*Afr. J. Med. Med. Sci.* (2017) 46, 407-412

# Paediatric Endocrinology in University College Hospital, Ibadan, Nigeria: Past, Present, Future

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**Abstract**

Paediatric Endocrinology is a relatively new sub-speciality of Paediatrics in Africa especially in Nigeria. In the past eight years the European Society for Paediatric Endocrinology has laboured to build capacity among health professionals in Africa. This kind gesture has started off a chain of events that has led to the emergence of Nigerian and African Societies for Paediatric and Adolescent Endocrinology as well as a progressive increase in the number of Paediatric Endocrinologists on the continent. It has also led to increased awareness, improved referrals and enhanced clinical care of children with endocrine disorders in Nigeria. This is an attempt to give a historic account of Paediatric Endocrinology at the University College Hospital, Ibadan, a major referral teaching hospital in Nigeria.

**Keywords:** *Paediatrics, endocrine, multi-disciplinary teams, University College Hospital (Ibadan)*

**Résumé**

L'endocrinologie pédiatrique est une sous-spécialité relativement nouvelle de la pédiatrie en Afrique, en particulier au Nigeria. Au cours des huit dernières années, la Société Européenne pour l'Endocrinologie Pédiatrique a travaillé à renforcer les capacités des professionnels de la santé en Afrique. Ce geste généreux a débuté une chaîne d'événements qui a conduit à l'émergence de la société nigériane et africaine pour l'endocrinologie pédiatrique et adolescente, ainsi qu'une augmentation progressive du nombre d'endocrinologues pédiatriques sur le continent. Cela a également permis une prise de conscience accrue, des références améliorées et des soins cliniques améliorés pour les enfants souffrant des maux endocriniens au Nigeria. Il s'agit d'une tentative de donner un compte rendu historique de l'endocrinologie pédiatrique au Collège Hospitalier Universitaire, Ibadan, un hôpital d'enseignement de référence majeure au Nigéria.

**Mots-clés**: *Pédiatrie, endocrine, équipes multidisciplinaires Collège Hospitalier Universitaire (Ibadan)*

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## Introduction

Paediatric Endocrinology is a sub-specialty that deals with the diagnosis and management of diseases of the hormonal system in children and adolescents. The diseases include diabetes and disorders of growth and puberty, sex development, thyroid function, adrenals, calcium and bone metabolism and obesity and its complications [1, 2]. In the past, Paediatric Endocrinology as a sub-specialty was under-developed in Nigeria and its importance was majorly under recognized as caregivers focused on communicable and infectious diseases [3]. It was rated very low in the educational curriculum at the University level and the Residency Training Programme also did not lay much emphasis on the acquisition of the relevant knowledge and skills in Paediatric Endocrinology. There were only two internationally recognized practising Paediatric Endocrinologists in Nigeria; Dr. Oduwole at the Lagos University Teaching Hospital (LUTH), Lagos and Dr. Ayoola at the University College Hospital (UCH), Ibadan. They operated in isolation with no support from the Federal government or any international agency. The national emphasis was on infectious and other communicable diseases and hence funding opportunities were limited for endocrine diseases. There were practically little or no national data on the prevalence of paediatric endocrine disorders while very little was going on in terms of research [3 - 5]. There was little or no collaboration with national or international bodies in the field of paediatric endocrinology.

## Paediatric endocrinology in the immediate past Nigeria (2007 – 2015)

In 2005 the initial attempt by European Society of Paediatric Endocrinology (ESPE) to collaborate with Nigerian doctors for capacity development was futile until, the emergence of the Paediatric Endocrinology Training Centre for Africa (PETCA) in 2007, which led to the attainment of the desired goals. The PETCA is a capacity-building initiative developed to fill the urgent need for paediatric endocrinology sub-specialists across Africa [5]. The Centre is located in Nairobi, Kenya and is sponsored by the World Diabetes Foundation (WDF) as well as the ESPE and the International Society for Paediatric

