CONTRIBUTIONS OF IBADAN TO THE DEVELOPMENT OF PATHOLOGY IN THE TROPICS

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"I returned, and saw under the sun, that the race is not to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favour to men of skill; but time and chance happeneth to them all."
Eccl. 9:11, KJV

INTRODUCTION

The Vice-Chancellor University of Ibadan, the Deputy Vice-Chancellor (Academic), the Deputy Vice-Chancellor (Administrative), the Registrar, the Acting University Librarian, the Bursar, the Provost College of Medicine, Deans of Faculties, the Postgraduate School and of Students, Directors of Institutes, Heads of Departments, Members of staff, Students, Distinguished Ladies and Gentlemen. I am most grateful to the outgoing Dean of my Faculty in the person of Professor FAA Adeniyi and to the outgoing Provost of the College of Medicine, Professor IF Adewole for having given me the singular honour of delivering this inaugural lecture on behalf of the Faculty of Basic Medical Sciences. To God be the Honour and Glory for allowing all of us present here to witness this day. Pathology is the clinical diagnostic science that underpins patient care. The main subdivisions of Pathology are histopathology, chemical pathology, haematology and medical microbiology. The clinical practice of histopathology subsumes cytopathology, forensic pathology, oral pathology, neuropathology, paediatric pathology and other subspecialties (Royal College of Pathologists, 2006).

For the record, this is the third inaugural lecture emanating from the Department of Pathology of the University of Ibadan. Professor AA Abioye delivered the first inaugural lecture from the Department of Pathology. The title of his lecture was ***"Death and Dying - Perspectives of Disease."*** Professor PU Aghadiuno delivered the second inaugural lecture. The title of that lecture was ***"The Lady and the Looking Glass - Breast Cancer in Nigerian Women."*** As you may have observed, there has been an alphabetical progression in the order in which inaugural lectures from the Department of Pathology are given!

Numerous illustrious pathologists have worked in the University of Ibadan, many of them of legendary stature. The first Head of Department was Professor WD Silvera, a Jamaican, who arrived in Nigeria in 1952 (Ajao, 2005). He was succeeded in 1955 by Professor BGT Elmes. The next Head of Department was Professor GM Edington, the co-author of the classical reference on Pathology in the Tropics. He was followed by Professor AO Williams, arguably one of the most prolific pathologists in sub-Saharan Africa. Then followed Professor BO Osunkoya, an immunologist who made significant contributions to the literature on Burkitt's lymphoma. Next was Professor AA Abioye, who made landmark contributions to tropical pathology, especially regarding colorectal carcinoma and amoebiasis. The next Head of the Pathology Department was Professor TA Junaid, who has contributed to gynaecological, urological and tropical pathology. He was succeeded by Professor PU Aghadiuno, who largely concentrated on the study of breast cancer. More recently, the next Head of Department was Professor JO Thomas-Ogunniyi, who has contributed to the study of renal diseases, malignant lymphoma and cytodiagnosis in Ibadan, among other achievements. Her successor was Professor JO Ogunbiyi, my immediate predecessor, who has also made his mark in the field of pulmonary cancer, liver cancer and prostate cancer.

By the design of fate, the lot has fallen upon me to give this inaugural lecture, in the midst of such a distinguished list of forerunners. For the record, this is the first inaugural lecture from the Department of Pathology to be delivered by an alumnus of the University of Ibadan. The topic for today's lecture is ***"Contributions of Ibadan to the Development of Pathology in the Tropics."***

PREAMBLE

In keeping with tradition of previous inaugural lectures, I will present an encapsulation of my contributions to the discipline, before presenting those of my predecessors and future successors in the Department to the field of Pathology.

The first question anyone in the audience may ask is "Why did I choose Pathology as a discipline?" The answer to this question stems from my early childhood desire to become a medical doctor, in fulfilment of the injunction of my late mother, who died on the 29th of June 1970, following surgery for an intracranial tumour. Naturally, when admitted into the University of Ibadan in 1977, I intended to specialise in

Neurosurgery. As fate would have it, the odyssey through medical school, housemanship and a year of National Youth Service redirected my focus. My undergraduate interest in Pathology was kindled by my teachers, Professors Abioye, Junaid, Aghadiuno, Thomas and Odesanmi. Another strong influence was that of Dr. SO Lawal, now Chief Consultant Physician with the Nigerian National Petroleum Company, who was the Senior Registrar to Professor OO Famuyiwa in the Endocrinology Unit during my first clinical medicine posting. Other pivotal influences were those of Dr. OO Ogunkunle and Professor Solomon Kadiri, who tutored a group that I belonged to in the tenets of paediatric and adult cardiology, respectively.

