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LETTER FROM THE EDITOR

We are in the times where knowledge increases, the old is giving way to the new and ancient landmarks are being questioned. Answers gotten from the quest to know more is reshaping the practice of modern medicine and pushing its frontiers to the impossible. This current edition of the Jos Journal of Medicine, Vol. 16 No 2, is poised to answer some of these question, why we do what we do, how some things are done and rare presentations in our practice.

Much gratitude goes to the dedicated team of JJM editorial for their endless sacrifices and work towards making this edition a success. Not forgetting our Editorial advisors who have shaped the work in our hands to be meaningful and of outmost value to our practice.

The publication team of JJM, your work and sacrifices are much appreciated. Having a team like you makes life and the work much easier.

We are most grateful to the Nigerian Association of Resident Doctors (NARD) who have been on the forefront of the fight for improved healthcare and service delivery for the population and the welfare of her members even as they carry out this noble task. The ARD JUTH Executives led by Dr. Noel Nnaegbuna have been very supportive of this work and we are most grateful for the trust bestowed on us.

This edition came to life because of the contributions of our authors who took it upon themselves to further and impact knowledge. And to you our faithful readers, your interest in medicine and your appetite for more knowledge would be met by this edition. We are most grateful for always being there. Our Journal is indexed in the African Journal Online (AJOL). Articles and other correspondences can be forwarded to us via mail at editorjjm@gmail.com.

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Content

RARE PRESENTATION OF FLORID VULVA WARTS – A CASE REPORT AND REVIEW OF LITERATURE

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ABSTRACT

Background: Condyloma acuminata is an extremely common cutaneous sexually transmitted disease often diagnosed clinically, on the basis of its warty, cauliflower, and verrucous appearance. It is caused by the "low risk" Human papillomavirus types 6 and 11 in 90 percent of cases. The immune system plays a critical role in determining the course of viral infection, with immune-suppression and advanced age increasing the risk for long term wart persistence. Treatment options include the use of a wide variety of topical medications as well as surgical excision by cauterisation.

Patient: A rare case of florid vulvar warts in a 21-year old nulliparous immuno-competent woman is presented and the literature reviewed. She had a 7-month history of progressive vulva swelling with associated itching, contact bleeding, and malodorous discharge. It measured about 14 x 10 cm in dimensions, occupying the posterior two-thirds of the labia majora and minora and obliterating the posterior commissure.

Intervention: There was no positive response to Podophyllin application, however,it was eventually excised and histologic analysis excluded malignancy.

Conclusion: Florid vulvar warts though rare in immune-competent patients, could occur. Patients with persistent and recurrent infection often require surgical procedures as was performed in our patient with the possibility of speedy recovery and restoration of normal anatomy and cosmesis.

Keywords: Florid vulvar warts, Human papilloma virus, Immunocompetent, Surgical excision, Case report.

Introduction

Genital warts are a cutaneous manifestation of the epidermotropic human papilloma virus (HPV) which has been divided into two general categories; the low risk benign HPV lesions and the high risk neoplastic HPV lesions.[1] The low risk types are implicated in genital warts, recurrent respiratory papillomatosis and low-grade cervical lesions, types 6 and 11 being the most often isolated strains.[1,2] They are, however, rarely associated with invasive squamous cell carcinoma of the external genitalia.[3]

The prevalence of genital human papillomavirus infection in sub-Saharan Africa is considered to be among the highest in the world and a pooled analysis on HPV prevalence surveys revealed that the highest HPV prevalence was seen in Nigeria.[4,5] The overall prevalence of high risk cervical HPV amongst women with normal cytology as obtained from the Human

papillomavirus and related diseases report in Nigeria is 3.5%,[6] although, a study conducted in Lagos University Teaching Hospital revealed that 36.5% of women attending gynaecology clinics in the facility were positive for high risk HPV.[7] Prevalence obtained from similar studies ranged from 9% in Jos,[8] 10% in Port Harcourt,[9] 26.3% in Ibadan,[10] and 37% in Abuja.[11] A study by Musa et al. in Jos, Nigeria, revealed a prevalence of 44.9% for high risk HPV among HIV positive women with normal cytology.[12]

Aside its predilection for persons of reproductive age, Human papilloma virus infections are notorious for their persistence and recurrence in individuals with chronic immune-suppression such as people living with HIV and AIDS, recipients of renal allograft, patients on prolonged steroid therapy, debilitating illness, or even pregnancy.[13-16] This fastidious virus, the prevalence of which has increased four-fold in the last two decades, is often aggravated by disease states in which cell-mediated immunity is suppressed.[17] The risk of infection is said to be inversely associated with CD4 cell count, HIV positive women being particularly at risk.[17-19]
Here we have described a case of florid vulvar warts in an immunocompetent woman.

Patient

A 21-year old heterosexual nullipara lady presented to the gynaecology clinic of our hospital on the 7th of July, 2021 with a 7-months history of progressively increasing vulval tumour. There was associated itching and malodorous vaginal discharge. She was HIV negative and had no history suggestive of other sexually transmitted diseases or immunosuppressive disease. She was seen earlier at another hospital where she was placed on Podophyllin ointment without improvement.

Examination revealed a young woman, not ill looking, with a pulse rate of 94beats/minute, blood pressure of 100/70mmHg. She had extensive cauliflower-like masses, diffused, involving the labia majora, posterior commissure, lateral aspects of the labia minora, and the introitus, with irregular borders. Colour was same as that of the adjoining skin. The growth measured about 14 x 10 cm. There was no propagation into the anal canal or into the vagina. There was no significant peripheral lymphadenopathy.

An assessment of florid vulval warts was made. The patient's packed cell volume was 40%, total white blood cell count – 6.0 x 10^9/L, Retroviral screening and VeneralDisease Research Laboratory test were non-reactive. Liver function tests, urea, electrolytes, and creatinine were within normal limits. Biopsy of the lesion confirmed condyloma acuminata.

She was admitted, counselled, and prepared for vulval warts excision and cauterisation.
Intra-operative findings were florid vulval warty growths, measuring about 14 x 10 cm, involving both labia majora, lateral aspects of the labia minora, the posterior fourchette, and obliterating the introitus.

The warty projections were excised and their bases cauterised using diathermy. Hemostasis was ensured, vulval lavage was done, and the wound dressed withsufratule. Post operatively, she had antibiotic therapy with Ceftriaxone and Metronidazole and she also had intramuscular Pentazocine for analgesia. She made remarkable recovery and was discharged 6 days postop. Subsequent follow up at the gynaecology clinic revealed a satisfactorily healed vulva with only minute areas of recurring warty growths. She commenced application of Podophyllin and within 3 weeks there were no more visible lesions. The histology result revealed vulval tissue with fibrovascular cores lined by keratinized stratified squamous epithelium exhibiting hyperkeratosis, parakeratosis, koilocytosis and acanthosis. There was no evidence of malignancy.