and Adolescent Diabetes (ISPAD). The Fellowship training consists of didactic sessions, lectures, journal reviews, clinics and research [5]. The stakeholders in the establishment of the Centre were Profs Zeev Hochberg, Martin Ritzen, Kerstin Albertsson-Wikland, Faisal Ahmed, John Gregory, Ragnar Hanas and others. The PETCA between 2007 and 2013 trained 12 Nigerians who were then mandated to establish good endocrine units in Nigeria. In 2012, the Paediatric Endocrinology Training Centre for West Africa (PETCWA) was established at the LUTH to serve the West African countries [2]. More Nigerians have been trained at this Centre as well.

Between 2010 and 2013 a lot has taken place: the African Society for Paediatric and Adolescent Endocrinology (ASPAE) was founded in 2010 and held scientific conferences in Kenya, Nigeria and South Africa. In 2011, Jarrett facilitated the formation of the Society for Paediatric and Adolescent Endocrinology in Nigeria (SPAEN). The ESPE decided to sponsor the initial PETCA graduates for a 3-6 months ESPE clinical Fellowship (for better exposure in the sub-specialty) to good centres in the United Kingdom and other parts of Europe which hosted the trainees. Update courses on diabetes as well as on growth were held in South Africa, Kenya and Nigeria with International European facilitators (Figure 1). Figure 1 shows some of the patients with diabetes mellitus attending a session during the Diabetes-In –Practise (DIP) course, Ibadan, Nigeria.

The ASPAE also gained recognition as a Paediatric Endocrine Society in the endocrine world as it was listed alongside the other societies during the 9th joint paediatric endocrine conference in Milan, Italy in 2013. There was a huge attendance by members at the ESPE conferences with members presenting their posters as well as being involved in abstract review.

The mandate received from ESPE was to build up a functional paediatric endocrine units at various centres and offer education through the training of medical personnel especially in the area of early detection and prompt referral of suspected endocrine diseases. The trainees were also to collect relevant data for determining the prevalence of different disorders as well as acquire skills through international exposure to established centres.

**Paediatric Endocrinology in the past at the UCH Ibadan (before 2011)**

Paediatric Endocrinology at the UCH evolved from the practice of Paediatrics with Dr.Olabiwoninu being the first Paediatrician to care for children with endocrine disorders in the hospital. Other Paediatric Endocrinologists who have worked in the Hospital include Dr. Akindele and Dr. Ayoola. There was a joint Endocrine/ Gastroenterology (GIT) clinic which held once a week. Attendance at the weekly clinic was very poor with predominant endocrine disorder being rickets, which constituted 56.4% of all cases seen in the Children's outpatient clinic in a

**Fig. 1.** Diabetes-In-Practise (DIP) course Ibadan, Nigeria 2013 hosted by the Unit and facilitated by ISPAD.

review by Jarrett *et al* [6]. There was no definite unit and so patients requiring inpatient care were admitted and seen alongside neurology patients. A proper endocrine unit was established in April 2012 and then allowed for bed assignment and with the adoption of a functional sub-specialty standard operating procedures.

**What were the challenges?**

*Poor referral practices*

Lack of knowledge and skills in the sub-specialty in Nigeria and Africa in general were responsible for the high level of ignorance leading to missed diagnosis and late or poor referral practices [7]. To change the poor referral practices there is a need for education of health workers through periodic organization of growth in practice (GIP) and other training courses in endocrinology. Well baby clinics, schools and primary health care facilities should be equipped to take measurements of both height and weight with provisions for referrals if these parameters are found to be abnormal based on growth standards.

*Poor Laboratory support*

The intense need for laboratory support has not been met up until the time of this report. Most hospitals, UCH inclusive, do not have sufficient infrastructure required to back the practice of paediatric endocrinology. The available services are most of the time, not within the reach of most patients because of the exorbitant costs of these investigations.