During my housemanship and National Youth Service, I began preparing for the primary exam in Internal Medicine and applied to the then Head of Department, Professor BO Onadeko for a residency position in Medicine. At this time, I was interested in somehow combining clinical medicine and pathology. An important decisive event occurred one evening, while I was watching the NTA network news during my housemanship in Benin City. I witnessed the interview of Professor JO Thomas-Ogunniyi, who had just qualified as the first Nigerian female pathologist. Needless to say, I promptly changed my application at the University College Hospital from Medicine to Pathology and the rest, so to say, is history! Soon after joining the department, I was taken under the wings of Professor PU Aghadiuno. I must mention for the benefit of those in the audience who might be too young to remember, that the mid-eighties and early nineties marked a massive exodus of Nigerian intellectuals to the Diaspora. Against the tide of events, Professor Aghadiuno and several other patriotic Nigerians chose to remain behind in the face of pressure from the adverse economy and an inclement socio-political environment. The noble sacrifice of these stalwart individuals, as well as the tremendous moral and material support of others in the Diaspora, I must quickly add, ensured the sustenance of undergraduate and postgraduate training and research in the country.

Professor Aghadiuno was a perfectionist and therefore a very good role model for the budding pathologists he shepherded. It was while understudying him that I came to realise the importance of systematic and meticulous data gathering and recording and repeated editing of scientific publications. Professor Aghadiuno and I worked for several years on a series of articles on breast cancer, only one of which got published with me as a co-author (Aghadiuno *et al*, 1994), but a couple of others which did not see the light of day. This regimen inculcated into me the tradition of continued writing and rewriting, which stood me in good stead in later years, when I began to initiate other collaborative studies.

TERATOMA

The influence of Professor TA Junaid early on during my postgraduate training is gratefully acknowledged. He encouraged all of the Pathology trainees in the Department, numbering about ten, in the mid-1980s, to select individual research topics for formal seminar presentations. It was serendipity that guided my own choice of a research topic. When reviewing a histological section of an ovarian teratoma during my first year of residency training, I encountered a fascinating focus in this tumour displaying mature well-formed cerebellar tissue. I subsequently had the opportunity to read extensively on the subject of teratomas.

For those of you in the audience who are probably not familiar with the terminology, a few preliminary definitions may be appropriate. In conventional parlance, the terms "tumour" and "neoplasm" are interchangeably employed to refer to a mass produced by autonomous, uncontrolled, purposeless proliferation of a clone of cells derived from a single parent cell in which a successive chain of genetic events referred to as mutations have occurred. Generally, tumours may either be benign (relatively harmless) or malignant (potentially lethal). Malignant neoplasms are generically referred to as cancers.

Teratomas are tumours that are widely accepted to originate from primitive cells originally destined to populate the primordium of the developing ovary and testis referred to as germ cells. Germ cells are birthed in a region of the embryo referred to as the yolk sac and during embryonic development, germ cells migrate along the midline towards the developing gonad. Small clusters of cells may arrest along the path of migration in the midline and subsequently in later childhood or in adult life, these aberrantly located germ cells may give rise to a variety of so-called germ cell tumours, of which teratoma is a major example (Talerman, 1985).

The word "teratoma" is derived from the Greek word "teratos," which translates in English to monster. This is an apt term to describe this variety of tumours in which mature and/or immature tissues of an extremely wide range may develop. Macroscopic inspection of the typical ovarian teratoma will often reveal a cyst filled with fluid, fatty material and hair. Teeth, bone and cartilage are also usually easily recognizable. Understandably, these neoplasms have for long excited considerable wild speculation and several elegantly designed and executed clinical and experimental studies. Teratomas were recognised among the ancient

Babylonians of Chaldea as long ago as 2000 BC, as documented in an ancient record on a cuneiform tablet (Williams *et al*, 1970). In 1659, Johannes Scultetus made the earliest known medical record of an ovarian teratoma (Blackwell, 1946). Witchcraft, superstition and religion have been evoked at various times to explain the occurrence of these neoplasms. It was only in the late 19th century that the simultaneous evolution of several scientific hypotheses emerged regarding the genesis of these neoplasms. These include

- Firstly, escape of totipotential primordial cells from hormonal growth control, as originally suggested by Calbet in 1893 (Izant and Fulston, 1975)
- Secondly, the observation of an intra-abdominal foetus in foetu by Meckel in 1880 led Ekehorn in 1897 and Askanazy in 1908 to suggest that at least some teratomas represented suppressed second twins (Lewis, 1961; Jacobs, 1929)
- Thirdly, in 1926, Bosaeus postulated that parthenogenetic division of germ cells in the region of Hensen's node gave rise to teratomas (Izant and Fulston, 1975). Parthenogenesis is a quirky process somewhat analogous to cloning, whereby an entity attempts to replicate itself in the absence of fertilization of ovum by spermatozoon!