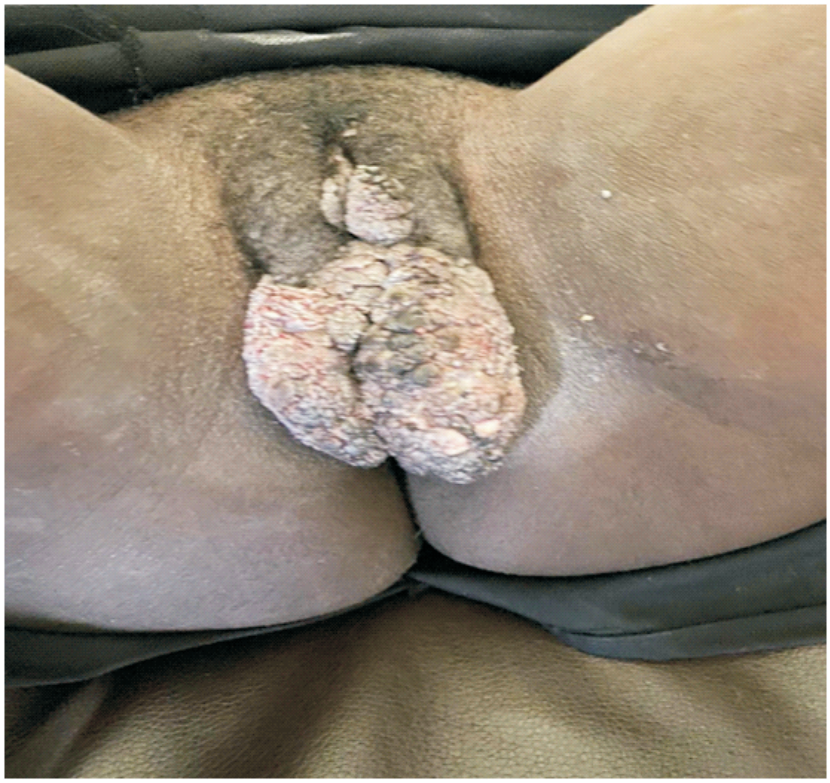

Figure 1: Florid VulvaWarts before Surgery

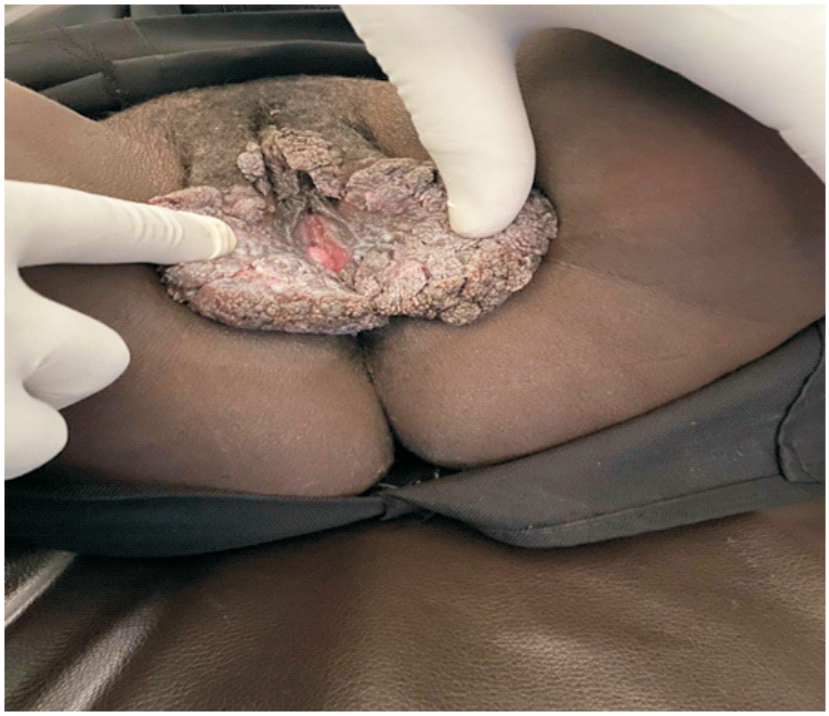

Figure 2: Florid vulval warts with narrowed introitus before Surgery

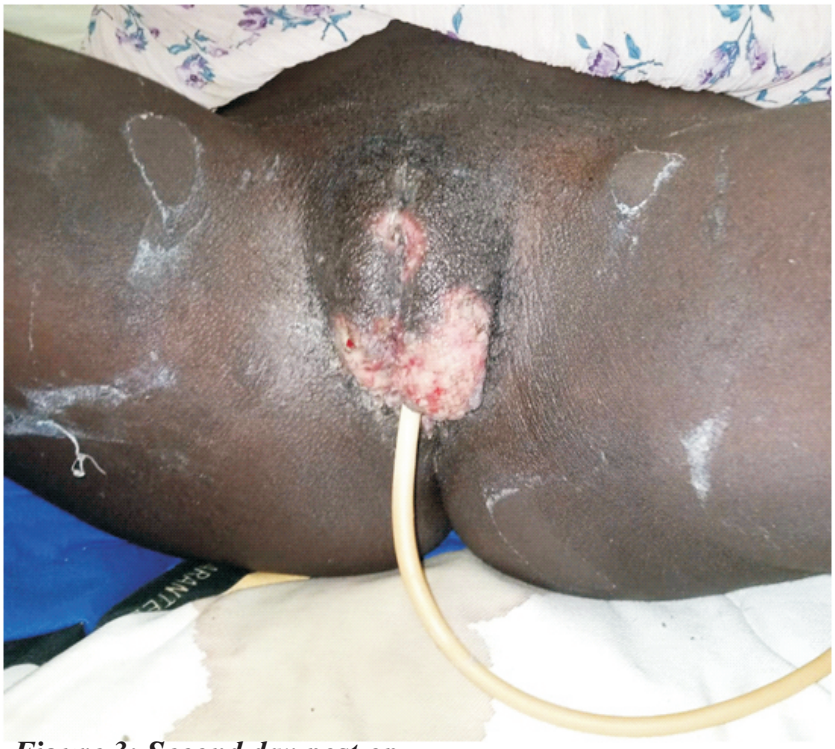

Figure 3: Second day post op

Figure 4: Three (3) months post op

Discussion

Condylomata acuminata, also known as anogenital warts represents a form of sexually transmitted disease caused by Human papilloma virus, arising more frequently in the vulvar and perianal regions as exophytic cauliflower-like masses causing symptoms such as itching, burning sensation, discomfort, pain, or bleeding during intercourse.[2,13,20] Risk factors include high number of sexual partners, men who have sex with men (MSM), a history of sexually transmitted infections, smoking, the use of oral contraceptives, high parity, and immunosuppression.[21-23] The recurrence and stigma associated with genital warts often have psychological ramifications, with feelings of shame, worry, fear, anger, and lowered self-esteem recorded amongst patients.[1,2,24] Itching was the predominant symptom in the case presented and the patient admitted to feeling shame and low self-esteem.

Several studies have shown that condyloma increases by expansion and autoinoculation of the virus into distant sites rather than by infiltration.[13,25] The clinical appearance of warts is variable and depends to some extent on the type of HPV involved and the anatomical site.[2,24] Genital warts could present as smooth or flat or keratotic warts. However, they more often appear hyperplastic, sessile or pedunculated, red or pink, sometimes forming soft exuberant masses, strangulated at their bases (Condylomataacuminata).[25,26] Large condyloma acuminata have rich blood supply and mild trauma on the surface may lead to severe bleeding that may be unresponsive to the routine methods of achieving hemostasis, such as pressure, ligation, or electric coagulation.[2] Biopsy, viral typing, acetowhite staining, and other diagnostic measures are not routinely required as the diagnosis of genital warts is primarily clinical.[3,27]

While genital warts can eventually resolve without treatment in an immune-competent host, the infection appears to be more common and worse in patients with various types of immunologic deficiencies.[1,25,28] Recurrence rate, size, discomfort, and risk of oncologic progression are highest among these patients.[1] The case presented was a rare situation where an immune-competent host developed symptomatic, florid and progressively worsening genital warts.

The goal of treatment is clearance of visible warts and amelioration of symptoms if present; some evidence suggests that treatment reduces infectivity, but there is no evidence that treatment reduces the incidence of cervical and genital cancer.[3]There are many therapeutic options, but none so far are superior to the others. The choice of treatment depends on the number, size, site, and morphology of lesions, as well as patient preferences, cost, convenience, adverse effects and clinicians experience.[3] Patient applied therapy such as Imiquimod cream or Podophyllin is increasingly recommended,[3] however, the use of Podophyllin, which is anti-mitotic in its action[2] in the case presented failed to yield desired results at the outset. Other treatment options such as cryotherapy, electro-desiccation, surgical excision, and carbon dioxide laser treatment may be employed with surgical excision having the highest success rate and lowest recurrence rate.[1]Surgical excision could be via tangential scissor excision, tangential shave excision, curettage, laser, or electrosurgery.[27] Likely complications of treatment include persistent hypo-pigmentation or hyper-pigmentation, depressed or hypertrophic scars or chronic pain syndromes (vulvodynia and hyperesthesia).[27]These were, however, not found in the patient.

Conclusion

Although genital warts can be treated with medications and surgery, they are serious public health concern as human papillomavirus has been associated with cervical cancer and other types of genital cancers.[8,16,24]Adequate treatment of patients is required to ameliorate symptoms and to prevent progression of the disease. Florid vulvar warts though rare in immune-competent patients, could occur. Patients with persistent and recurrent infection often require surgical proceduresas was performed in our patient with the possibility of speedy recovery and restoration of normal anatomy and cosmesis.[17]

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THE VITAL ROLE OF CANCER REGISTRIES IN CANCER CONTROL PROGRAM; WAKE-UP CALL FOR NIGERIA AND SUB-SAHARAN AFRICA

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ABSTRACT

Background: Cancer registry is an essential part of a balanced cancer control program that enables efficient planning and implementation of control program. Included as part of the resolution of World Health Assembly is a responsibility of Member States to establish population-based cancer registries. Africa particularly has sparse population-based cancer registration coverage. This paper aims to highlight cancer registries and the unique role it plays in cancer control and research, drawing attention to the need for an improved cancer registration in countries of Africa.

Methods: Relevant published literature on cancer registries in the past two decades were reviewed using different search methods.

Results: Cancer registration is essential for cancer control. It is cost-effective and assists countries of the world in setting priorities by identifying cancers with the highest burden, planning for emerging trends, focusing research where it is needed and allocating resources. Population-based cancer registries (PBCR) are the best option to measure and understand the cancer burden in the country by providing regional peculiarities and national estimates.

Conclusion: Countries in sub-Saharan Africa need a working cancer control program to help battle the ever-increasing burden of cancer. Establishing and maintaining a population-based cancer registry is feasible in all populations, even in low-resource settings, as well as improving both the quantity and quality, particularly in sub-Saharan Africa. It is critical for ensuring that cancer prevention and control interventions are making progress.