Unavailability of necessary hormones and other endocrine medicines for the treatment of endocrine disorders is a great challenge to the practice. Some cannot be brought into the country because of lack of authorization by the regulatory bodies while those medicines that eventually get approval to be sold in the country cost so much that potential buyers who have no medical Insurance scheme in place and would have to pay out of pocket are unable to buy them. The long duration of treatment required in some endocrine disorders also contribute to the high level of defaults and poor compliance to treatment with the resultant poor outcome. Improved diagnostic and treatment facilities are required to develop adequate skills for clinical diagnosis when resources are limited [1].

*Multidisciplinary approach needing a network of specialists*

Specific expertise in specialized areas requires practitioner education at all levels, with access to rapidly available and accurate radio diagnostic and genetic testing in centres of excellence [1]. The treatment requires a team of experts in different fields working together. This multidisciplinary approach to the management of affected children has not been available in various hospitals in the country. Additionally, unstable power supply makes it difficult to maintain the potency of hormones like insulin.

*Research development*

There is a need for standard registries and database for paediatric endocrine disorders. There should be good information technology systems and skilled staff to set up these registries. There has been very minimal funding within the country geared towards research in paediatric endocrinology.

**The practice of Paediatric Endocrinology in the present in UCH (2012 – 2015)**

The Paediatric Endocrine Unit of UCH developed a patient record keeping system in which the patient's vital contact information was recorded for the

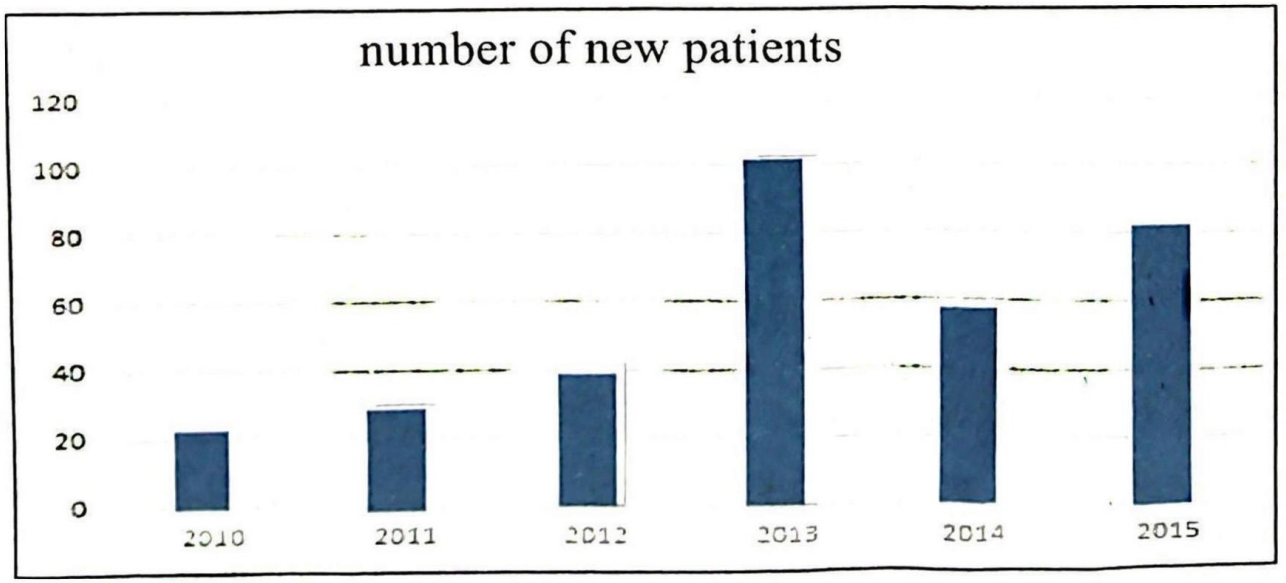


Fig. 2. New cases seen in the Endocrine Clinic of UCH from 2010 – 2015.

purpose of easy appointment scheduling and effective phone call reminders thus ensuring appointments for follow up visits were kept. Patients were also granted access to the doctor's phone number with which they could call in the event of emergencies or when there was a need for clarification in the course of patient's treatment. Figure 2 shows the progressive increase in the number of new cases seen in the endocrine clinic. In 2014 and 2015 the hospital experienced frequent and prolonged industrial strikes by different health professional associations which expectedly affected the number of patients seen during those years. Table I shows available data of old cases that presented in clinic for follow up.