On microscopic study, a vast array of virtually every recognizable (and probably some as yet unrecognisable), type of embryonic, foetal and adult cell and tissue including skin, fat, bone, respiratory epithelium, teeth, smooth muscle, brain tissue, cartilage, thyroid, prostate (Akang *et al*, 1992a; Uzoaru *et al*, 1992) and other tissue types are found haphazardly intermingled (O'Hare, 1978).

Teratomas accounted for 3.4 cases per 1,000 surgical biopsies received in the Pathology Department of University College Hospital, Ibadan, between 1960 and 1985 (Akang *et al*, 1994). The most common site of teratomas was in the ovaries (83.2%), followed by the sacrococcygeal region (6.3%). Other sites of occurrence included the neck, testes, mediastinum, abdominal cavity and buccal cavity in descending order of frequency. Rare sites of occurrence were extracranial, intracranial, uterine cervix and intraocular regions.

The peak age of occurrence of teratomas in males was in the first decade of life, while females showed a peak incidence in the first and fourth decades of life. Gonadal teratomas of the ovaries differ in several remarkable aspects from their testicular counterparts (Ulbright, 2005). First of all, ovarian teratomas are by far much more common than testicular teratomas. Indeed adult and childhood studies reveal that testicular teratomas are much less common in Nigerian and South African children than among their Caucasian counterparts (Akang *et al.*, 1992a; Akang *et al.*, 1994; Bezuidenhout *et al.*, 1997). Secondly, as illustrated in Figure 1, whereas ovarian teratomas differentiate to form other germ cell tumours, teratomas of the testis arise from other pre-existing germ cell neoplasms (Ulbright, 2005).

Childhood teratomas are uncommon neoplasms worldwide (Akang *et al.*, 1992a). Eighteen percent of childhood teratomas occur in children up to 15 years of age, with a female to male ratio of 5:1. The two most common sites of occurrence in children are the

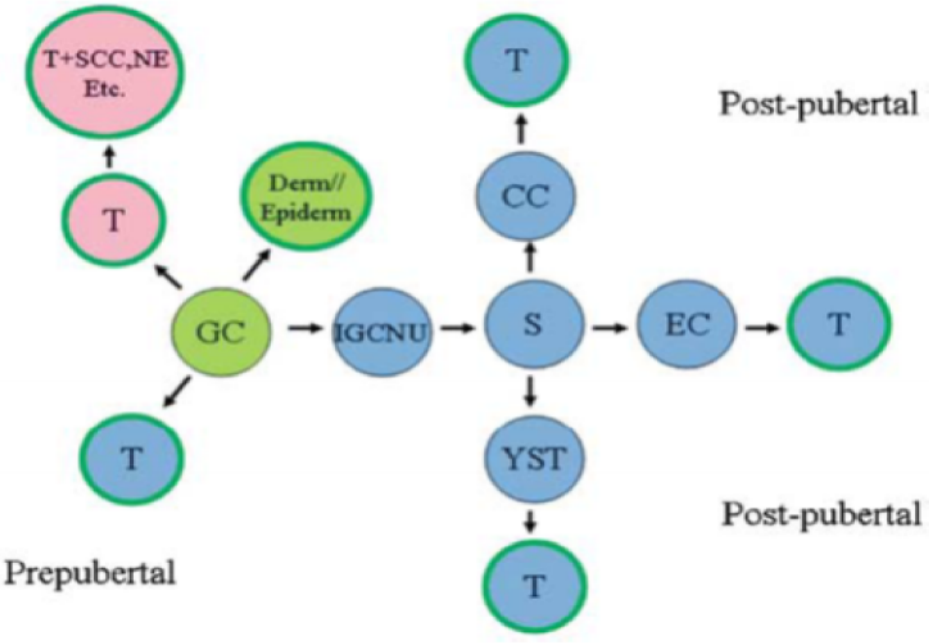

Figure 1: Histogenetic model for development of teratomas of the ovaries, pre-pubertal testes and post-pubertal testis (Ulbright, 2005)

sacrococcygeal region and the ovaries. Eighty-one percent of all childhood teratomas are benign. Malignant neoplasms usually occur in the sacrococcygeal region and in relatively older patients.