Keywords: Cancer Registries, Cancer Control Program. Wake-up Call, Nigeria, sub-Saharan Africa.

Conflicts of Interest: None declared.

Background

The cancer registry is an essential part of any balanced cancer control program. Cancer causes 1 in every 6 deaths globally, more than AIDS, tuberculosis and malaria combined.[1] It is an increasing problem in Africa and the number of new cancer cases will more than double between 2018 and 2040; faster than any other region of the world because of demographic changes.[2,3] The increase is likely to be even greater, given the ongoing urbanization of Africa, with associated changes in lifestyles.[4] Despite this growing burden, cancer continues to receive a relatively low public health priority in Africa, largely because of limited resources and other pressing public health problems, including communicable diseases such as Acquired Immune Deficiency Syndrome (AIDS)/Human Immunodeficiency Virus (HIV) infection, malaria and tuberculosis.

A Cancer Registry has been defined by the National Cancer Registry Association as an information system designed for the collection, management, and analysis of data on persons with the diagnosis of a malignant or neoplastic disease.[5]It forms the basis for national cancer control plans in all countries. Cancer registries collect cancer-related information such as: demographics**,** medical history**,** diagnostic and prognosis indicators**,** treatment patterns, cancer recurrence, survival rates, health care insurance coverage, and patient eligibility for clinical trials. Successful Cancer Registries use healthcare analytics technology that goes beyond data collection and data warehousing, play crucial role in advancing care and research. They acquire various data using leading technology and standards, assemble the data into real-world evidence using advanced analytics and data science, enable various users to act on the evidence using various decision-making tools.[6]

There is an increasing global recognition of the need for high-level investment in the control of cancer alongside other major non-communicable diseases (NCDs). The Seventieth World Health Assembly (WHA) held on 30th May, 2017, and governments from around the world adopted a resolution in response to the growing burden of cancer. Cancer is currently responsible for one in three premature deaths globally, ranking above infectious and parasitic diseases, cardiovascular diseases, intentional and unintentional injuries.[7] To fight cancer burden, the extent of the cancer must be known to enable efficient planning and implementation of programs for cancer control. The World Health Organization (WHO) has promoted the development of national cancer control program to reduce cancer incidence and mortality and improve the quality of life of cancer patients in individual countries and states. This is accomplished through the systematic and equitable implementation of evidence-based strategies for prevention, early detection, treatment and palliation, and making the best use of available resources. The need for a functional cancer surveillance system is evident in all documents relating to cancer control planning, as is the essential role of cancer registries in the context of low- and middle-income countries. The WHA passed a resolution on cancer prevention and control. All WHO Member States especially developing countries, were called upon to intensify action against cancer by developing and reinforcing cancer control programs, developing or maintaining national cancer registry containing the type and location of the cancer and its geographical distribution.[8] Furthermore, the 2017 cancer resolution builds on the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020 and the United Nations Sustainable Development Goals 2015–2030, which include the target (SDG 3.4) to reduce premature mortality from NCDs by one third by 2030. Included as part of the resolution is a responsibility of Member States to establish population-based cancer registries to inform planning. As part of concerted fight against cancer scourge, this paper aims to highlight cancer registries and the unique role it plays in cancer control and research, drawing attention to the need for an improved cancer registration in countries of sub-Saharan Africa.

Methods

Relevant published literature on cancer registries in the past two decades were reviewed using different search methods.

Given the changing landscape of cancer burden and cancer surveillance, the International Agency for Research (IARC) established the Global Initiative

for Cancer Registry Development (GICR) in 2011, as a coordinated multi-partner approach to improving the availability of the data necessary to drive policy and reduce the burden and suffering due to cancer. The GICR works through a group of Regional Hubs, which are tasked with providing expertise and support to registries in their respective regions. In 2012, the African Cancer Registry Network (AFCRN) was formally inaugurated as a consortium of registries with a defined set of membership criteria. In the same year it became the Regional Network Hub for Sub-Saharan Africa (SSA). The AFCRN expanded the activities of its predecessor, the East African Cancer Registry Network (EARN), which was established in January 2011. The AFCRN is a project of the Cancer Registry Program of the International Network for Cancer Treatment and Research (INCTR) which aims to improve the effectiveness of cancer surveillance in sub-Saharan Africa by providing expert evaluation of current problems and technical support to remedy identified barriers, with the long-term goals of strengthening health systems and creating research platforms for the identification of problems, priorities, and targets for intervention.[9] Cancer surveillance is essential to informing governments about cancer incidence and mortality, the impact of cancer control strategies and program and, more broadly, efforts towards the realization of Universal Health Coverage (UHC). Since the adoption of the WHA resolution, the International Agency for Research on Cancer (IARC) and the Union for International Cancer Control (UICC), together with the International Cancer Control Partnership (ICCP), a group of organizations working to advance cancer control, are stepping up efforts to support the development, implementation and evaluation of national cancer control plans (NCCPs), informed by robust cancer surveillance data. The Global Initiative for Cancer Registry Development (GICR) was launched by IARC in 2011 as a partnership with UICC and other international organizations.[9,10] The overall objective of GICR is to coordinate actions to strengthen cancer surveillance data through increasing the availability and quality of population-based cancer registry (PBCR)information on the incidence, characteristics, and outcome of cancer. By doing so, GICR aids governments in obtaining the information needed to guide national cancer planning efforts, and the World Health Organization with a mechanism for supporting Member States in measuring cancer incidence as a core indicator within the Non-Communicable Disease Global Monitoring Framework.

At present, there are more than 700 cancer registries worldwide. Only about 21% of the world's population is covered by population-based cancer registries, with particularly sparse registration coverage in Asia (8% of the total population) and 11% in Africa.[12] Although, WHO reported that 60% of the 46 countries of sub-Saharan Africa (members of the African region of the World Health Organization) had population-based cancer registries in 2015,[4] in January 2019 only 24 countries had registries that met minimum criteria for completeness of cases ascertainment (> 70% of the cases expected in the area being registered), hence, qualified as members of AFCRN.[4]

Types of Cancer Registries include:

Hospital based cancer registry

A hospital registry is the monitor of the cancer program at a particular health care facility. They are primarily institution-based. All patients diagnosed or treated at the hospital are entered into the Cancer Registry database. The data are used to improve patient care by assessing patterns of care and outcomes relative to national norms. Registry data allows the hospital to measure their quality of care for continuing improvement. The data are aggregated with state and national data, and is used to educate staff and determine resource allocation.[11,13]

Population based cancer registry

Population-based cancer registries (PBCRs) seek to collect data on all new cases of cancer occurring in a well-defined population. Usually, the population consists of the residents in a particular geographic region.[13] The main objective of population-based cancer registries is to provide statistics on the occurrence of cancer in that population and to provide a framework for assessing and controlling the impact of cancer in

the community. While hospital-based and special registries may contribute data to PBCRs, they have fundamental differences in their core functions and are not a substitute for them.[14]

Specialized cancer registry

Specialized registries collect and maintain data on a particular type of cancer. An example is the Gilda Radner Familial Ovarian Cancer Registry,[15] which collects cancer information on families with ovarian cancer.

State cancer registry

State registries collect and maintain data on cancer occurring at the state level within the country.

National cancer registry

National registries collect and maintain data from the state cancer registries. Healthcare providers record patient information and diagnosis. Hospital-based cancer registrar abstracts patient information into uniform data sets and checks for an existing record for each, patient data are aggregated on a state level, and then sent to national registries (SEER or NPCR)

Core Functions of Cancer Registry

Case finding: This is the process of finding all eligible cases for inclusion in the cancer registry.

Abstracting: The process of collecting all required data elements from electronic or paper-based resources from a patient's record and converting it to uniform data.

Follow up: The process of continuous surveillance of the patient and their cancers to determine on-going cancer management, recurrence, treatment and survival status.

Reporting: The process of reporting to the central cancer registry (monthly), or national cancer databases (annually).

Uses of Cancer Registries

Registries can serve many purposes and provide value for a variety of healthcare stakeholders. It is an invaluable tool for evaluating cancer control programs and policies for a reduced cancer burden in a community.

