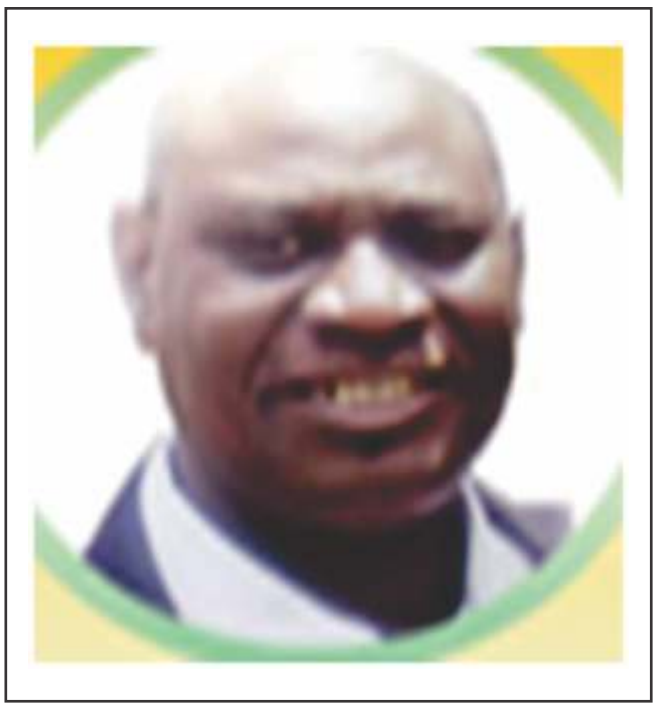
A RADIOLOGIST IN NIGERIA, WEST AFRICA SUCCUMBS TO THE COVID-19 PANDEMIC.

Tribute to Dr Julius KolawoleAkinlemibola
(5th May 1957 – 27th April 2020)



I received with deep sadness the news of the death of Dr Kola Akinlemibola. He became the first radiologist in the West African sub region to die of the novel coronavirus (2019-nCov). He was aged 62 years.

After his undergraduate education at the College of Medicine University of Lagos in 1980 he joined our department at the University of Ilorin Teaching Hospital for residency training 1990 - 1995. During the period of his residency programme, he was Chairman of the local chapter of the Association of Resident Doctors in UITH, Ilorin in 1992.

He qualified as a radiologist with Fellowship of the West African College of Surgeons (FWACS) in 1996. Throughout his career in Public Service he worked as a Consultant Radiologist for the Lagos State Government at the General Hospitals, first in Marina in 1996 and later in Gbagada until his retirement in 2018.

Kola was an urbane, debonair, self-effacing and detribalized Nigerian who pursued his convictions with quiet determination. He was a dependable colleague who stood by his words.

His long sojourn in Lagos did not detach him from his roots in Ile-Oluji, Ondo State where he continued to relate with his homestead and contributed to community development.

I pray that Almighty God will give his family members the fortitude to bear this irreparable loss.

May his gentle soul rest peacefully in the bosom of the Lord. Adieu to a dear colleague.

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KEEPING HEALTHY RATHER TREATING DISEASES

A MEDICAL TALK

By
Nimi Dimkpa Briggs

DELIVERED AS PART OF THE 2015 CONFERENCE ON PEACE AND DEVELOPMENT HELD BY THE AKUKU TORU LOCAL GOVERNMENT AREA COUNCIL OF TRADITIONAL RULERS AND CHIEFS ABONNEMA.
Saturday, 19th December 2015.

Gathered in this town square today is an epic assemblage of the people of Abonnema (Nyemoni), Obonnoma, Abissa, Soku, Sangama, Kula, Idama, Belema and Offionama. They are here as constituent parts of the Akuku Toru Local Government Area created in 1991 by the Federal Government of Nigeria to foster and fast-track grassroots development. All extractions of the Kalabari nation, the people of AKULGA have lived their lives in brotherhood and harmony for decades on the shores and tributaries of the Sombriero River, which they affectionately call *Akuku Toru* and as expected, they are all led to this venue by their most revered traditional rulers with the Amayanabo of Abonnema, HRM king Gbobo Disreal Bobmanuel II, Owukori IX as Chairman in Council. My first assignment therefore is to thank the Chairman in Council, our highly respected traditional rulers, our mothers and fathers, very distinguished ladies and gentlemen, youths and even the children who are congregated here for giving me the opportunity to speak at such an outstanding occasion. For me, the recognition is momentous as it situates me squarely where I truly belong – a true breed of Nyemoni, the *York City* of Nigeria.

My understanding of the request by the AKULGA Council of Traditional Rulers to me *to give AMedical Talk* at this event is that I should examine some health issues concerning our people. And here I will commence by drawing attention to the fact that health, in its widest sense, is beyond the mere absence of disease as, in reality, it connotes complete physical and mental wellbeing. Thus, being healthy is fundamental for our happiness, and a prerequisite for our ability to pursue our individual and collective aspirations as well as being able to meaningfully contribute to our personal, family, community and national progress and development. Therefore, as health is of such prime significance in all that we do, it is not surprising that it is not only hospitals, clinics, pills or even the much vaunted injections and drips – some of our cherished traditional portals of health, that, as important as they are, keep us healthy. Indeed, a whole gamut of many other things do: the environment in which we live, the life styles we pass, the food we eat, the quality of the air we breathe, what we drink and much more. So, just as doctors, nurses and other health workers are trained to look after our health, we as individuals, families and communities also have some responsibility to ensure we stay healthy. In the same vein, it is not only activities in the health sector – hospitals, clinics, surgeries - that determine our state of health; those in many other sectors such as water resources, nutrition, sanitation, transportation, trade, and others also exert substantial influence.

Thus, effective contribution to health is derived from many sectors from which knowledge, skills, competences, and resources are harnessed and deployed. It is such sectoral collaboration that best assures the health of a people.

This fact of collective responsibility for health and wellbeing is not lost on good leaders – such leaders play their part and encourage others to do theirs also, their actions being at all times underpinned by a desire to achieve this goal. Let us by way of illustration examine what our forebears did when they founded this island in 1882 which became the great city of Abonnema, the capital of our Local Government Area.

Realising that nothing good, including health, thrives in the presence of chaos and disorder, their initial actions on arrival here, were to establish order and precept through functional spatial organisation. The entire island was divided into compounds called *polo*, where the paramount chief of each war canoe house from the old shipment as it was then known, his other chiefs and their entire households lived. A Street constructed from one end of the island to the other connected all *polos* while some parcels of the land were set aside for merchandising, communal meetings and recreational activities. Furthermore, each *polo* had at least one properly dug, deep well to provide potable water to which everyone had free access. *Polos* were subdivided into *ogigos* which were constructed in modular fashions for the accommodation of individual families. There were also subsidiary open fields in each *polo* which served as additional playgrounds and places for meetings. Besides, most *ogigos* also had their own wells.

To have succeeded in putting such a virgin land, as it then was, into a distinctive functional order which, till this day, is of prime importance to the operations of society without a formal knowledge of geography and urban planning is an outstanding feat of statesmanship and an immense contribution to the development priorities of a people. For health, it meant that water was available to support life: for drinking, domestic functions and personal hygiene. Modular replication of residential accommodation as well as open fields for recreational activities made environmental sanitation easy, enhanced communal interactions and offered children the opportunity to engage in outdoor plays and recreation even at night - an important component needed for their healthy growth. The *ogigo* arrangement made supervision of the health of individual family members by respective *ogigo* heads possible. It also served as a precursor to some form of family specialisation in different aspects of health care – notable ones being in the areas of trauma especially sores and other exposed injuries, supervision of pregnancies and deliveries and the care of mentally ill patients. Thus, family heads were obligated to seek help from *experts* and persons in neighbouring *ogigos* when necessary. Furthermore, food items including much needed fruits and vegetables could be purchased from a central market which held at designated times while subsistence farming in the backyards of various *ogigos* boosted the available fresh fruits and vegetables for family consumption. It is conceivable that the other towns and villages in the LGA were developed in similar manner.