**Table I.** Follow up cases seen at the Endocrine clinic from 2013 – 2015.

| | Male | Female | Total |
|---|---|---|---|
| 2013 | 109 | 118 | 227 |
| 2014 | 102 | 102 | 204 |
| 2015 | 126 | 134 | 260 |

The team developed different sub-teams with other sub-specialties and health professionals with the hope to improve clinical care and also boost research. It has good working relationship with other departments, organises case conferences, and conducts joint clinics periodically.

Health workers that have shown interest in the subspecialty have been sponsored to attend update courses and workshops.

*Well-structured clinics*

Before 2012, the Endocrine and gastroenterology out-patient cases were seen in the same clinic by the same set of doctors; but since a unit system was put in place in the department, different sub-specialty clinics have evolved. An integrated approach to the management of different common and uncommon endocrine conditions has been adopted by the Unit to ensure improved child care services.

*Formation of Multidisciplinary teams*

The team has formed the following teams for improved service delivery.

(1) Diabetes Mellitus (DM) Team: Diabetes clinic holds once a month (figure 3). The DM team is made up of the Diabetologists, Child Psychiatrists, Diabetic Educators, Dieticians and Paediatric Social workers. Every member of the DM team attends to these children in their own capacities and area of specialty.

**Fig. 3:** Paediatric Diabetes Clinic established during the DIP course in UCH Ibadan. Present are from the right to the left: Magaret Zacharin, Kathryn Hamilton, Carine de Beaufort, Bolanle Fetuga (at the door entrance), Tokunbo Jarrett and Abiola Oduwole

(2) Disorders of sex development (DSD) team: The Unit conducts a joint (with the Paediatric Surgeon and Paediatric Endocrinologist in attendance) DSD clinic bimonthly. The DSD team is made up of the Paediatric Endocrinologists, Paediatric Surgeons, Gynecologists, Child Psychiatrists and Paediatric Radiologists. Case conferences are held with all members of the team in attendance as well as parents/caregivers for improved service delivery. Interesting cases managed include Congenital Adrenal Hyperplasia (CAH), Ovotestis DSD, sex chromosome DSD, partial androgen insensitivity syndrome (PAIS), 5α reductase deficiency, micropenis and cryptochidism.
(3) Genetic team: Genetic clinic now runs once a month. The Unit designed a standard operating procedure (SOP) for every case of dysmorphism. Down syndrome cases constitute the largest number of patients seen with an average of one new case a week. In collaboration with the Down Syndrome Foundation of Nigeria (DSFN) in Lagos, an Ibadan branch of the Foundation, was formed. The Down syndrome Protocol of the Foundation for managing the affected children was adapted for local use thus allowing for an integrated approach to their management with impact on their quality of life. The Unit had a total of 120 patients with Down syndrome as of December 2015. Other syndromes managed in the Unit include: Edwards, Turners, Noonan, CHARGE, Treacher Collins, Klipper-weber-trenauny, Genoa, Ectodermal dysplasia, Osteogenesis imperfecta, Achondroplasia and Hemihypertrophy.

**Dynamic testings**

Despite the limitations, the unit is still able to carry out some tests for the patients. Some private laboratories process the samples collected during the hormone stimulation tests to complement the services offered in the Hospital's Laboratories.