Physicians and other healthcare professionals use cancer registries to evaluate available treatments, procedures, and therapies, and to understand how patients with different characteristics respond to various treatment.[8] Pharmaceutical companies and developers including medical device manufacturers use cancer registries to track and understand the effectiveness, safety, and value of medical devices or therapies and drugs entering or in the market. Researchers and developers use registry data as the foundation for registry-enhanced or registry-based research, clinical trials, or post market surveillance studies. Cancer patients share timely and personal data about their conditions and outcomes, and gain greater understanding of their care that leads to informed shared decision-making. Registries aid guideline development and help improve cancer prevention, research, and care; improves quality of life of patients with cancers and aid the implementation of procedures for improvement. Cancer registries provide information for decision support and cancer prevention activities and informs allocation of resources at local, state, and national levels. It equally guides educational program development for healthcare providers, patients, and the general public as well as offers career opportunity for cancer registrars. Cancer registries are notably useful sources of information on the burden of disease in a given population by providing information on incidence, mortality, and survival and less commonly on prevalence and disability adjusted life years (DALYs). Other important uses of cancer registry data include descriptive studies and analytical research into the etiology and risk factors of specific cancers. Finally, cancer registries form part of the body of knowledge used by medical professionals, epidemiologists, policymakers, and public health officials and is a form of population surveillance.

Standard Setting Agencies Guiding Cancer Registry Functions

A. National Program of Cancer Registries (NPCR) established in 1992, provides national leadership to Cancer Registries. Today, NPCR and SEER registries work collaboratively to collect and report cancer statistics on the entire U.S population. NPCR offers multiple

educational and networking opportunities: annual national conference to build knowledge and expertise, promotion of professional standards and ethics, management of the CTR process and NCRA's Council on Certification, publication of a peer-reviewed scientific journal and a quarterly newsletter, web site offering a wide range of publications and information about educational opportunities.

B. Centers for Disease Control and Prevention (CDC):CDC has established national standards to ensure the completeness, timeliness, and quality of Cancer Registry data.
C. The International Cancer Control Partnership (ICCP) is a group of international organizations engaged in cancer control planning efforts. The Partners are seeking to create synergies to maximize collective resources and efforts to support the development, implementation and evaluation of national cancer control plans.
D. World Health Organization
E. Global Initiative for Cancer Registry Development (GICR)
F. African Cancer Registry Network
G. CanReg5 Webinar Series (IARC)

History of Cancer Registration in the World and Africa

The registration of cancer cases began with several unsuccessful attempts at cancer surveys in the United Kingdom in 1728, Germany in 1900, and the Netherlands and Spain in 1902 and 1908, respectively.[16] After several sporadic attempts at population-based cancer registration in Germany in 1926, USA, Denmark, England, and Canada in 1940s,[17] the need for the establishment of cancer registries throughout the world was recommended to the World Health Organization (WHO) by leading experts in the field of cancer control.[17] A few years later, the WHO established a subcommittee mandated to proffer recommendations for the establishment of cancer registries. The specialized arm of the WHO that deals with cancer, the International Agency for Research on Cancer (IARC) was formed in 1965 and the following year, the International Association of Cancer Registries (IACR) was founded.[16, 18] The IACR and IARC through their activities have promoted the development of cancer registration in many developing regions including SSA.

Cancer registration in Africa began in 1950s with registries in South Africa, Uganda, Nigeria, and Zimbabwe. These African registries contributed cancer incidence data to the WHO/IARC Cancer in five Continents (CIV) publications; Mozambique: Lorenco Marques, Nigeria: Ibadan, South Africa: Johannesburg, Bantu and Uganda: Kyadondu (Volume 1); South Africa: Cape Province, South Africa: Johannesburg, Nigeria: Ibadan, Zimbabwe: Bulawayo (Volume 2); Nigeria: Ibadan, and Zimbabwe: Bulawayo (Volume 3), until the late 1970s and 1980s when an economic recession and accompanying "brain drain" spread throughout Africa. Since then other registries that have contributed to subsequent CIV volumes include registries Dakar Senegal, Mali, The Gambia, and Harare Zimbabwe. Although, many African registries submit data for the CIV publication, data quality issues usually result in a good number of submissions being screened out. However, over the last decade, there has been a gradual reawakening of the need for cancer registries that can generate high-quality data with a resultant increase in the number of IARC acknowledged PBCRs (member registries of the African Cancer Registry Network) in Africa (ACRN). Countries like Nigeria, Kenya, Tanzania, Uganda, and Zimbabwe, have increasing cancer registries that are indispensable. These registries submit their cancer reports regularly and some registry members even sit on the NCCP board for making policies for their countries.

Cancer Registration in Nigeria

Nigeria, the most populous country in Africa with a population of approximately 168 million people represents over 50% of the population of the West African sub-region and slightly <20% of the population of Africa.[19] In Nigeria, cancer registration began in 1960 with the first cancer registry located within the Pathology Department of the University College Hospital, Ibadan, in South Western Nigeria. Cancer incidence data from this registry were included in the first three volumes of Cancer Incidence in five continents (CIV) for the time periods 1960–1962, 1960–1965, and 1960–1969.[20]

Although, cancer registration began decades ago in Nigeria, progress over the past 50 years has been slow, patchy, and halting. Previous efforts at achieving quality population-based cancer registries have not been sustained. With the advent of democratic rule in Nigeria and improvements in public health financing and management, there has been a renewal of interest in cancer registration. In 2009, the Nigerian FMOH, Society of Oncology and Cancer Research of Nigeria and the Institute of Human Virology Nigeria (IHVN) conceptualized the Nigerian National System of Cancer Registries (NSCR) as a method for generating cancer incidence data that covers different sections of the country. The main objective of the NSCR is to provide training, capacity development, mentoring, technical, and scientific support to cancer registries in Nigeria to enable them attain population-based cancer registration status and generate high-quality cancer incidence, treatment, and survival data for the country.

There are 20 Hospital-based cancer registries (HBCR) in Nigeria: Ahmadu Bello University Teaching Hospital, Zaria (ABUTH) Cancer Registry, Aminu Kano Teaching Hospital, Kano (AKTH) Cancer Registry, Federal Medical Centre, Abeokuta Cancer Registry, Federal Medical Centre, Keffi Cancer Registry, Federal Medical Centre, Gombe Cancer Registry, Federal Medical Centre, Lokoja Cancer Registry, Federal Medical Centre, Owo Cancer Registry, Federal Medical Centre, Yenagoa Cancer Registry, Imo State University Teaching Hospital, Orlu (IMSUTH) Cancer Registry, Jos University Teaching Hospital, Jos (JUTH) Cancer Registry, Lagos State University Teaching Hospital, Ikeja (LASUTH) Cancer Registry, Lagos University Teaching Hospital, Surulere (LUTH) Cancer Registry, Nnamdi Azikiwe University Teaching Hospital, Nnewi (NAUTH) Cancer Registry, Obafemi Awolowo University Teaching Hospital, Ile-Ife, (OAUTH) Cancer Registry, Rivers State University Teaching Hospital, Orogbum, Port Harcourt Cancer Registry (formerly Braithwaite Memorial Specialist Hospital Cancer Registry), University of Benin Teaching Hospital, Benin (UBTH) Cancer Registry, University of Ilorin Teaching Hospital, Ilorin (UITH) Cancer Registry, University of Port Harcourt Teaching Hospital, Port Harcourt (UPTH) Cancer Registry, University of Maiduguri Teaching Hospital, Maiduguri (UMTH) Cancer Registry, and University of Uyo Teaching Hospital, Uyo (UUTH) Cancer Registry.[19]

The NSCR coordinates the activities of the cancer registries and generates aggregate national cancer incidence, treatment, and survival data; disseminate the data to relevant government agencies for use in policy formulation and resource allocation; to scientists conducting cancer research; and to the public for education, awareness, and advocacy purposes. The NSCR also advocates for cancer registration in the country, increase awareness of cancer, advocate, and publish locally relevant cancer data. In order to achieve these objectives, NSCR works to strengthen existing cancer registries, establish new registries through the provision of training, mentoring, computer hardware and software, and provide support for data management.

Population Based Cancer Registries (PBCR) in Nigeria

There are thirteen population-based cancer registries (PBCR*) in Nigeria.*[19]

Ibadan Cancer Registry (IBCR): The first Cancer Registry in Nigeria established in 1962, located within the Department of Pathology at the University College Hospital, Ibadan. Cancer incidence data from this registry were published for the time periods 1960- 1962, 1960- 1965, and 1960- 1969 in the first three volumes of Cancer Incidence in 5 Continents (CIV). IBCR became defunct in 2002, but was revived in 2009. Data from this registry has been presented in the first 3 volumes of the Cancer in 5 continents publication by IARC (CIV), the IARC scientific publication No. 153, Cancer in Africa and also in GLOBOCAN 2012 where data from this registry along with the Abuja and Calabar PBCRs were used to derive national estimates for Nigeria.