It is tempting to downplay or take for granted the impact of such effective social order on health. However, the point has to be made that a foundation that defines hierarchy as well as levels of responsibility and encourages peaceful coexistence of people in communes,

is imperative for the establishment of an integrated care system that would cover all aspects of health including those that would address matters relating to specific disease conditions as we know them today.

This structured arrangement - a masterly display of native intelligence, on which the health system was based, met the needs of our forebears at the time. It was foundational and so needed to be improved upon with time. However, it is difficult to argue that much has changed over these 100 years and beyond. Most of us still defecate directly and throw our refuge into the same river and swamps in which we bathe, catch fish and harvest other aquatic food items – *isam, mgbe, ngolo, oporo* - which constitute our major sources of protein as did our forebears. Often, we kill fish with dynamites and disperse dangerous chemicals which poison marine life and by extension, ours. Wells, from which many of us still obtain our drinking water are often left uncovered and exposed to the elements and so, they become homes for cockroaches and rodents. Children occasionally fall into them. Some of us abandon the designated burial ground and even bury our dead ones close to these sources of drinking water. Furthermore, drainages that are designed to channel effluents from our various *polos* and homes into the river are never cleaned but left to be permanently blocked with all manner of filth including faeces from humans and domestic animals. A visit to the big drainage at the back of *BOP* between *Oruwariand Iju polo* will drive home this point. So also will a walk along the sea shore from *Owusara* to *Nyemoni Mission* reveal the extent to which our river has been polluted by plastics and other waste materials with poor biodegradable properties. We have desecrated the land with huge fires set up for *cooking* petroleum products, euphemistically called *kpofire* with all its attendant negative health consequences. Your Majesty and our respected Traditional Rulers, so strong has the degradation of the environment been that on the whole, what comes through is that in the past 100 years or so, we, Akulgans, have conducted our affairs and deployed the land in such a manner that it is now less able to support our health and well-being as it did in its pristine form with our forbearers.

Herein then lies our path of action and the three things we as a people, especially our younger ones need to do – more as a way of keeping healthy than as one for treating diseases. First; we are to take some responsibility for our own good health in the way we live and the things we do. Second; we should take steps to protect the environment so as to make it a healthy environment and one that will better support a healthy way of life and our happiness. Third; we have to establish and create better access to functional, quality, scientific modern health care for all our people that would address the preventive, curative and promotive aspects of health and well-being to ensure freedom from disease and longevity. These issues do not operate in isolation but I will speak to them in my concluding comments as if they do.

Life style patterns are key determinants to health outcomes. A balanced and nutritious diet, with emphasis on fresh fruits and vegetables and fish as the main source of protein as well as a number of other personal life choices are usually advocated. Of these, heavy alcohol intake and lack of physical exercises would appear most germane to this great assembly. While available information confirms that alcohol in moderation is of some benefit to health, taken in excess, the drink could cause a number of deadly diseases let alone the dehumanization and stupor it causes its addicts.

In this respect, we all have to reconsider the large volumes of alcohol and spirits that are consumed in this town of Abonnema and probably other parts of the LGA especially at various functions or as part of the weekly process of socializing. The massive presence of *Okada* and other motorized vehicles in town have lured many away from the traditional long walks our people took, with all their health benefits, to market places, schools, entertainment sites, compounds other than theirs for visits and socializing. I drew attention to this possibility when I addressed the chiefs and peoples of Abonnema at the turn of the millennium on the consequences of the Degema – Abonnema Bridge which was then under construction. The result is that many people you see in our various compounds and *ogigos* do not look well. They can hardly walk a couple of yards without being short of breath and are often unable to do simple things for themselves. But we can help ourselves even in a little way. Cut down on the amount of alcohol we consume, make walking part of our life style and try to eat as healthily as we possibly can.

The deterioration in the environment is of serious concern. While it may be true that our current level of national development precludes us from suitably tackling some of the issues I raised, such as providing a central sewage system where all our body effluents would be properly treated before discharging into the sea, we can at least do something. Reactivating the Scan Water System of Abonnema that has remained moribund for decades will ensure the availability of pipe borne water that is of better quality than the well water which most of us still use. Communal cleaning of the environment, as used to be ordered by paramount chiefs, when I was a kid in Abonnema, could be resuscitated. And efforts could be made to discourage everyone from engaging in illicit refining of petroleum products in our backyards and farmlands.

On the third and last matter of modern health services, many would agree that the services, as they currently are, are flimsy and rudimentary despite the large number of highly trained health professionals that Abonnema alone has produced – some with global acclaim. The services constitute a very far cry from what obtained in the 50s and 60s when the General Hospital, Degema, alone offered highly professional and efficient services to patients in the whole of Kalabari land and beyond. Indeed, those were the good old days. For now, the General Hospital Abonnema functions in fits and starts, the Primary Health Care centres in Abonnema and Obonoma are hardly patronised; many say they have not earned their trust as sanitation is poor, drugs, out of stock and attitude of some medical staff, repulsive. But we cannot accept this as a people. We must assist government to make these health institutions function properly and use them for the care of all but especially for maternal and child health services for our women and children. Before I take my seat, let me be the first to accept that poverty is a major factor behind a number of the obnoxious actions to which I have drawn attention which compromise the health of our people. For several reasons, the poor fall ill more often than those who can adequately take care of their daily needs and when they do, their path to rectitude is arduous and less assured. Per capita income here must be among the least anywhere despite our rich resources. Many *ogigos* of 40 -50 persons have just one revenue earner; a good number, none. The palm produce and timber trade which buoyed our forebears have all but disappeared while the hydrocarbon in the belly of our land is beyond

our reach. Hunger is real in this land. The drift to Port Harcourt and other places occasioned by this lack of gainful employment in our land is bad for our health, social formation and way of life and has to be addressed. Your Majesty; this should preoccupy all of us. Form a Think Tank of men and women with business acumen and charge its members with the responsibility of exploring viable options for bringing employment opportunities into AKULGA. Here, dare I ask, is it not time we as a people matched once again to the State and Federal Authorities, this time demanding that the seaport at Abonnema, now capital of Akuku Toru Local Government Area, be reopened?

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COMMENTARY: GLAUCOMA MEDICATIONS IN PREGNANCY AND BREAST-FEEDING MOTHERS.

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Glaucoma is a chronic, progressive, and irreversible optic neuropathy which is associated with a characteristic loss of optic nerve fibres, visual field changes and raised intraocular pressure. Raised intraocular pressure is the only modifiable risk factor presently. Therefore treatment regimens are aimed at reducing the intraocular pressure. The drugs used in pregnant women may thus, have adverse effects on pregnancy, and the newborn. There is therefore the need to study their safety in pregnancy and nursing mothers.

New diagnosis of glaucoma during pregnancy is rare, however the prevalence of glaucoma in pregnancy is about 2-3% in women over 40 years of age.[1] Glaucoma under 40 years, which is the reproductive period of females falls under juvenile onset glaucoma, primary congenital glaucoma and secondary glaucoma which can either be congenital or acquired.

Weil Marchesani syndrome, iris naevus syndrome and spherophakia fall under secondary congenital type of glaucoma while aphakic glaucoma is an example of secondary acquired glaucoma.

Approximately 3% of women on glaucoma drugs will bear children with an abnormality by chance alone, because major organ systems develop early in the embryo; a woman on medications would have been exposed to the drugs before the patient is aware that she is pregnant[2].