PAEDIATRIC PATHOLOGY

It must be acknowledged that it was Professor PU Aghadiuno that urged me soon after I was appointed to the Department of Pathology as a Lecturer 1 in 1990 to focus on the subject of paediatric pathology. In short order, I elected to investigate retinoblastoma as the topic of my dissertation for a second post-graduate fellowship. Retinoblastoma is a malignant intraocular childhood neoplasm originating from primitive retinal precursor cells (Ajaiyeoba *et al*, 1993). At a rather superficial level, there is some analogy between retinoblastoma and teratoma, since both groups of neoplasms may be regarded as developmental neoplasms. However, whereas teratomas originate from totipotential tumour stem cells, which may literally form any conceivable type of tissue, retinoblastomas originate from committed stem cells, which specifically display retinal differentiation at the light microscopic, electron microscopic and molecular level (Ts'o *et al.*, 1970a; Ts'o *et al.*, 1970b).

Retinoblastomas are relatively more common in developing countries, accounting for 10-15% of childhood cancers, than in Europe and North America, where they account for only 2-4% of childhood cancers (Yeole and Advani, 2002). Retinoblastoma is the second most common childhood cancer in Ibadan. In children with retinoblastoma, a fatal outcome is more frequent among Africans than Caucasians. An adverse outcome is more frequent among younger patients with bilateral eye tumours, orbital tumour recurrence and tumour metastases. In spite of the availability of radiotherapy, the outlook for children with this neoplasm in this environment is still bleak in comparison with what obtains in developed countries (Ajaiyeoba *et al.*, 1993).

The next subject area I ventured into was the field of childhood mortality. Over the years, there has been a tradition of excellent record keeping in the Pathology Department, which one hopes will be maintained and upgraded to electronic format for posterity. This afforded me the opportunity to delve into the post-mortem books of the department with the aid of two of my junior colleagues, Dr. Hamidu Umaru Pindiga (now Reader in the Department of Pathology and the Vice Dean, College of Health Sciences at the University of Maiduguri) and Dr. Adebukola Abiola (now a Consultant Family Physician practising in New York). This study revealed that infections, particularly of the respiratory tract were a leading cause of death (Akang *et al*, 1992b; Akang *et al*, 1993a). Meningitis, gastroenteritis, tuberculosis, measles, malaria and tetanus were other frequent causes of death. The implementation of immunization schedules should be vigorously pursued in order to curtail childhood mortality resulting from infection.

Other studies have demonstrated that congenital malformations, particularly of the gastrointestinal, cardiovascular and urinary systems constitute a significant problem among African children (Akang *et al*, 1992b; Akang *et al*, 1993b).

An extremely important area in paediatric pathology is the field of childhood cancer (Akang, 1996). By virtue of several peculiar features, childhood neoplasms provide a fertile field for epidemiological research and afford a unique opportunity for studying possible mechanisms of carcinogenesis. Firstly, these neoplasms often recapitulate developing foetal tissues. Secondly, they are amenable to cure in some cases. Thirdly, they are in some cases essentially restricted to early childhood. Tragically, more than 85% of childhood cancers occur in developing countries of the world, which only have access to less than 5% of the world's resources. Rapid increase in population, poverty, and the high prevalence of infection are problems that beset children in tropical countries (Yaris *et al*, 2004).

The common childhood cancers include lymphomas (45.4%), retinoblastomas (9.7%) and malignant renal neoplasms (8.5%). In particular, Burkitt's lymphoma (named after the British surgeon Dennis Burkitt, who first described the tumour in 1956 at Mulago hospital in Uganda, constituted 92% of all lymphomas and 37% of all childhood tumours. The frequency of Burkitt's lymphoma has been demonstrated to be declining in Ibadan and other parts of Nigeria (Akang, 1996; Ojesina *et al*, 2002).

An unfortunate recurrent theme in childhood cancer is the observation that most patients present at a very late stage, when treatment, if available, has little chance of effecting cure. To compound this problem further, more often than not the parents of afflicted children do not have the financial wherewithal to cope with the intensive demands of cancer chemotherapy. It has come to our attention that we have been misquoted by Hadley *et al.* (2001) as opining that children with advanced cancer do not deserve aggressive chemotherapy. On the contrary, it is our view that every child with cancer deserves the best possible care, no matter what the stage of disease is.