Abuja Cancer Registry (ABCR): The Abuja Cancer Registry started operation as a hospital-based registry in 2006. It is situated in the National Hospital Abuja in Nigeria's Federal

Capital Territory (FCT). With the collaboration of Federal Ministry of Health and the Nigeria National System of Cancer Registries, it graduated to become a population-based cancer registry in January 2009. The registry falls under the Oncology Department and the Medical Records Department. Both departments are important stakeholders (AFCRN CIA III, 2019). The Registry is population-based for Abuja City and Abuja FCT. The registry utilizes the sources of information available at the hospital including, pathology laboratory, medical records department, oncology department and in-patient wards, and out-patient clinics and employs both active and passive methods of case-finding. Data are also collected from 9 hospitals (both public and private) in the FCT. Four pathology laboratories also supply pathology reports to the registry. Registry staff visit departments and units in the nine hospitals to register cases from the Oncology departments, in-patient wards and out-patient clinics. All cancer cases that are identified at the various sources of information are registered, including those in non-residents. Non-resident cases are however excluded from the analysis. Death certificates are accessed and abstracted. Data are recorded on the cancer registry abstract form. The CanReg 4 system is used for data processing and management.[11]

Other population-based registries in Nigeria include: Enugu Cancer Registry (ECR), established in 1988 as a hospital-based cancer registry, Sokoto Cancer Registry (SCR), established in 2013, Ekiti Cancer Registry, Kebbi Cancer Registry, Calabar Cancer Registry, Asaba Cancer Registry, Ijebu Cancer Registry. Presently, a total of 30 cancer registries in Nigeria are members of NSCR. These include: 10 population-based cancer registries (PBCR) and 20 hospital-based cancer registries (HBCR).[19] Data from Cancer Registries across the country, as reported by the Nigerian National System of Cancer Registries (NSCR), has been very useful in the formulation of evidence-based cancer control policies and programs. The activities of NSCR have improved cancer research in Nigeria and have been a reliable source of epidemiological data from Nigeria to GLOBOCAN, the global Cancer research agency.[19]

Recommendation

Successful implementation of cancer registration is essential and improving both the quality as well as quantity of population-based registries in Africa is critical in ensuring that cancer prevention and control interventions are on course. This requires cooperation of many stakeholders in the health and non-healthcare sectors, including private and public oncology care and pathology services providers, medical records, vital statistics, community leaders, patients, and government officials. To obtain effective coordination of cancer registration, all stakeholders involved must work together. The primary healthcare system needs to be fully functional for successful establishment and sustenance of population-based cancer registries which are the best option at measuring and understanding cancer burden in a country by providing national estimates.[30] Advocacy at the level of the hospital is particularly instrumental in ensuring sustainability of the program. Engaging heads of institutions, heads of medical records, and cancer registry directors is crucial to generating much needed local support for the cancer registries. Hospitals need be mandated to set up Cancer Registry Management Committees that can oversee the function and administration of cancer registries. These committees can advocate to hospital management, government, and society on behalf of cancer registries. Often identified as integral to the success of any cancer registry is the leadership of the registry. The director of a cancer registry is expected to play a supervisory role, be involved in monitoring the activities of the cancer registrars particularly as regards data abstraction and recording as well as possess the ability to engage all stakeholders with skill, diplomacy, and tact. Registries in institutions where the leadership is interested in cancer registration have often fared better than those where this is lacking. In most institutions where the cancer registry staff is deployed from the medical records department and may be rotated out of the registry after they have undergone several cancer registry trainings with new persons brought in with no knowledge of cancer registration principles or use of the relevant software, this scenario can be prevented by securing the support of the head of the medical records department.

Conclusion

Cancer registries are at the core of the global monitoring framework of non-communicable diseases-cancer. It plays a vital role in the collection of important data about each new patient diagnosed with cancer and is treated. Many healthcare givers and researchers utilize the high-quality data that can be found in Cancer registry in order to conduct research and for the analysis of patients and their disease. It is cost-effective and assists countries of the world in setting priorities by identifying cancers with the highest burden, planning for emerging trends, focusing research where it is needed, and allocating resources. It is an invaluable tool for the evaluation of cancer control program. It is hoped that GICR and AFCRN can help to measurably improve the availability and quality of cancer registry data in sub-Saharan Africa in the coming years, so that the surveillance map of a decade from now will be a clear advance on what we observe today.

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HISTOLOGICAL TYPES OF CERVICAL MALIGNANCIES SEEN AT THE JOS UNIVERSITY TEACHING HOSPITAL: A FIVE YEAR RESTROSPECTIVE REVIEW

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ABSTRACT

Background
Cancer of the cervix is the most common gynaecologic malignancy and the fourth most frequent cancer in women worldwide.

Objectives
To determine the pattern and histological types of cervical cancer in Jos University Teaching Hospital (JUTH).

Material and Methods: This is a 5-year retrospective (January 2016 To December, 2020) study of all cervical cancers diagnosed at the Anatomical Pathology Department of JUTH.

Results: Within the 5 years' period (January 2016 To December, 2020), a total of 120 cases of cervical cancers were recorded in JUTH. Of these, Squamous cell carcinoma predominated with 95(79%) of the cases, adenocarcinoma 14(12%) cases, and adenosquamous 11 (9%) cases. Patients' ages ranged from 20 to 90 years with highest occurrence in the 4th and 7th decades, with aa mean of 53.5±10.1 years.

Conclusion: Squamous cell carcinoma is the commonest gynaecological malignancy distantly followed by adenocarcinoma in our study. This is consistent with most studies in Nigeria and Africa but less common in the developed world and afflicts more of the older age group.

Keywords: cervix, cancer, squamous cell carcinoma, histology, pattern, adenocarcinoma

INTRODUCTION

Cancer of the cervix is the most common gynaecologic malignancy and the fourth most frequent cancer in women worldwide.[1] Most of these cancers stem from infection with the human papillomavirus (HPV), although, other host factors affect neoplastic progression following initial infection.[2] HPV is the primary etiologic infectious agent associated with cervical cancer although other sexually transmitted factors, including herpes simplex virus[2], may play a concurrent causative role.[1,2,4]Ninety-nine point seven percent of cervical cancers are associated with an oncogenic HPV subtype.[1,2] In one study, 57 percent of invasive cervical cancer cases were attributable to HPV serotype 16. Serotype 18 was associated with 16 percent of invasive disease cases.[5,6]Each of these serotypes can lead to either squamous cell carcinoma or adenocarcinoma of the cervix.[5,6] However, HPV 16 is more commonly associated

with squamous cell carcinoma of the cervix, whereas HPV 18 is a risk factor for cervical adenocarcinoma. Lower educational attainment, older age, having multiple sexual partners, immuno suppression, long-term use of combined oral contraceptives, high parity, smoking, and poverty are risk factors cervical cancer.[1,3,4,5] Specifically, those living in impoverished neighborhoods have limited access to testing and may benefit from screening outreach programs.[11]

Immuno suppressed women have an increased risk of developing cervical cancer. Cervical cancer is an acquired immune deficiency syndrome (AIDS)-defining illness.[1,2] Women with autoimmune disease who use immuno suppressants do not appear to have an increased cervical cancer risk, except for azathioprine users.[1,2,3,4]In general, progression from dysplastic to invasive cancer requires several years, although, duration can vary widely.[1,2]

Amplification of viral replication and subsequent transformation of normal cells into tumor cells may follow infection with oncogenic HPV strains.[1] Specifically, the viral gene product E6 and E7 oncoproteins are implicated in this transformation.[1,2] E7 protein binds to the retinoblastoma (RB) tumor suppressor protein, whereas E6 binds to the p53 tumor suppressor protein.[1,2] In both instances, binding leads to degradation of this suppressor protein.[1]The E6 effect of p53 degradation is well studied and linked with the proliferation and immortalization of cervical cancer cells.[1] It is observed that HPV infections occurs mostly in sexually active women with 90% clearing spontaneously within months.[2,7] Infected cells in the cervix could progress into premalignant lesions known as 'cervical intraepithelial neoplasm (CIN) graded as CINI, CIN2 and CIN3, eventually carcinoma in-situ and invasive cervical cancer via a multistep process.[2,7]

The two most common histologic subtypes of cervical cancer are squamous cell and adenocarcinoma.[1,2,3] Of these, squamous cell tumors predominate, comprising about 70 percent of all cervical cancers, and arise from the ectocervix.[1] Over the past 30 years, the incidence of squamous cell cancers has declined, whereas that of cervical adenocarcinoma has risen.[1,2,3] These changes may be attributed to an improved method of screening for early squamous lesions of the cervix and an increase in HPV prevalence.[1] Squamous cell carcinomas can be subdivided into keratinizing and non-keratinizing carcinomas.[1,2,3,4]

In contrast to squamous cell cervical carcinoma, adenocarcinomas make up 25 percent of cervical cancers and arise from the endocervical mucus-producing columnar cells.[1,2] Because of its origin within the endocervix, adenocarcinomas are often occult and may be advanced before becoming clinically evident. They often give the cervix a palpable barrel shape during pelvic examination.[1,2,3,4]

Adenocarcinomas exhibit various histologic patterns composed of diverse cell types.[1,2] Of these, mucinous adenocarcinomas are the most common.[1,2] The mucinous endocervical type retains resemblance to normal endocervical tissue.[1,2,3] The intestinal type resembles intestinal cells and may include goblet cells.[1,2,3]Minimal deviation adenocarcinoma, also known as adenoma malignum, is characterized by cytologically bland glands that are abnormal in size and shape.[1,2] These tumors contain an increased number of glands positioned at a deeper level than normal endocervical glands.[1,2] Women with Peutz-Jeghers syndrome are at increased risk of developing adenoma malignum. Villoglandular adeno-carcinomas are made up of surface papillae.[1,2,3]

Endometrioid adenocarcinomas are the second most frequently identified and display glands resembling those of the endometrium. Serous carcinoma is identical to serous carcinomas of the ovaries or uterus and is rare.[1,2]Clear cell adenocarcinomaaccounts for less than 5 percent of cervical adenocarcinomas and is named for its clear cytoplasm. Rarely, adenocarcinomas arise in mesonephric remnants in the cervix and are termed mesonephric adenocarcinoma.[1,2,3,4,5]

Jos University Teaching Hospital (JUTH), Plateau State is one of the tertiary Health Centers offering histopathology services in the state with an estimated population of 3.5 million people. This study examines the pattern and histological types of cervical cancers in JUTH and compares it with other parts of the country and the world in general.