The treatment of glaucoma in pregnancy offers the unique challenge of balancing the risk of vision loss to the mother, against the potential harm to the foetus or new born. The widely used glaucoma medications include B blocking agents, alpha adrenoceptor agonists, carbonic anhydrase inhibitors such as acetazolamide and prostaglandin analogues such as *Latanoprost* and *Bimatoprost.*

The Food and drug administration (FDA) of the United States of America, classifies drugs used in pregnancy into categories of safety ranging from A to D as defined below:.

Category A: Includes drugs in which adequate and well controlled studies have failed to demonstrate risk to the foetus in the 1st trimester of pregnancy.

Category B: Animal reproduction studies have failed to demonstrate a risk to the foetus and there are no adequate and well controlled studies in pregnant women.

Category C: Animal reproduction studies have shown an adverse effect on the foetus and there are no adequate and well controlled studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.

Category D: There is positive evidence of human foetal risk based on adverse reaction data from investigational or marketing experience or studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks. Glaucoma medications are mainly in groups B and C. All anti-glaucoma drugs are of low molecular weight and are lipid soluble, unbound and are not ionized; thus they cross the placenta into the foetal circulatorysystem.
Razeghinejad et al[2,3] did not find any adverse effects in mothers taking anti-glaucoma drugs, apart from a risk of low birth weight in babies born to these patients.

As a general recommendation, topical forms of anti-glaucoma medication are preferred especially gel formulations in other to reduce side effects. The patient should also be advised to use one drop only on each application and then applying digital pressure over the medial part of the lower eyelid or gently closing the eyelids for 1 or 2 minutes to minimize systemic drug absorption.

There are also treatment options not involving medication, which the ophthalmic surgeon may consider, such as Argon Laser trabeculoplasty or Selective Laser trabeculoplasty and these can be done at any stage of pregnancy on an outpatient clinic basis. These surgical procedures may involve use of postoperative drugs. Surgical intervention such as trabeculectomy may be considered but again post-operative medications may be required. Glaucoma medications include the various classes enumerated with their mode of actions and limitations. Table 1 and 2 summarises the principal concerns.

Pilocarpine: Category C: These act on smooth muscle and glandular receptors innervated by post-ganglionic cholinergic nerves. In the management of glaucoma, they are used in doses of 1%, 2%, 3% and 4%, depending on the severity of the rise in pressure[4]. The slow release versions such as *Pilo-20* and *Pilo-40* are considered much safer to use and therefore preferable. They act by increasing the outflow of aqueous humour through the trabecular meshwork. Systemic complication or toxicity is rare and they are considered safe in pregnancy and in nursing mothers that are breast feeding because they do not traverse membranes very well.

Alpha adreno-receptors: Category B:
Brimonidine is a selective alpha-2 adrenergic agent, along with *Apraclonidine*. It reduces intra ocular pressure by decreasing aqueous production and increasing the uveo-scleral outflow of aqueous[4]. It is available as 0.2% solution. When used as the only treatment is dosed three times daily, but if used in combination with other medications is usually instilled twice daily.

It crosses the placenta and could potentially cause apnoea in neonates if used during parturition by the mother. *Brimonidine* is considered relatively safe to use in pregnancy[4,5]. The drug penetrates the hematoencephallic blood-brain barrier, and can cross the hemato-placental barrier and possibly excrete into breast milk, posing a real risk of apnea or hypotension in neonates and infants. Thus, despite its status of being a category B drug, if it is used during pregnancy, it should be discontinued before labor and during breastfeeding to prevent potential fetal apnea[6,7].

Prostaglandin Analogues: Category C: Prostaglandin analogues such as *Latanoprost, Bimatoprost, Travoprost and Tafluprost* reduce IOP by increasing the uveo-scleral outflow of aqueous humour but they are contra-indicated in pregnancy and breast feeding because they may induce spontaneous abortions and bleeding. *Latanoprost* is a pro drug of prostaglandin F2-alpha. It also has direct effect on the FP receptors, which produces structural modification of the extracellular matrix of the ciliary muscle, thereby increasing permeability, which in turn lowers intraocular pressure[8]. *Bimatoprost* works in a slightly different way. It works via a prostamide sensitive receptor and increases both uveo-scleral and conventional outflow of aqueous[8].

Prostaglandins, being oxytocic and luteolytic, can increase uterine tone and stimulate uterine contractions producing premature labor. Since they may act as abortifacients, there are concerns regarding their use in pregnancy. In
fact, *Travoprost* is a prodrug that will hydrolyse in the cornea to become fluprostenol a type of prostaglandin that is highly selective for F2α receptors, which is used to induce abortion in animals by causing uterine smooth muscle contractions[9-12].

B-blockers: Category C: These bind to B-adreneceptor receptors, blocking sympathetic transmission. They reduce aqueous production and are mostly non-cardio selective. B blocking agents decrease the production of aqueous humour and subsequently lower the intra-ocular pressure, but can cause respiratory distress and apneoa following in utero exposure.

The commonest agent used is in managing glaucoma is *Timolol.* They are prescribed as 0.25% or 0.5% strength eye drops in glaucoma patients. There is also a long acting Timolol eye gel with a 24 hours duration of action, usually administered in the mornings. Respiratory distress and apnoea have been reported following in utero exposure. The data on the safety of discontinuing treatment 24-48h before delivery are conflicting[2,13]. When reported, neonatal symptoms due to β-blockade are usually mild and resolve within two days. *Timolol* is excreted in breast milk also, although the concentration is one eightieth the cardio effective dose. Ordinarily this level of *Timolol*, should not cause concern, unless the infant's hepatic or renal function is impaired.

Nevertheless, the baby should be monitored for signs of beta-blockade. The lactating baby may also develop bradycardia, and hypotension. Ironically the obstetricians use beta blocking agents such as Labetalol to manage hypertension in pregnancy albeit for a short period, compared to beta blocking agent usage in managing glaucoma. Wagenvoort et al[17] described bradycardia in a healthy foetus at 34 weeks gestation whose mother received topical *Timolol* at a dose of 0.5% ; the foetal heart rate improved when the dose of Timolol was reduced from 0.5% to 0.25%. No other reports abound in the literature of foetal complications such as low birth weight or teratogenicity.

Carbonic anhydrase inhibitors: Category C: These are very useful in management of glaucoma which act by reducing aqueous humour production in the human eye; by inhibiting the enzyme carbonic anhydrase. This enzyme catalyses the reversible reaction, $C0_2$ + H_20 = H_2C0_3. Carbonic anhydrase inhibitors (CAIs) are effective IOP-lowering agents. CAIs reduce IOP by suppressing aqueous humor production through inhibition of the isoenzyme carbonic anhydrase II in the ciliary body. *Acetazolamide* may result in potential metabolic complications in the newborn or breast-feeding child.The oral form called *Acetazolamide* is given in doses of 250mg four times daily. The topical forms are *Dorzolamide* 2% or *Brinzolamide* and areadministered twice daily. Experimental mice have shown teratogenic effects from carbonic anhydrase inhibitors[15]. Also a pregnant woman who received oral *Acetazolamide* over 3 days at 34 weeks gestation

due to foetal distress; the newborn was later shown to have renal tubular acidosis, and measurable levels of Acetazolamide in the baby's serum[16].

All carbonic anhydrase inhibitors reduce breast milk supply and flow, however the concentration is too small to cause harm to the baby. A case report demonstrated that *Acetazolamide* plasma levels were low in infants exposed to the medication through breast milk[14]. Therefore, acetazolamide is approved by the American Academy of Pediatrics for use during nursing[20]. In the event that they are to be used, it is advisable to use *Dorzolamide* 2% dose, because of its limited systemic absorption.