Stimulation tests carried out to evaluate growth and glucose metabolism include: insulin tolerance tests (ITT) and prolong fasting tests. Glucagon, clonidine and arginine are not available in Nigeria for tests, hence insulin, being readily available, is used. The ITT is still considered the 'gold standard' practice though previous convulsions are an absolute contraindication [4]. Oral glucose tolerance test (OGTT) and assays for insulin, c peptide and HbA1c can be readily carried out on the patients attending the endocrine clinics. Thyroid function tests are the most frequently requested set of tests in the Unit and can be carried out readily within the Hospital. Auto antibodies testing are less frequently requested because of costs. Gonadotropin releasing hormone stimulation (GnRH) test and Human chorionic gonadotropin (HCG) stimulation test are also performed readily by the Unit. Similarly, adrenal function evaluation tests like dexamethasone test are also done.

Even though the requests for calcium, phosphate and alkaline phosphate assays are quite frequent, assays for parathyroid hormone and 25-hydroxycholicalciferol levels are too expensive, and hence are not done routinely.

Research focus in recent times has been the gathering of data to determine the pattern and burden of Paediatric endoctrine disorders in Africa. Presently, graduates of the PETCA and PETCWA schools have over 90 publications in reputable journals.

The Unit enjoyed free supplies of insulin, glucometers and strips for the DM patients for a period of one year (2013) as part of the 'Life for a Child' Programme of the International Diabetes Federation (IDF); other donors included pharmaceutical companies such as:- Eli Lilly and Company; and Roche Holding AG pharmaceutical company.

The team has been able to establish collaborations with foreign centres to boost its laboratory exemplified by its ability to send samples to Sweden for genetic testings in DSD children.
Unit Protocols have been developed for the management of different endocrine conditions such as diabetic ketoacidosis (DKA), short stature, congenital disorders, DSD and rickets. These have gone a long way in guiding Paediatric Residents and other health professionals that rotate through the Unit in the management of these conditions.

**The practice of Paediatric Endocrinology in UCH: Future**

The Paediatric Endocrine/ Genetic Unit should eventually develop into a department with different sub-specialists: Diabetologists, Experts in thyroid, DSD, pituitary, adrenal, growth, bone, as well as experts working alongside the Paediatric Oncologists for managing children with cancer especially post therapy, since cancer treatment is a well-known cause of long term endocrine disease [8].

The Outpatients Department is expected to grow to the extent that more clinics would then run weekly like the Growth Clinic, Thyroid Clinic, Adrenal Clinic, Joint Orthopaedic/Bone Clinic, and Young Oncology/ Late Endocrine Effects Clinic.

The Unit hopes to establish a vibrant community outreach programme which will include a functional School Health Programme.

We hope to establish a well-structured growth monitoring system (skillful staff, good equipment, growth charts etc) and also to develop different growth charts based on local data. Small-for-gestational age (SGA) infants from the neonatal units could be followed up for growth problems.

The establishment of a National Genetic centre where mutational analysis and other genetic tests would be carried out as well as a Hormone/ Endocrine Laboratory where all the assays can be carried out will further enhance the practice of Paediatric Endocrinology in Nigeria. This centre would serve not only the UCH, but the whole of Nigeria and the West Africa. We also hope to establish a well-equipped Pharmacy with links to international centres where medicines/hormones needed are brought into the country promptly at and when needed.

We hope to engage in more international collaborations in the area of research, especially in molecular genetic studies. We look forward to becoming a center where other health professionals like paediatric endocrine nurses, diabetic educators etc could receive formal training. We also hope to establish a vibrant centre for newborn screening for congenital hypothyroidism and other metabolic disorders to help in early detection and intervention thus reducing morbidity [9].

## Conclusion

The practice of Paediatric Endocrinology in the UCH, Ibadan has improved with greater awareness among health professionals but there is still need for growth. There is a need for changes in the health care system as regards referral criteria, laboratory and pharmaceutical development, as well as improved acquisition of skills and knowledge amongst other disciplines, forming teams responsible for taking care of children with chronic endocrine diseases and syndromes.

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