METHODOLOGY

Study design:
This was a retrospective review of histopathology report of cervical specimen obtained at surgery during the study period.

Study Population:
Women who had cervical cancers within the last five years as confirmed by the histopathology department of the Jos University Teaching Hospital.

Sample Size:
This is a retrospective review of 120 histologically confirmed cases of cervical malignancies diagnosed at the department of histopathology JUTH.

Department of study:
Histopathology department of the Jos University Teaching Hospital.

Ethical Consideration:
Permission for the study was obtained from the Ethical and Research committee of the Jos University Teaching Hospital and Histopathological Department of the same institution

Sample Collection:
Data was obtained for this study using records of results of patients in the department of histopathology of JUTH over the last five years.

Data Analysis:
Data was analyzed descriptively using EPI info. Descriptive analysis using the simple bar chart, frequency distribution.

RESULTS

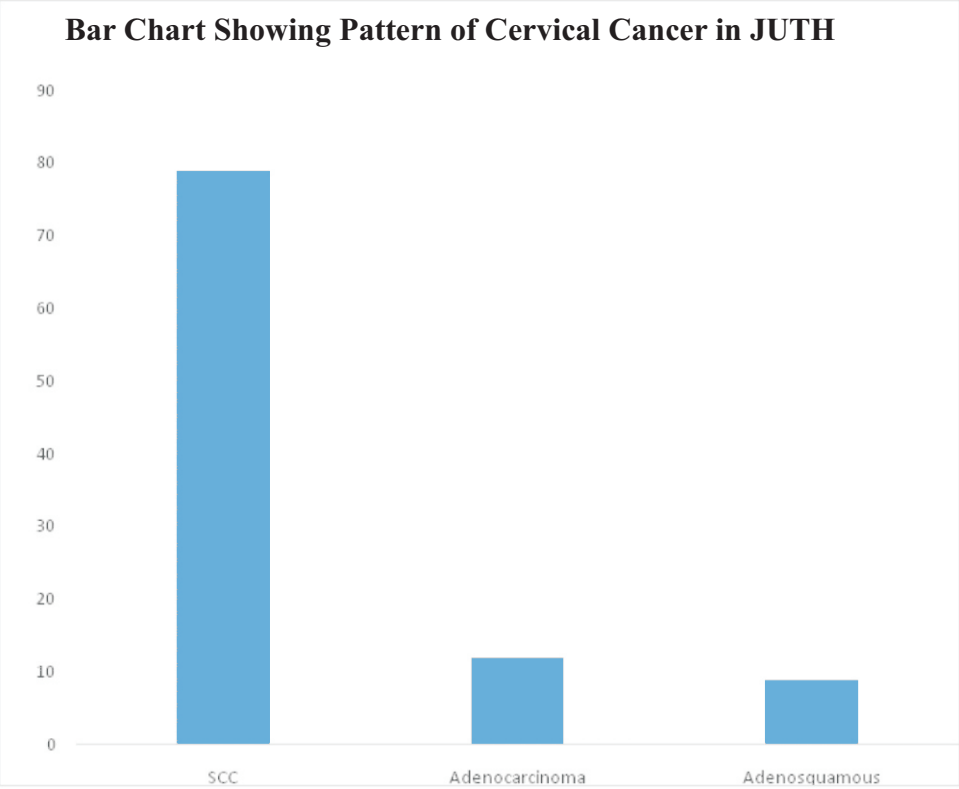
Within the 5 years' study period (January 2016 To December, 2020), a total of 120 cases of cervical cancers were recorded in JUTH. Of these, Squamous cell carcinoma predominated with 95(79%) cases, adenocarcinoma 14(12%) cases, and adenosquamous 11 (9%) cases.
Patients age ranged from 20 to 90 years with highest occurrence in the 4th and 7th
decades with mean of 53.5±10years.

Table 1 showing the age distribution of cervical cancer in JUTH from January, 2016 to December, 2020.

Age group (years)	Frequency (N = 120)	Percentage %
21 – 30	2	2
31 – 40	21	17
41 – 50	28	23
51 – 60	31	26
61 – 70	25	21
71 – 80	12	10
81 – 90	1	1
Mean age	53.5 ± 10	100

Table 2:Showing the pattern of cervical cancer in JUTH from January 2016 to December, 2020.

Histologic type	Frequency (N = 120)	Percentage %
SCC	95	79
Adenocarcinoma	14	12
Adenosquamous	11	9
	120	100



DISCUSSION

A total of 120 cases of cervical cancer were encountered over a 5-year period. This gave an average of 24 cases per year and similar findings were documented in BSUTH with 25.6 per year.[3] The mean age of the women in this study was53.5±10.1 years which corroborated with other Nigerian studies (Table1),44.5 years in Maiduguri, 42years in Ibadan, 48years in Sokoto, 49.5years in Abuja, and 47.5 in BSUTH. Findings in other parts of the world were as shown, 49years in Ethiopia, 50years in England, and 51.4years in the USA.[1,2,3,7,10,12.] In this series, squamous cell carcinoma was by far the most common histological variant (Table 2) accounting for 79% (95cases). Similar figures were documented in previous studies done in BSUTH 79%, UDUTH 80%, Lagos 92%, Port-Harcourt 90.2%, Nnewi 92.3%, and Benin 89.3%. Squamous cell carcinoma is also higher in Gabon 90% and England 70%.[7,10,12] Generally, the incidence of squamous cell cancers has declined, whereas that of cervical adenocarcinoma has risen. These changes may be attributed to an improved method of screening for early squamous lesions of the cervix and an increase in HPV prevalence.[1] Adenocarcinoma was the second most common histological variant in this study accounting for 12% of cervical cancers in JUTH. This is relatively small but consistent with the study done in BSUTH where cervical adenocarcinoma account for 10% of cervical cancers and slightly higher than the 6%

previous study in Benin City.[1,3,9]

Generally, other histological variants of cervical cancers seen in contrast to squamous cell cervical carcinoma, adenocarcinomas generally make up 25 percent of cervical cancers and arise from the endocervical mucus-producing columnar cells. Because of this origin within the endocervix, adenocarcinomas are often occult and may be advanced before becoming clinically evident.[1,2] In this study, adenosquamous carcinoma constituted 9% of cervical cancer.

The study shows that 66% of cervical cancers occurs between the 3rd and 5th decade which represent the most sexually active group and is consistent with findings in other parts of the country where most patients fell within the 40-69 years age bracket.

In conclusion, squamous cell carcinoma constitutes the highest histologic type of cervical can accounting for 79% of cervical cancers. 66% of these cancers occurs between the 3rd and 5th decades.

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MRI VISUAL RATING OF COGNITIVE IMPAIRMENT IN ELDERLY PATIENT

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ABSTRACT

Background:
Neurocognitive impairment is an acquired deficiency of cognitive abilities that significantly interferes with performance of daily activities. Early diagnosis is key in the management which is dependent on employing appropriate biomarkers. Cerebral atrophy is a valid neuroimaging biomarker. This study aims to correlate cerebral atrophy using standard visual assessment scales on Magnetic Resonance Imaging (MRI) with cognitive status using a standard cognition assessment tool in elderly patients at the University College Hospital, Ibadan Nigeria.

Methods:
Patients over 60 years who presented for cranial MRI and met the inclusion criteria were recruited into the study which spanned a 10-month period. Relevant demographic and clinical information were obtained from the participants. Visual rating scores comprising Medial Temporal Atrophy (MTA), Fazekas, Koedam and Global Cortical Atrophy (GCA) of the images were entered into a standard proforma and the Statistical Package for the Social Sciences (SPSS) software version 20. Data was analyzed using chi square, student t-test, Spearman Rho test, Kruskal-Wallis test, Mann-Whitney Wilcoxon test, and logistic regression analysis.