In conclusion, the management of glaucoma in pregnancy involves close coordination of care involving ophthalmic surgeon and obstetricians. Generally most glaucoma medications may have to be changed to safer options at every stage of pregnancy such as *Brimonidine* in the 1st trimester. During the 2nd trimester options include *Brimonidine,* B – blocker agent such as *Timolol* eye drops. In the early 3rd trimester *Brimonidine* is preferred, while *Dorzolamide*2% eye drops is preferred in later 3rd trimester and breastfeeding mothers. All other anti-glaucoma drugs in category C can still be used in pregnancy depending on their strengths, dose, frequency of use and maternal ability to perform punctal occlusion or eye closure after instillation over a period of few minutes. Beta blockers may potentially cause bradycardia, arrhythmia, hypotension, respiratory distress, apnoea and hypoglycaemia in the newborn and possibly the fetus. They are therefore avoided in late third trimester.

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Table 1 showing safety of Glaucoma agents during pregnancy.

Agent	**Category**	**Potential effect**	**Recommended safe period**
Alpha adrenoceptor(Brimonidine)	B	None demonstrated	1st , 2nd& 3rd Trimester
Beta Blocking agents	C	Bradycardia, Hypotension, Hypoglycaemia	1st& 2nd Trimester
Prostagladin analogues	C	Oxytocic effects. Abortifacient	3rd Trimester
Carbonic anhydrase Inhibitors	C	Teratogenic effect	Late 2nd/3rdTrimester
Pilocarpine	C	None demonstrated in humans	All trimesters

Table 2 showing safety of Glaucoma agents during breast feeding

Agent	**Category**	**Safety in breastfeeding**	**Side-effects**
Alpha adrenoceptor(Brimonidine)	B	Contraindicated	CNS depression, apnoea, lethargy, Bradycardia
Beta Blocking agents	C	Safe	Rarely Bradycardia and hypotension
Prostagladin analogues	C	Likely safe	May reduce flow of milk
Carbonic anhydrase Inhibitors	C	Safe	
Pilocarpine	C	Unknown	

EVALUATION OF REFERENCE INTERVALS FOR PLASMA ELECTROLYTES, UREA AND CREATININE IN APPARENTLY HEALTHY STUDENTS OF NIGER DELTA UNIVERSITY, BAYELSA STATE, NIGERIA

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Abstract:

Background: *A locally-derived population reference interval is the backbone for correct interpretation of laboratory results. Reference values from American and European population are used for African population despite previous studies showing significant differences.*

Objective: *This study was to determine clinical laboratory reference values for plasma electrolytes, urea and creatinine of apparently healthy students.*

Setting: *College of Health Sciences, Niger Delta University, Bayelsa state, Nigeria*

Study design: *Cross-sectional prospective study.*

Methods and Materials: *102 apparently healthy students aged between 20-40years were selected by random sampling technique for the study. Electrolytes were assayed using Ion Selective Electrode (ISE) method, urea by enzymatic endpoint method and creatinine through enzymatic kinetic method on the plasma using Randox kits. Reference range was constructed using non-parametric method to estimate 2.5 and 97.5 percentile of distribution as lower and upper reference intervals respectively.*

Result: *The derived reference intervals for analytes in this study are: sodium (128.5-144.5)mmol/L,potassium(3.0-4.9)mmol/L,chloride(96-109)mmol/L,Bicarbonate(13.5-26)mmol/L,urea(1.9-4.6)mmol/L and creatinine (63 -108.5)µmol/L. There was no significant gender difference in all the studied analytes.*

Conclusion: *The developed reference intervals in this study are generally lower than the Caucasian (kit) values commonly used in our laboratories. Adoption of its use for patients' management within Bayelsa and southern Nigeria is advised.*

KEYWORDS: Plasma Electrolytes, Urea and Creatinine, Reference intervals, Healthy young students

INTRODUCTION:

Reference intervals of biochemical constituents can be defined as the concentration of analytes found in group of clinically healthy persons that are suited for the respective population. They determine whether disease is present or absent and if any individual is at risk from future disease state.[1]Clinical care requires adequate laboratory reference intervals for appropriate assessment of patients, monitoring disease progress as well as reporting adverse events. Interpretation of laboratory data is a decision making process that compares patients result with reference intervals from a local population or validates the use of those obtained from different setting.[2] The best reference interval for use is individual baseline biochemical values that had been documented all through their physiological and developmental milestone in healthy states. It is against these that pathological values are compared. However, due to difficulties in obtaining these, it becomes imperative to develop population reference intervals. Certain specified factors are needed when reference intervals are to be established: population make up, ethnicity, genetic factor, socioeconomic factors, analytical methods, diet, lifestyle, physiologic conditions among other controllable factors.[3] These factors has led to differences in the analytical outcomes of reference values.

The population reference intervals are established according to the recommendation of the Expert Panel on Theory of Reference values (EPTR) and of the International Federation of Clinical Chemistry(IFCC) who use the terms "normal range, reference range or reference interval" interchangeably to correspond to health associated (central 95%) reference intervals. [4,5]These values are taken to be between 2.5 and 97.5 percentile of the said population following strict quality assurance program and standard statistical methods. Establishing reference intervals continues to be a major challenge in many parts of the world because it is time and effort consuming and requires a lot of funds.[6] These limitations have led clinical laboratories to adopt manufacturers' (reagent kit) values mainly from Caucasian population which are often inappropriate for the diverse African population.

Currently, in Nigeria there are very few studies on reference intervals for electrolytes, urea and creatinine especially in the younger age groups and relevant clinical reference data are required for clinical practise and research in our region. In view of this, we embarked in this study to evaluate population reference intervals for electrolytes, urea and creatinine amongst healthy students of Niger Delta University, Bayelsa state, South-south Nigeria. The reported values may also as source of reference and comparison for laboratories in our environment.

Materials and Methods:

Study area and Design: The study consisted 102 apparently healthy students aged between 20-40years. The participants were recruited randomly. Participants with hypertension, diabetes, renal disease, liver disease or those on drugs for any illness were excluded from the study. Also excluded were those with history of smoking, alcohol intake, exercise excess, pregnant women, recent history of fever, trauma or blood transfusion. Relevant information demograph like age and sex were obtained alongside physical examination to rule out palor and jaundice.

Ethical Consideration: Ethical approval was sought and obtained for this study from the Niger Delta University ethics committee. Written and informed consent was sought and obtained before participation in the study.

Methods: Participants weight and height

were taken, basal metabolic index(BMI) was calculated, each of them was allowed 5minutes rest before blood pressure measurement at sitting position was done.

Specimen Collection: 4mls of blood was collected from each participant through an aseptic cubital vene puncture at sitting position and after a 10minutes rest period and transferred into lithium heparinised tube. This was centrifuged at 3000rpm using a bench centrifuge within 30mins of collection and plasma was separated with clean Pasteur pipette into plane bottles and stored frozen (at -20^0C) before analysis. Analysis was done in batches within one week of specimen of collection.

Measurements of Biochemical parameters: Na^+, K^+, Cl^- and HCO_3^- were analysed using direct electrochemical method using Ion Selective Electrode (ISE analyser LW E60E), Urea was analysed using enzymatic endpoint assay (urease-Berthelot method) with commercially available RANDOX kits where urea was hydrolysed to ammonia in the presence of urease. The ammonia is then measured photometrically by Berthelot's reaction. Creatinine was analysed using enzymatic kinetic method (modified Jaffe method) with RANDOX kits whereby creatinine in an alkaline solution reacts with picric acid to form a colored complex which is directly proportional to the creatinine concentration read photometrically.

Quality Control Procedure: Commercial quality control (QC) sera (normal, low and pathological ranges were analysed in each batch. Mean, standard deviation and the intra and inter assay Coefficient of Variations (CVs) were calculated and found to be within acceptable quality values of the method for each analyte.