NEUROPATHOLOGY

It is pertinent that my very first published article in the field of neuropathology was a case report on coenurosis of the central nervous system, co-authored with Professors Jaiyeola and 'Sola Ogunniyi, Dr. Adefolarin Malomo, and Professor 'Tayo Shokunbi. However, as earlier mentioned my research interests had earlier been directed to the area of paediatric pathology by my mentor, Professor PU Aghadiuno. In late 1991, my foray into neuropathology was facilitated by the visit of Professor Hugh Hendrie to the University of Ibadan to work on collaboration with Professor BO Osuntokun, which marked the birth of the Ibadan-Indianapolis dementia project. Naturally, Professor Aghadiuno, being a long-term collaborator with Professor Osuntokun, was incorporated into the project and he nominated me to go abroad for training in neuropathology.

In an early survey I collaborated in, autopsy brain specimens revealed a lower incidence of neurofibrillary tangles and plaques in the brains of normal elderly Africans from Ibadan, and age-matched Caucasians from Australia (Osuntokun *et al*, 1994). Between 1992 and 1993, I spent a year in the neuropathology laboratory of Bernardino Ghetti in Indianapolis. During this sojourn, I had the opportunity to come under the tutelage of three virtuoso neuropathologists, Jans Muller, Biagio Azzarelli and Bernardino Ghetti. It was an extremely enriching experience, during which I contributed to a case study of measles retinitis complicated by subacute sclerosing panencephalitis (Park *et al*, 1997).

Under the guidance of that great colossus, Professor B.O. Osuntokun, his able successor, Professor A.O. Ogunniyi and collaborators from Indianapolis and Ibadan, the Dementia Research Project has made seminal contributions to the field of dementia in the tropics (Ogunniyi *et al,* 2002). These contributions have been highlighted in the inaugural lecture of Professor AO Ogunniyi.

Contributions from Ibadan Pathologists to the Development of Pathology

Ibadan has always been a guiding light for research and postgraduate training in just about every academic discipline in Nigeria and Tropical Africa. As noted by *Emeritus* Professor Akinkugbe in the Convocation lecture he delivered on the occasion of the 50th Foundation Day Anniversary of the University of Ibadan in 1998, Ibadan graduates have made significant impact on every aspect of the total social and political landscape of Nigeria (Akinkugbe, 1998). Ibadan is incontrovertibly the foremost source of high-level manpower in Nigeria, with significant contributions to Politics, the Civil Service, the Judiciary, the Armed Forces, the Academia, the Diplomatic Service and in virtually all professions. This seminal observation is equally true in the field of Pathology and other arms of laboratory medicine. A large proportion of practising pathologists at every level in the country and in the Diaspora worked or trained in Ibadan during at least some part of their professional development. The list includes a former State governor, former Deans, Vice Deans and Provosts of Medical Schools in the country, as well as several Professors of Pathology, both at home and abroad.

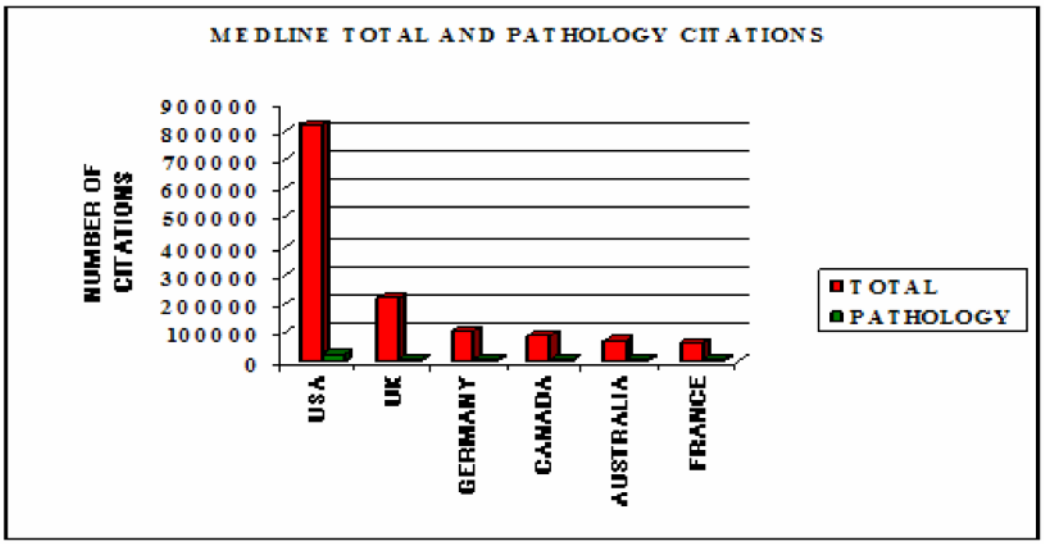

Figure 2: Total MEDLINE citations and Pathology-related MEDLINE citations from selected developed countries