Results:
Spearman Rho test showed significant association between MTA and Fazekas scores and between Koedam and GCA scores. Significant association between MTA scores and severity of cognitive impairment by Mann-Whitney Wilcoxon test was shown. Kruskal-Wallis showed significant association between Fazekas scores and severity of cognitive impairment.

Conclusion:
Medial temporal lobe atrophy is a useful marker of cognitive impairment and severity of cognitive impairment. White matter disease is significantly associated with the presence of and severity of cognitive impairment. Both can serve as useful neuroimaging biomarkers.

Keywords
Atrophy,brain,cognitive impairment,elderly,medial temporal lobe, MRI.

Introduction

Neurocognitive impairment is acquired deterioration in cognitive abilities and in the mental faculties that impair the successful performance of daily activities.[1] These cognitive abilities include memory, language, visuo-spatial ability, calculation, judgment, problem solving skills, orientation, registration, attention among others. Memory is the most common cognitive ability loss with neurocognitive impairment.[1] According to the Diagnostic and Statistical Manual of Diseases-5 (DSM-5), neurocognitive impairment is synonymous with dementia and it is currently preferred to dementia- latin word for 'mad' or 'insane'.[2] Dementia is stigmatizing and unacceptable to patients.

Alzheimer's disease, vascular neurocognitive impairment, frontotemporal neurocognitive impairment, Huntington's neurocognitive impairment, neurocognitive impairment with Lewy bodies, neurocognitive impairment associated with Parkinson's disease and Creutzfeldts-Jacob disease are patterns of degenerative neurocognitive impairment. Age is the single strongest risk factor for neurocognitive impairment. Other major risk factors include, female gender, cardiovascular disease, and illiteracy.[3] Individuals with mild cognitive impairment have significant, clinically identifiable and measurable cognitive deficit and memory loss, that does not disrupt successful daily activities, functioning and independent living.[4] It can be extremely difficult to make a distinction between mild cognitive impairment and neurocognitive impairment as an estimated third of individuals with the former progress to the latter.[4] The prevalence of age-related health problems is becoming an important public health concern as proportions of older individuals in populations worldwide grow.[4] There is a population growth due to the decline in deaths attributable to communicable diseases.[5] There is an evident demographic and epidemiologic transition trend over Africa and the impact of population aging in sub-Saharan Africa will increasingly augment the burden of degenerative diseases in the region. For these reasons, age-related diseases like neurocognitive impairment are fast becoming a new healthcare priority for Africa including Nigeria.

Neurocognitive impairment is one of the major causes of disability in older people.[4]Rural living, common in Africa is a documented risk factor for neurocognitive impairment especially Alzheimer's disease.[6] From projections, it is estimated that by 2050 the number of individuals older than 60 years will be approximately 2 billion and will account for 22% of the world's population.[4]Worldwide, the prevalence of neurocognitive impairment among those aged 60 years and above ranges from 5-7%. The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-V), represents the current 'gold standard' for dementia diagnosis worldwide[5] and puts the overall age adjusted prevalence of dementia in Ibadan, Nigeria at 2.29%.[7]

Neuroimaging plays an essential role in the management of neurocognitive impairment. Cranial magnetic resonance imaging (MRI), cranial computed tomography (CT), positron emission tomography (PET) and single photon emission computerized tomography (SPECT) are neuroimaging modalities relevant to the management of neurocognitive impairment. Neuroimaging studies can rule out primary and metastatic neoplasms, locate areas of infarction,

detect subdural hematomas, and suggest normal pressure hydrocephalus (NPH) or diffuse white matter disease and help to establish a regional pattern of atrophy. Support for the diagnosis of Alzheimer's disease (AD) include hippocampal atrophy in addition to posterior-predominant cortical atrophy. Focal frontal or anterior temporal atrophy suggests frontotemporal dementia (FTD).

MRI is the modality of choice because of the non-requirement of ionizing radiation and its superior soft tissue contrast and details.[8,9] MRI differentiates between neurocognitive impairment associated with metabolic diseases from inflammatory diseases and may also show abnormalities amenable to surgical treatment in a significant percentage of patients with neurocognitive impairment. MRI is able to identify focal lesions. Cost and the presence of metallic implants or medical devices common in the elderly limit the use of MRI.[8] CT is useful when there are contraindications to the use of MRI.[10] Several neuroimaging biomarkers can be employed in the diagnosis and clinical management of dementia.[11,12]

Neurocognitive impairment is one of the major causes of disability and mortality in the elderly.[4,13] It is the fourth major cause of death in the adult populace after heart diseases, cancer and stroke.[8] It has huge health, economic and social implications[4,8] as well as profound psychological and cultural ramifications.[7] The survival time for people living with neurocognitive impairment is about 6-9 years.[14]

A lot of resources are needed in the care of neurocognitive impairment patients.[15] Burden of care in terms of physical work, psychological distress and financial obligations is great.[16] There is no policy for the care of the elderly in Nigeria. Healthcare cover for the elderly in Nigeria is grossly inadequate.[14] There is also a cultural perception that many symptoms of neurocognitive impairment are simply features of old age, so the elderly is relegated to the background. There is no definitive cure for progressive dementia disorders presently but studies have shown that if dementia is detected and diagnosed early it can be better managed.[5]

Early diagnosis of neurocognitive impairment is dependent on using appropriate biomarkers. These biomarkers include neuroimaging biomarkers, chemical biomarkers, histologic biomarkers, and genetic biomarkers. There are many neuroimaging biomarkers of cognitive impairment. However, the visual rating scales evaluated on magnetic resonance imaging have been chosen for this study because they offer a cost-effective diagnostic tool that is ideally suited for implementation in clinical practice. They include Koedam scale, medial temporal lobe atrophy (MTA), global cortical atrophy (GCA) and Fazekas scale. Using these visual rating scales, attention will be focused on brain regions susceptible to change in neurocognitive impairment and there will be structured reporting of these findings. Visual rating scales can improve the sensitivity, reliability and diagnostic value of radiological image interpretation. It is also relatively easy to perform. However, some intra and inter-observer variabilities may occur.[17]

Numerous neuroimaging biomarkers exist and have been studied in details. However, a review of the literature shows paucity of local data in Africa and in particular, Nigeria[3] with respect to these neuroimaging biomarkers. This study will focus on progressive (degenerative) neurocognitive impairment and aims to determine the accuracy of visual assessment scales of cerebral atrophy as independent neuroimaging biomarkers of cognitive impairment and their correlation with age, educational status and severity of cognitive impairment in patients greater than 60 years of age.

Materials and methodology

Study site

The study was conducted at the Magnetic Resonance Imaging suite, Department of Radiology, University College Hospital, Ibadan.

Duration of study

The study spanned 10 months (September 1, 2016 – June 20, 2017).

Study design

A descriptive study among patients above 60 years with clinical diagnosis of neurocognitive impairment, being managed at the University College Hospital, Ibadan, who met the inclusion criteria. Objective assessment of the neuro-cognitive status of the patient was done by the

neurologist using the MMSE while results were blinded to the radiologist before neuroimaging visual analysis. The data collected was recorded in demography, clinical data and mini-mental state examination sheets. The patients had cranial MRI performed using 0.36 T MR (MagSense 360, Mindray). All subjects were scanned according to a standard dementia MRI protocol: Axial, coronal and sagittal T1-weighted, T2-wieghted and FLAIR spin-echo sequences. Radiological evaluation of the patients was performed using the visual assessment scores (Koedam, MTA, GCA, Fazekas) of the brain images acquired. The radiologic findings were documented on the radiology data sheet.

Inclusion Criteria

1. Patients 60 years of age or older (male and female).
2. Patients who have clinical diagnoses of neurocognitive impairment.

Exclusion Criteria

1. Retroviral positive patients.
2. Patients with moderate-severe head trauma (GCS < 13).

Sampling strategy (patient selection)

Serial recruitment (convenience) sampling method was employed. Elderly patients above 60 years with neurocognitive impairment, being managed at the University College Hospital, Ibadan were recruited into the study. Cranial MRI is part of the routine management of patients with neurocognitive impairment, making it relatively easy to recruit these patients. The details of the study and the procedure were thoroughly explained to the participants and their care givers in at least one simple comprehensible language (English and Yoruba) which the patient or care giver understands after which informed consent was obtained. The patients who did not give consent or meet the inclusion criteria were excluded from the study.

Sample size

The sample size after adjusting for attrition was 50.

Clinical evaluation

Baseline demographic data as well as relevant clinical information were obtained using a structured data proforma. The diagnosis of neurocognitive impairment was made according to the DSM –V criteria.. The diagnosis of mild cognitive impairment (MCI) is a clinical judgment and is based on the following criteria:

1) memory complaint documented by the patient and collateral source;
2) normal general cognition as determined by measures of general intellectual function and mental status screening instruments;
3) normal activities of daily living;
4) not demented (DSM-V);
5) memory impairment;
6) clinical Dementia Rating score of 0.5.