Statistical Analysis: Continuous variables were summarized as mean± SD while categorical variable were expressed as frequency (normal Gaussian) distribution curves. Reference intervals were constructed using non-parametric method to estimate 2.5 and 97.5 percentiles of distribution as lower and upper reference intervals respectively. The statistical analysis were done using *Statistical Package for Social Sciences* (SPSS) software, (IBM *SPSS Statistics version 20* Armonk, New York.)

RESULTS:

There were 102 apparently healthy participants aged between 20-40years comprising of 55(54%) males and 47(46%) females. The mean age is 23.8 ±3.67 years. Table 1 depicts the mean ± SD of participants according to gender. There was no significant gender differences in sodium, potassium, chloride, bicarbonate, urea and creatinine values.

Table 1: Comparison of mean plasma electrolytes, urea and creatinine in participants by gender.

	Mean ±SD	Mean ± SD	Mean ±SD	
Analytes (unit)	**Total pop(n=102**	**Males (n=55)**	**Females (n=47)**	**P-value**
Sodium(mmol/L)	134.7 ± 4.12	134.01 ±3.65	134.37 ±5.20	0.12
Potassium(mmol/L)	3.75 ± 0.49	3.93 ± 1.35	3.75 ± 0.42	0.36
Chloride(mmol/L)	101.0± 3.56	100.79±3.56	101.29±3.55	0.13
Bicarbonate(mmol/L)	20.7 ± 3.13	20.47 ± 3.79	20.52 ± 4.02	0.95

	Mean ±SD	Mean ± SD	Mean ±SD	
Analytes (unit)	**Total pop(n=102**	**Males (n=55)**	**Females (n=47)**	**P-value**
Urea(mmol/L)	2.84 ± 0.73	2.84 ± 0.73	2.82 ± 0.75	0.91
Creatinine(µmol/L)	88.2 ± 13.2	88.16±12.98	87.28±14.20	0.74

Students T-test, p<0.05=Significant (S), Not Significant (NS)

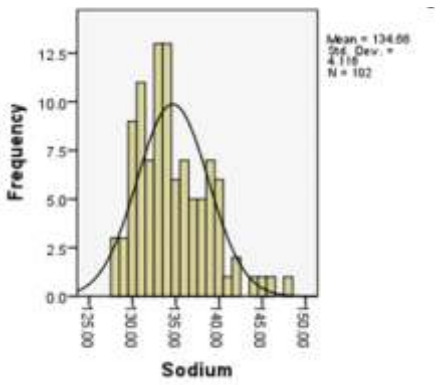
Table 2 shows reference intervals derived in this study for Sodium(128.5 -144.5)mmol/L, Potassium(3-4.9)mmol/L,Chloride(96-109.4)mmol/L,Bicarbonate(13.5-26)mmol/L,Urea(1.9-4.6)mmol/Land Creatinine (63-108)µmol/L with the assay methods used. Results obtained are lower than most standard reference quoted in Caucasians (kit) values.

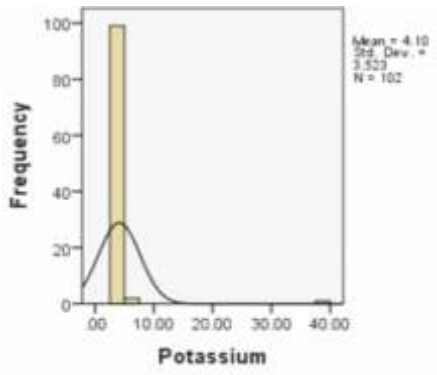
Table 2: Reference Intervals of Electrolytes, Urea and Creatinine (2.5- 97.5 percentiles) in comparison with Adopted (kit) values.

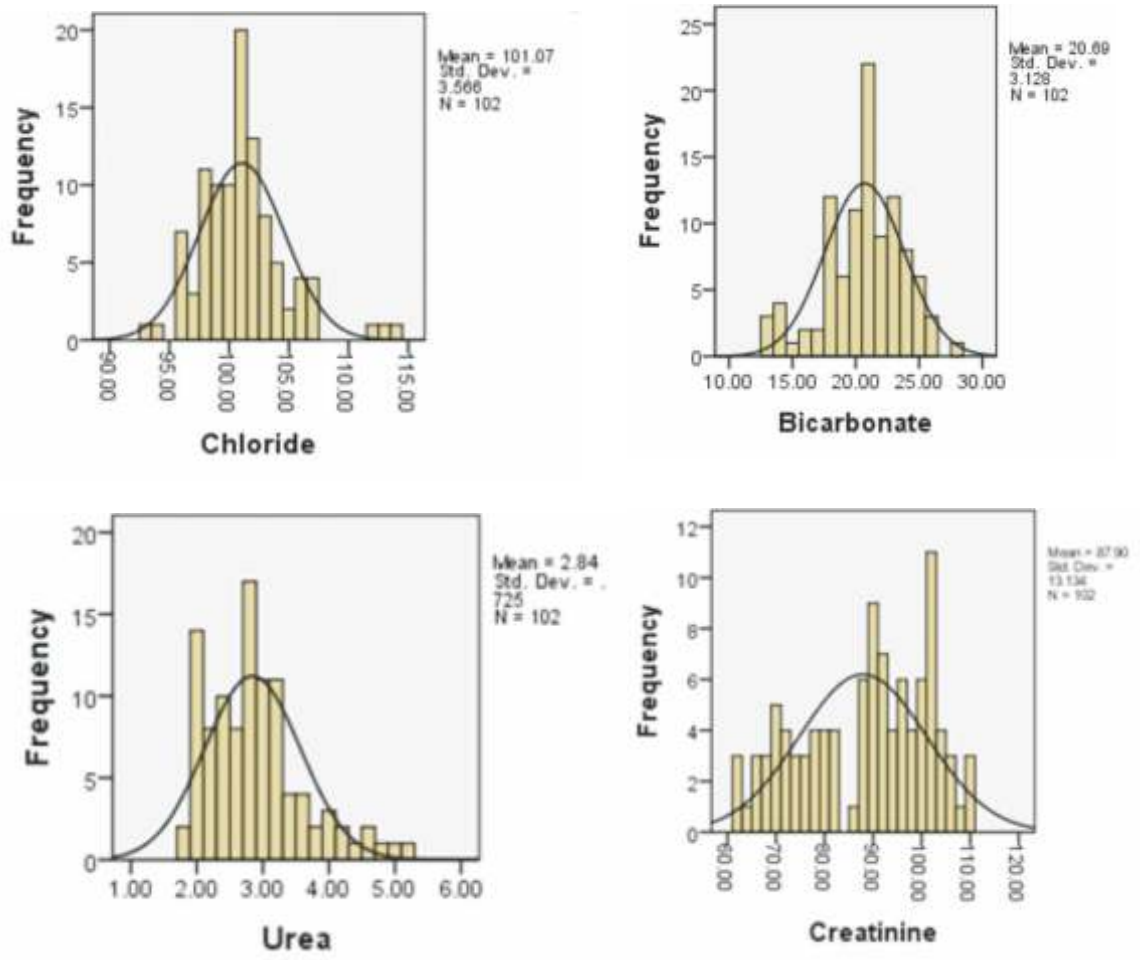
Analytes (unit)	**Min.**	**Max.**	**Median**	**2.5 percentile**	**97.5 percentile**	**Ref. Interval 2.5^{th} -97.5^{th}**	**Adopted Ref. Interval**
Sodium (mmol/L)	128	148	134	128.5	144.5	128.5-144.5	135-145
Potassium **(mmol/L)**	2.7	4.9	3.8	3.0	4.9	3.0-4.9	3.3 -5.0
Chloride **(mmol/L)**	98	114	101	96	109.4	96-109.4	95-110
Bicarb. **(mmol/L)**	13	28	21	13.5	26.0	13.5 -26.0	20-30
Urea **(mmol/L)**	1.8	5.1	2.8	1.9	4.6	1.9 -4.6	2.6 -6.0
Creatinine **(µmol/L)**	62	109	90	63	108.5	63 -108	60 -120

Key: Min=minimum, Max.=maximum, Ref.=Reference

All the analytes maintain normal (Gaussian) distribution curves as depicted in figures 1-6.