A review of the Medline database, which encompasses indexed medical journal articles, was performed using the names of different countries and African cities

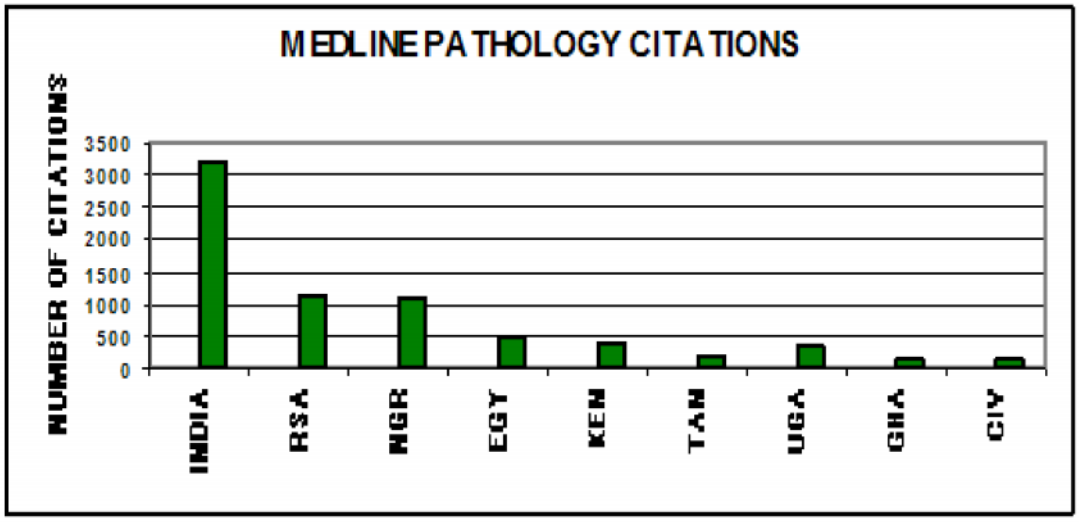

Figure 3: Pathology-related MEDLINE citations from selected developing countries

as search terms. Naturally, as shown in Figure 2, the greatest number of citations was from the United States (822,739 citations), United Kingdom (217,293 citations) and Germany (101,931 citations). Among developing countries, India (53,971 citations), South Africa (22,113 citations) and Nigeria (15,004 citations) were the leading countries.

Among the developing countries, the leading number of Pathology citations came from India, followed by the Republic of South Africa (RSA), Nigeria (NGR), Egypt (EGY), Kenya (KEN), Tanzania (TAN), Uganda (UGA) and Ivory Coast (CIV) as shown in Figure 3.

From Figure 4, it may be discerned that among Nigerian cities, Ibadan had the overall highest number of total and Pathology Medline citations, followed by Lagos, Zaria, Enugu, Nsukka, Benin City, Maiduguri and Calabar. The highest proportion of Pathology publications emanated from Ibadan (11.4%), Zaria (10.5%) and Maiduguri (9.6%), while the lowest proportion (5.5%) emanated from Benin City.

Recently, the College of Medicine established a committee chaired by Professor AG Falusi of the Advanced Institute for Medical Research and Training to compile the publications of serving and retired members of staff to commemorate its 25th anniversary. In the course of reviewing the daunting list of publications of those from the Department of Pathology, the seeds for the theme of this lecture were germinated. Time and space will not permit detailed consideration of the contributions of specific pathologists working at Ibadan to the medical literature. Important highlights will be itemised and are summarised