Figures 1-6 showing normal distribution curves of electrolytes, urea and creatinine.

Discussion:

The assessment of health status of individuals is made on clinical grounds by medical history, physical examination, laboratory tests and other special investigations using reliable reference data. In the absence of locally-derived reference values, clinicians and researchers had to use reference data from European and American population. Previous studies, [7, 8] showed variation in reference intervals with age, ethnic and socio demographic characteristics in different population hence, the establishment of regional specific reference values is essential for efficient patient management and proper conduct of clinical trials.

The reference intervals derived in this study differ slightly from the manufacturers (kit) reference values which were adopted from the Caucasian population. The differences in values may be related to methodologies of analysis, racial differences and. geographical location. Lifestyle, diet and genetic makeup may also play crucial role in these existing differences.

In this study, 15.7% of study population have lower potassium than 3.3mmol/L,57.8% have sodium <135mmol/L, 29.4% have bicarbonate lower than 20mmol/L and 34.3% had urea values< 2.6mmol/L. This result is similar to reports in Abeokuta[9] and LAUTH-Ogbomoso[10] both of south western Nigeria whose geographical location and other

demographic characters are comparable to ours here in south-south Nigeria. This corroborates with studies carried out in other African countries like Kenya, [11] Khartoum-Sudan[12] and Tanzania[13] which reported that derived reference intervals differed from the Caucasian (kit) values. This further underscores the need to derive population reference intervals.

This study also revealed no significant gender differences in values which is similar to a study done on medical students of Denmark University,[14] which reported no significant gender and age dependency in values. The story is however different in Plateau University study[15] and in Kericho, Kenya,[16] which reported gender differences in some biological analytes most especially urea and creatinine which is probably due to muscular build-up variation of both gender.

The limitation of this study are small sample size due to poor funding and not conducting a thorough clinical examination including urinalysis in the selection of healthy patients. However, the result in this study is tenable and highlights the importance of deriving local reference interval for our population.

Conclusion:

The developed reference intervals in this study are generally lower than the Caucasian (kit) values but similar to studies in areas of close geographical location. This underscores the need for individual laboratories to establish local population reference intervals rather than relying on manufacturers' (kit) values from another population. We recommend the use of these derived values in Niger Delta University Teaching Hospital, Okolobiri, other areas of Bayelsa state and Southern Nigeria.

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DEMOGRAPHICS OF ROOT PLANING IN A TERTIARY HOSPITAL IN NIGERIA: A 10 - YEAR REVIEW

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ABSTRACT

Background: *Subgingival root planing also referred to as conventional periodontal therapy or non-surgical periodontal therapy and is the treatment of choice for mild and moderate chronic periodontitis. This is the removal of dental debris, plaque and calculus from and smoothening of infected exposed root surfaces (planing). Cementum and dentine impregnated with plaque, calculus, microorganisms and their toxins are removed, thus establishing a periodontium and remission of periodontal disease*

Objective: *To assess the demographics of recipients of subgingival scaling and root planing as treatment modality at the Periodontal Out-patient Clinic of the University of Port Harcourt Teaching Hospital between January 2009 and December 2019.*

Method: *A self-developed proforma was used to collect data and SPSS ver. 20.0 used for the analysis of patients who attended the out-patient clinic. Descriptive data was generated and $p< 0.05$ was considered statistically significant.*

Results: *A total of six thousand, seven hundred and eighteen patients attended the clinic out of which one thousand, one hundred and eighty-nine patients aged between 17 and 87 years with mean age of 43.54 ±14.34 years had root planing done. The prevalence of root planing was 17.7%. There was a slight predominance of males (50.2%), main indication for root planing was chronic periodontitis and it was mostly done on molars (85.5%).*

Conclusion: *One out of every five patients had root planing done on their teeth due to chronic periodontitis.*

KEYWORDS: Subgingival Scaling, Root Planing, Demographics, Chronic Periodontitis

INTRODUCTION

Periodontal diseases comprise a broad group of pathological conditions affecting the supporting tissues of the teeth called the periodontium. The periodontium consists of the gingiva, cementum, periodontal ligaments and the alveolar bone. The two most prevalent and most investigated of these periodontal diseases are the plaque-induced gingivitis and chronic periodontitis.[1] Periodontal diseases such as gingivitis with prevalence ranging from 50% to 100%[2] and chronic periodontitis with prevalence between 30 and 35%.[3] are regarded as one of the two major oral health problems worldwide[4,5,] and in Africa[6]. The second major oral health problem worldwide is dental caries.

Worldwide epidemiological studies have shown that gingivitis is present in most populations globally, but that the more severe stages of periodontal disease (chronic periodontitis) though not as prevalent as previously believed, are still of significant magnitude, affecting up to 15-20% of most population over the age of 35[7-9]. Factors such as poor oral hygiene, low socio-economic status, increasing age and male gender have been reported to be related to an increase in the prevalence and severity of periodontal disease[8-11]

Chronic periodontitis is the inflammation of the periodontium and is characterized by alveolar bone loss, pathologic pocket formation, tooth mobility, tooth migration, halitosis and gingival recession. The radiographic evidence is vertical or horizontal bone loss[12,13].

The modality of treatment for chronic periodontitis that presents with mild to moderate periodontal pocket among other clinical signs such as gingival inflammation and gingival recession is subgingival scaling and root planing. Subgingival scaling and root planing is the removal of dental debris, plaque and calculus from and smoothening of infected exposed root surfaces (planing). Cementum and dentine impregnated with plaque, calculus, microorganisms and their toxins are removed, thus establishing a periodontium and remission of periodontal disease.[14-16]Scaling and root planing can also be referred to as conventional periodontal therapy or non-surgical periodontal therapy and is carried out with instruments called periodontal scalers and periodontal curettes.[16-19] Severe cases of periodontitis are managed not only by subgingival scaling and root planning but also as various forms of periodontal surgeries such as; access, osseous and regenerative procedures. However, most patients in our environment cannot afford periodontal surgical procedures due to our "fee for service" policy.

There is paucity of literature on the audit of non-surgical periodontal treatment in our environment. Therefore, the purpose of this study was to review the demographics of patients that received subgingival scaling and root planing over a ten-year period in order to have an overview of their pattern of presentation. This will yield important baseline data for healthcare policy makers in Nigeria to use to emphasize the need for the incorporation of oral health at all tiers of the health system in the country, encourage oral health promotion, enhance early access of preventive measures by the populace and also use for teaching purposes.

Methodology

A retrospective study done among patients who attended the Periodontology out-patient clinic of the University of Port Harcourt Teaching Hospital (UPTH) between January 2009 and December 2019.

Six thousand, seven hundred and eighteen patients attended the periodontology clinic between the period under review but only the records of the one thousand one hundred and eighty-nine patients who received subgingival root planing as treatment modality were retrieved from the clinic logbook. The patients who had other treatment modalities were exempted Ethical approval for the study was obtained from the Research and Ethics committee of UPTH A self-developed proforma was used to collect data on sex, age, type and number of teeth treated. The patients' age was grouped into: young adults (17-40 years), middle-age adults (41-64 years) and elderly (>65)[17].