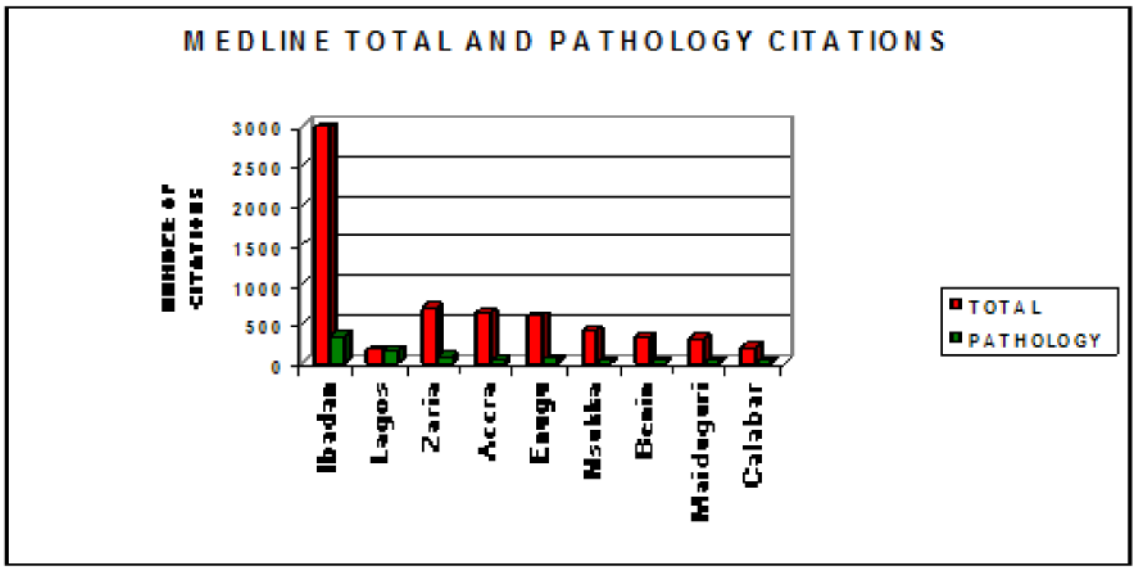

Figure 4: Pathology-related MEDLINE citations from selected Nigerian cities and Accra, Ghana

in table form below. It should be noted that this analysis is by no means exhaustive.

George Millar Edington
Before coming to Nigeria, Edington had already made a name in Ghana between 1950-1960, with landmark publications in sickle cell anaemia, haemoglobinopathies and schistosomiasis, among other seminal publications. Over the next 16 years, Edington published several articles on endomyocardial fibrosis, Burkitt's lymphoma, atherosclerosis, cancer epidemiology, schistosomiasis, yellow fever, Lassa fever and malarial nephropathy. From Ibadan, this great man went on to establish the Pathology departments at the medical schools in Zaria and subsequently, at Maiduguri.

Akin Olufemi Williams
This graduate of the Trinity College Dublin did his Doctor of Medicine thesis on experimental liver pathology. He was another extremely prolific author, with catholic interests in the field of clinical pathology. Professor Williams subsequently left Ibadan to become the foundation Head of Pathology at the fledgling College of Medicine of the University of Calabar. He later became Nigeria's Ambassador Plenipotentiary to the Organisation of African Unity before finally moving to the Laboratory of Molecular Virology of the National Institutes of Health at Bethesda, Maryland.

Babatunde O Osunkoya
Professor Osunkoya bestrode both the Departments of Chemical Pathology and Pathology. He made unique contributions to the scientific literature on Burkitt lymphoma and immunology.

AA Abioye
Professor Abioye was another alumnus of the Trinity College Dublin. As mentioned earlier, he made important contributions to the literature on amoebiasis and gastrointestinal pathology.

EB Attah
Professor Ed 'B Attah started his academic career in Ibadan before moving to Zaria to succeed Edington as Professor and Head, when the latter left to establish the Pathology Department at Maiduguri. His research interests included urological and cardiac pathology, as well as medical education. He later left to join Professor AO Williams at Calabar and later became Provost of the College of Medicine at Calabar.

TA Junaid
Professor TA Junaid was the first Ibadan University alumnus to head the Department of Pathology. He made landmark contributions to gynaecological pathology, with particular reference to choriocarcinoma, hydatidiform mole and ovarian tumours, as well as to urological pathology. He left Ibadan in 1987 to become Chairman of the Department of Pathology at the University of Kuwait. Incidentally, he was one of those that had to flee Kuwait following the incursion of the infamous Ayatollah Khomeini into the country. Undaunted, Professor Junaid returned to Kuwait when the dust settled to later assume the mantle of Dean of the Faculty of Medicine.

JO Thomas
Professor Thomas-Ogunniyi was the second alumnus and the first female to assume the mantle of Head of Department. She made contributions to renal pathology, cytology and lymphoma.

JO Ogunbiyi
The research interests of the next Head of Department, Professor Olufemi Ogunbiyi included liver pathology, hypertension and prostate cancer. He has served as the Secretary-General to the West African College of Physicians and is currently the President of the Nigerian chapter of the International Academy of Pathologists.

FUTURE DIRECTIONS

Emerging horizons in research in pathology at Ibadan include gastrointestinal and liver pathology, breast cancer and cervical cancer, which have been the result of multi-centre and multi-departmental collaborative research initiatives. Work is also evolving in the fields of soft tissue and skin tumours, neuropathology, forensic and renal pathology.