Statistical Package for the Social Sciences (SPSS) ver. 20.0(IBM SPSS Armonk, New York) was used for the analysis. Descriptive data was generated and test for significance was done using Chi-square statistics with level of statistical significance set at $P < 0.05$.

Results

Table 1 shows the demographic details of the patients. One thousand one hundred and eighty-nine patients' data was used in this study with age ranging between 17 and 87 years and mean age of 43.54±14.34 years. There was a slight male predominance with M:F ratio of 1:1.01. Majority of the patients were in their 4th decade of life. More than two-fifth of the patients were middle aged (41-64years).

Majority 1017(85.5%) of the patients had subgingival scaling and root planning performed on posterior teeth. About four-fifth {954(80.2%)} of them had subgingival scaling and root planing carried out on more than one tooth. Table 2

Majority of patients irrespective of sex had posterior tooth scaling and root planing done for them. Statistical analysis showed no significance. It was statistically significant that more patients in their third to sixth decades of life, especially young adults (17-40years) and the middle-aged (41-64years) had subgingival scaling and root planing done. Table 3.

Nine hundred and fifty-four (80.2%) patients had subgingival scaling and root planing on more than 2 teeth. Table 4.

Tables

Table1. Socio demographics of Participants

Socio demographics	Frequency	Percentage
Sex		
Female	592	49.8
Male	597	50.2
Age Group		
10-19	26	2.2
20-29	221	18.6
30-39	285	24.0
40-49	205	17.2
50-59	252	21.2
60-69	167	14.0
≥70	33	2.8
Age Class		
Young Adult	546	45.9
Middle Age	557	46.8
Elderly	86	7.2
Total	**1189**	**100.0**

20-29	42	17.9	121	19.4	58	17.6	221	18.6			
30-39	56	23.8	144	23.1	85	25.7	285	24.0			
40-49	38	16.2	115	18.4	52	15.8	205	17.2			
50-59	58	24.7	124	19.9	70	21.2	252	21.2			
60-69	21	8.9	92	14.7	54	16.4	167	14.0			
≥70	14	5.9	14	2.2	5	1.5	33	2.8			
Age Class									**3.31**	**4**	**0.51**
Young Adult	107	45.6	285	45.7	154	46.7	546	45.9			
Middle Age	111	47.2	287	46.0	159	48.2	557	46.9			
Elderly	17	7.2	52	8.3	17	5.1	86	7.2			
Total	**235**	**100.0**	**624**	**100.0**	**330**	**100.0**	**1189**	100.0			

Discussion

In this study, majority of the patients who had root planing done were in their 4th decade of life, mostly males, had more than one tooth treated and mostly posterior teeth were treated.

The prevalence for root planing (treatment modality) and invariably for chronic periodontitis (periodontal disease) for this study was 17.7%. This is a lower prevalence considering that worldwide, the prevalence of chronic periodontitis in the general adult population is reported to be 30–35 %. [2,20-21] The mean age for this study was 43.54 ±14.34 years, similar to other studies done on periodontal diseases.

Studies[8-11,22-25] have shown that poor oral hygiene, low socio-economic status, increasing age and male gender are related to an increase in the prevalence and severity of periodontal disease. This study was similar as most patients had poor oral hygiene, majority were in the middle age and more male were recorded.

The molar teeth have been mostly implicated in periodontal diseases especially chronic periodontitis.[23] This may be due to the furcation areas that are anatomically derived between their multiple roots and which are more proximal to the oral cavity than the main roots and as such inflammation can spread to them earlier in the establishment of the disease. This study showed that the tooth mostly planed was the molar. 9 out of 10 patients had root planing on the molars with radiographic evidence showing furcation involvement in more than two-third of the patients.

Usually multiple teeth are implicated in periodontal disease. [7, 10] This study showed that 4 out of 5 patients had root planing done on more than one tooth. There was no statistical difference in the number of teeth treated across gender though males are more prone to periodontal disease than females, and bad oral hygiene and less professional care are the reasons for increased susceptibility to periodontal infections in males.[11] More males needed subgingival scaling and root planing in this study. Although generalised clinical attachment loss (CAL) is associated with age, this study did not assess the CAL in the patients.

There was no statistical difference in the number of teeth treated in the young adults, middle-age and elderly patients in this study which means that periodontal disease in this case chronic periodontitis cuts across all age group.

In conclusion, a high number of patients needed subgingival scaling and root planing; a non-surgical therapy for their periodontal disease because they presented late.

Recommendation

There is the need to promote oral health among the populace and educate them on the need to access preventive measures early and routinely rather than wait to treat oral complications.

Conflict of interest

The authors have no conflict of interest.

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COMPLETE AGENESIS OF THE MULLERIAN DUCT IN A BLACK AFRICAN: DIAGNOSTIC CHALLENGE: A CASE REPORT AND REVIEW OF LITERATURE.

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ABSTRACT

Mullerian duct agenesis, also known as Mayer – Rokitansky – Kuster- Hauser syndrome(MRKH syndrome), simply called Rokitansky syndrome or uterine aplasia, is a congenital malformation characterized by failure of the mullerian duct to develop, resulting in missing fallopian tubes, uterus and a variable degree of hypoplasia of the upper portion of the vagina with presence of normal development of secondary sexual characteristics and normal 46XX karyotype.

Complete mullerian duct agenesis is rare and only a few cases of MRKH syndrome have been reported in Africa. Here, we present a case of a 35year old woman who presented with primary amenorrhoea and the challenges of making a diagnosis of complete agenesis of the mullerian duct in a low resource setting.

KEYWORDS: Mullerian agenesis, primary amenorrhoea, laparoscopy, diagnostic challenges

Mayer Rokitansky Kuster Hauser (MRKH)syndrome is a congenital anomaly characterized by aplasia or hypoplasia of structures derived from the Mullerian duct. These structures include the fallopian tubes, uterus and the upper two thirds of the vagina[1]. Mayer Rokitansky Kuster Hauser syndrome is a rare entity which occurs sporadically with a global incidence ranging from 1 in 4500 to 5000 livebirths[1-3]. It may be isolated(typical) or associated with other anomalies such as renal, vertebral, to a lesser extent auditory and cardiac defects(atypical).[4,5]

There are few reported cases in Nigeria, but it is the most common cause of primary amenorrhoea worldwide[2,4]. The other causes of primary amenorrhoea include outflow tract disorders, hypothalamic, pituitary disorders, gonadal dysgenesis/primary ovarian insufficiency such as Turner syndrome, 46 XY--gonadal dysgenesis, receptor abnormality and enzyme deficiencies such as androgen insensitivity syndrome(AIS)[2].

This case is being presented to highlight the challenges of diagnosis and management of this rare condition in alow resource settings.

CASE PRESENTATION

Miss T.A a 35year old $P0^{+0}$ lady who presented with a failure to establish menses and desire to achieve pregnancy. She attained telarche at the age of 12years. She had normal female pattern of body hair distribution. She was sexually active and given a history of painful and incomplete penetration during vaginal intercourse. At the age of 19years she had a vaginal procedure in a private hospital on account of primary amenorrhoea, the nature of the surgery was unknown. She however still failed to establish menstruation.

A review of her past medical history and allergies were unremarkable. She was the second child of four siblings, two males and a 26year old female who attained menache at 12years of age and married with two children. There was no family history of similar illness.

On physical examination, Miss T.A was 1.45meters tall and weighed 58 kg(BMI=27.6kg/m^2). Breast development was Tanner stage 5 and she had normal female hair distribution. There was no skeletal deformity. Pelvic examination revealed normal labia majora, minora, clitoris and a 3cm blind ending vagina.

Laboratory investigations revealed elevated FSH levels of 69.61miu/ml and elevated LH levels of 25.30miu/ml, normal oestradiol levels of 65.40pg/ml and normal testosterone level of 13.91ng/dl. Her thyroid hormone levels were normal. Her karyotype was XX. An initial abdominopelvic ultrsound done before presentation to our facility revealed a small sized uterus measuring 3.1×1.2×1.3cm, normal gastrointestinal tract, normal kidneys and normal urinary bladder. A repeat abdomino-pelvic ultrasound at the Radiological Department of our institution by combined team of Consulltant Gynaecologist and Radiologist could not confirm the presence of a uterus. Intravenous pyelography revealed a normal urinary system and serum electrolytes and creatinine levels were within normal values. She was counseled on the findings and other modalities of definitive diagnosis. Miss T.Aopted for a diagnostic laparoscopy and findings were normal labia majora, minora, clitoris and a 3cm blind ending vagina without identifiable cervix while the internal view revealed absent fallopian tubes, uterus, cervix and upper vagina (fig 1). Both ovaries were present and appeared normal(fig 2). Unfortunately, we did not carry out video recording of the procedure.

She was subsequent counseled on the definitive diagnosis and reproductive options like assisted reproductive technology including surrogacy and adoption. She received counseling and psychosocial supports from psychologist and her family members.

DISCUSSION

The aetiopathogenesis of mullerian agenesis (MRKH) has been debated over the years. Recently it has been suggested that epigenetics may account for the aetiogenesis[1]. This is based on reports of one of two monozygotic twins developing MRKH, while the second twin wasspared[6]. The entity usually poses a diagnostic and treatment challenge to general practitioners as well as gynaecologists. The diagnosis of MRKH is frequentlymade clinically, but often confirmed either via radiological imaging or diagnostic laparoscopy, in patients whose hormonal and Karyotypic investigations for primary amenorrhoea are normal[7].

The commonest presentation amongst affected young women is primary amenorrhoea in the presence of normal secondary sexual development and difficulty with sexual intercourse[2,5]as was seen in this patient. Physical examination finding include normal female phenotype, with normal secondary sexual characteristics, blind ending short vagina and short neck. The labia majora and minora, clitoris ,hymen and distal portion of the vagina are usually present because of different embryonic origin[4].These features were present in this patient except the short neck and she was 1.45 meters tall like her other siblings. Other rare physical examination findings may include varying degrees of digital anomalies, cervicothoracic fusion and hearing defects and were not exhibited in this case[2].

There are various forms of MRKH syndrome, based on Oppelt et al rating[8]. Typical or isolated MRKH(type 1), characterized by uterovaginal aplasia or hypoplasia as demonstrated in this patient. Atypical MRKH(Type 2) consists of features of type 1 and renal malformation in addition with ovarian dysfunction. Mullerian Agenesis, Renal agenesis, Cervicothoracic Somite (MURCS) Syndrome is characterized by uterovaginal aplasia or hypoplasia plus renal, skeletal and heart malformations[2].

Hormonal profile and female Karyotyping are usually normal[4], but absence of normal ovarian –uterine communication in patients with MRKH syndrome may contribute to FSH, LH and inhibin B irregularity[9], as seen in this patient. These clearly differentiates MRKH from androgen insensitivity syndrome (AIS), an important differential of MRKH with similar presentation. Radiological imaging using ultrasound scan and Magnetic resonance imaging reveals an absent uterus or uterine rudiments, although her diagnosis was not dependent on radiological studies alone. A diagnostic laparoscopy is the gold standard for confirming the absence of the uterus and the presence of the ovaries. This diagnostic modality though invasive, was offered to our patient because it is available and accessible in our institution. It revealed complete absence of the uterus, cervix and the fallopian tubes with normal ovaries seen bilaterally. The finding at laparoscopy in this patient is contrary to previous reports in black African women with MRKHsyndrome with hypoplatic uterus with or without normal fallopian tubes[10,11].

In low resource setting, where high definition imaging technologies such as CT scan, MRI or laparoscopy are not available and/or scarcity of trained manpower to operate these facilities when available, the diagnosis of this clinical condition poses a challenge as exemplified in this case where abdomino-pelvic ultrasound gave conflicting reports.

Management of this condition is multidisplinary. It includes counseling, provision of a written document stating patient's diagnosis, screening for associated renal and skeletal anomalies, assisted reproduction, psychological support groups, patient involvement in peer group of women with MRKH, and creation of neovagina to have a normal sexual life[3]. The creation of neovagina can be achieved through non-surgical and surgical methods. The non-surgical method requires the patient to manually place successive dilators on the vagina dimple for at least 30-120minutes per day. A functional vagina for penetrative sexual activity will be created in highly motivated patients between six weeks to several months[1]. The patient presented had a short ending vagina adequate for penetrative intercourse, though painful. This may have been made possible through the help of

vaginal surgery she had at age 19. This is contrary to reports in the literature where most patients presented with vaginal dimple necessitating surgical creation of neovagina[1,1]. Hence, she was counseled on the various activities that would retain the patency, increase the vaginal capacity and relieve dysparunia. Surgical intervention is reserved for those unsuccessful with dilator or who prefer surgical options, with varying available techniques[4].

The patient presented in this case report presented with the typical history of amenorrhoea and dyspareunia. She was diagnosed at 35years, which is a rather late diagnosis compared to earlier age at presentation in developed countries[13]. This may be attributed to better patients' health seeking behavior, availability and affordability of various diagnostic modalities and trained personnel in such advanced societies. She presented during adolescence to a private general practitioner where she had a vaginal surgery. She may have been inappropriately evaluated due to a low index of suspicion on the part of the attendant practitioner as a result of the rarity of the syndrome, and non availability of the needed investigative modalities. A complete physical examination, pelvic ultrasound and hormonal profile are adequate to make the diagnosis and rule out its differential AIS, where the karyotype is XY with a phenotypic female. Other investigative modalities helped in excluding associated co-anomalies. Continuous medical education of practitioners in the management of primary amenorrhoea will immensely improve the clinical acumen of caregivers allowing for earlier diagnosis. This woman had to wait for 16 years to be diagnosed and receive appropriate care. Case reporting by practitioners would also aid in education of healthcare providers and the general populace.

CONCLUSION

Mullerian agenesis is a rare congenital anomaly and diagnosis poses a big challenge to the attending physician especially in low resource setting because of its rarity and unavailability of the needed diagnostic tools and skilled manpower to use the tools where available.

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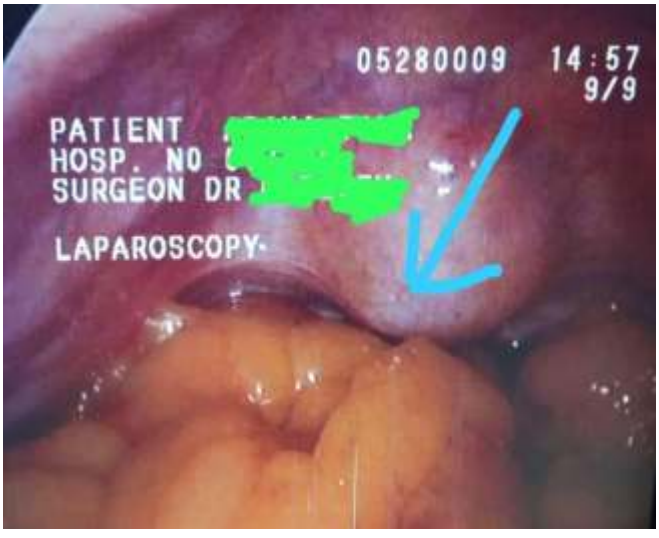

Fig 1. Laparoscopic view of the pelvis showing absence of the uterus and fallopian tubes.

Fig 2. Presence of ovarian tissue(arrow) in the pelvis during laparoscopy