As itemised above there have been several important strides in the development of Pathology in the Tropics that emanated from work in Ibadan, either directly, or indirectly. Products of the medical school in every discipline from Ibadan went on to spawn or contribute to the development of other medical schools in every nook and cranny of the country as well as far away as Malawi. Socio-economic considerations, the political climate and the need for self-actualisation have driven several of the brightest stars to populate foreign climes in the Middle East, Europe, North America and more recently, East and South Africa, to the detriment of the development of just about every discipline, medical and non-medical, in the country. Spirited efforts by well-meaning technocrats, academics, and other concerned individuals and organisations, both national and international, appear to fall short of achieving results that would culminate in a significant reduction in the information and technological divide between developed and developing countries, particularly with respect to the development of science-based

disciplines. There is no doubt that Nigeria has the required number of brains to collectively make a meaningful impact. A large host of individuals of Nigerian origin have excelled in every discipline in literally every single country of the world. It behoves those who have the political will and wherewithal to ensure that education, science and medical care are properly funded. There is however, also an equally urgent need for all who find themselves in the position to guide or mentor junior colleagues to impress upon their wards, and to also themselves imbibe into their subconscious the important ideal that ***"it is not so much as what Nigeria can do for you as what you can do for Nigeria."***

ACKNOWLEDGMENTS

If I have indeed attained to any height, it is only by virtue of having stood tall on the shoulders of so many others. I first must give thanks once again and above all else to the Almighty God, for making this day possible. I cannot begin to adequately express my gratitude to my dear parents, Essien Udo Akang and Ima Akang (nee William Inyang) for the foundation they laid. I also cannot but acknowledge the import positive influence of my beloved siblings, stepmother, in-laws and every other member of my rather large extended family.

I am grateful to all my teachers, too numerous to mention, over the past forty years, including those who I continue to learn from even up till the present, my undergraduate and postgraduate students. The process of learning as every teacher well knows, never ends. Moreover, every so often, contrary to biblical injunction, one does encounter the exceptional student who bests his teacher.

I am also very grateful to all my dear friends. Please do not be offended if because of my inadequacies, I fail to specifically mention names. I say a big thank you to all those who from an early age inspired me to strive to attain excellence, which I saw mirrored in the achievements of those I was privileged to rub shoulders with. Reuben Ndubuisi Nkado, Ayodeji Harris-Eze, Osbert Egiebor, Osemwota and Nowamagbe Omoigui, Temitope Alonge, Olatunde Owoeye, Joseph Igbabasoria Ebhohimhen, Oritsematosan Akporiaye, Modupe Akinola, Louis Okeibunor Odeigah, Anthony Juwah, Margaret Wilson, Afolabi Ogunlesi, Paul Dienye, SK Nkor, 'Wole Olugboji and Olasupo Fatimilehin are just a few of those who come readily to mind. I am also grateful to my dear brothers and sisters in Christ, including the Senior Pastor of the Word Alive Ministry, Pastor Alex Adegboye, all the pastors of the ministry with whom I have come in contact and our numerous friends in all the different branches of the ministry. The spiritual nurturing and guidance provided by you all has helped me to keep my spiritual rudder aligned and provided a buffer to the great spiritual, emotional and physical challenges of daily existence.

I am also most grateful (I must emphasise) to all my past and present teachers, colleagues, friends and co-workers in the Department of Pathology. The list that has accumulated over the past 20 years again is rather daunting and so I crave your indulgence if because of my inadequacies, I have omitted any names. The following have been central to my academic and professional development. Professors PU Aghadiuno, TA Junaid, JO Thomas, JO Ogunbiyi, AM Adesina, Drs. Ikechukwu Livingstone Uzoaru, AO Odunfa, Moses Adeyanju, Hamidu Umaru Pindiga, Charles Amakiri, and Colonel Yawale Iliyasu.

I am also grateful to my numerous collaborators over the years. To name but two, because of time constraints, Professor Clement Adebayo Adebamowo and Dr. Iheanyi Okpala.

Finally, I am eternally grateful to my dear friend, companion and wife, Fidelia and to our two children, Michael and Joy for all the love, encouragement and forbearing they have shown over the years.

We began this lecture with a Bible passage. We shall close with another passage, which I dare say is quite familiar to all of you in the audience, whether you read the Holy Bible or the Holy Quran.

"Therefore let us also, seeing we are surrounded by so great a cloud of witnesses, lay aside every weight and the sin which so easily entangles us, and let us run with patience the race that is set before us"
Hebrews 12:1, KJV

I thank you very much for your kind attention.

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