The mini mental state examination (MMSE) (Appendix 2) was used to classify the patient's findings as mild, moderate or severe neurocognitive impairment.[19]

However, specific diagnosis of neurocognitive impairment subtype may not be attained until after some patient's demise (at autopsy).

The Mini Mental State Examination (MMSE)

The MMSE is the best known, most widely used and the most important measure of cognition in clinical practice worldwide.[20] It is commonly used in medicine to screen for neurocognitive impairment as well as to systematically, repeatedly, routinely and thoroughly assess mental status in patients with neurocognitive impairment. It also estimates the severity and progression of neurocognitive impairment and used to follow the course of cognitive changes in an individual over time. Therefore, it is an effective tool for documenting an individual's response to treatment and other intervention. It examines functions including , attention and calculation, recall, language, ability to follow simple and complex commands and orientation. The MMSE is effective as a screening instrument to categorize patients with cognitive deficits into those with mild, moderate or severe neurocognitive impairment:

1) ≥24 points is Normal cognition.
2) 19-23 points is Mild cognitive impairment
3) 10-18 points is Moderate cognitive impairment
4) ≤9 points is Severe cognitive impairment

Anthropometry

The weight (kilogram), height (meters), body mass index (kg/m^2), waist circumference (centimeters) and hip circumference (centimeters), waist hip ratio

were obtained for each subject. The weight was measured in kilograms using a beam balance scale with subjects wearing light clothing and no shoes. Height was measured with a stadiometer to the nearest centimeter without the subject wearing shoes, caps or headgear and standing with the straightened back to the measuring rod and looking straight ahead. Body Mass Index was calculated using the formula: weight/height^2 (kg/m^2) with normal defined as 18-24.9kg/m^2, overweight as 25-29.9kg/m^2, and obesity defined as a body mass index (BMI) $\geq$30kg/m^2.

The waist circumference was measured with a flexible inelastic measure tape calibrated at 0.1cm intervals and measurements taken directly over the skin. The measurement was taken midway between the xiphisternum and pubic symphysis and the circumference measured in a horizontal plane at the end of normal expiration. The hip circumference was also taken around the maximum circumference of the buttocks with subjects standing with their feet together. The Waist to Hip ratio was calculated and recorded (> 0.85 for females and >0.9 for males was taken as indicative of truncal obesity).

Radiological evaluation

Magnetic Resonance Imaging (MRI) Technique

The participants had cranial MRI done without prior knowledge of the MMSE results and the degree of cognitive impairment of the participants. The participants changed into examination clothes and an intravenous access line was secured. They were positioned supine on the MRI couch and a radio frequency coil applied to the cranium. MR

Imaging was performed using 0.36 T MR (Mag Sense 360, Mindray) according to a standard dementia MRI protocol.[2] Post contrast T1-Weighted images were also acquired. Images generated were automatically stored on MRI scanner memory and on the local server and intranet facility- Picture Archiving and Computer System (PACS). Furthermore, copies of images were saved on hardware compact discs to serve as additional backup.

The MMSE data as well as the visual assessment scores- Koedam, medial temporal lobe atrophy, global cortical atrophy and Fazekas scores, with the details of strategic infarcts, extracted from each patient's images were appropriately documented in prepared standard study data sheets and analyzed.

Data management and statistical analysis

The data generated was entered and analyzed using the Statistical Package for the Social Sciences (SPSS) software version 20 (SPSS Inc. Chicago, IL, USA.) spread sheet. All data are presented as texts, frequency tables, proportions and percentages, charts and figures. Categorical variables are presented as proportions and percentages while medians and means ± standard deviation were used to present the results of continuous variables (age and anthropometric measurements of the participants).

The independent student's t-test was used to test association between continuous variables at 5% level of significance. Chi square test at 5% level of significance was used to test association of strategic infarcts with severity of cognitive impairment. The presence of strategic infarcts was grouped into right, left or both parieto-temporal and temporo-occipital association areas.

Visual rating scores were analyzed using their median values since these are ordinal data. For statistical analysis, the averaged atrophy scores of the right and left hemisphere for each participant's Koedam scores and MTA scores, as well as the GCA and Fazekas scores were used. The visual rating scores were categorized into high and low scores based on the median score of each visual rating scale. All values below the median score were categorized as low scores while the median score and higher than median scores were categorized as high scores.

The Spearman's Rho test was used to determine the association between the 4 visual rating scales as independent neuroimaging biomarkers of cognitive impairment. The Kruskal-Wallis and Mann-Whitney Wilcoxon tests were used to determine the association of cerebral atrophy and small vessel disease with severity of cognitive impairment. The chi square test (Pearson's chi-square test and Fisher's exact test) was used to determine the association of gender, educational level and vocation with cerebral atrophy. The odds ratio and logistic regression analysis were used to test for association and significance of confounders. Statistical significance level was

defined as $p < 0.05$.

Results

A total of 50 participants were recruited into the study. Tables 1 gives a summary of the socio-demographic and clinical data of the participants. The mean age of the patients was 73.4 ±7.14 years with a minimum age of 62 years and a maximum of 90 years. The participants comprised 27 (54%) males and 23 (46%) females with a male to female ratio of 1.17:1. Married participants constituted about thirty-two (64%) of the study population. Twenty-seven participants (54%) obtained tertiary education and 11(22%) had primary education. Thirteen (26%) of the participants had at least a vocation while 44 (88%) of the participants were of Yoruba ethnicity. Seven (14%) of the participants had previous mild cognitive impairment. Six (12%) participants had a positive family history of cognitive impairment. A significant history of smoking and alcohol intake was elicited in 7(14%) participants as shown in Table 1.

Table 1: Socio-demographic characteristics of the study population

Variables	Frequency	Percent
Sex		
Female	27	54.0
Male	23	46.0
Marital Status		
Married	32	64.0
Others	18	36.0
Educational Level		
Primary	11	22.0
Secondary	12	24.0
Tertiary	27	54.0
Vocation	13	26.0
Ethnicity		
Yoruba	44	88.0
Others	6	12.0
Lives alone	1	2.0
History of previous mild cognitive impairment	7	14.0
Presence of associated co-morbidity	38	76.0
Positive family history of cognitive impairment	6	12.0
Significant smoking/alcohol intake	7	14.0

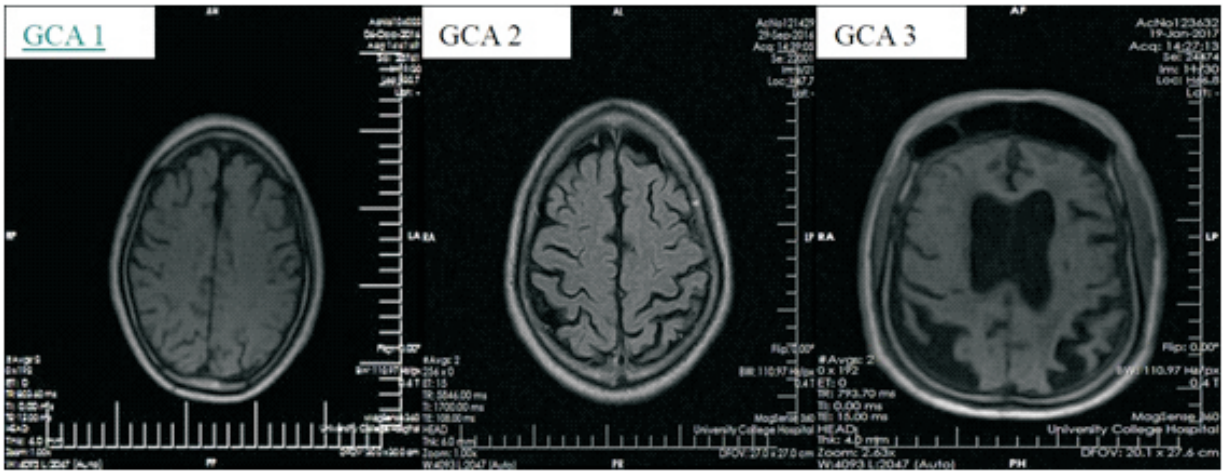
There was statistical significant difference between the mean height of male participants m ≥ 168.6 ± 7.97cm and the mean height of female participants m ≥ 155.3 ± 6.74cm ($p < 0.001$, 95% CI: 9.10; 17.58). Also, the mean weight of male participants m ≥ 68.63 ± 8.63kg was statistically significantly higher than the mean weight of female participants m ≥ 58.77 ± 5.78kg ($p < 0.001$, 95% CI: 5.60; 14.12). Likewise, there was statistical significant difference between the mean waist circumference of male participants m ≥ 87.93 ± 9.64 cm and the mean waist circumference of female participants m ≥ 80.96 ± 10.21cm ($p \geq 0.017$, 95% CI: 1.32; 12.62). Also, the mean hip circumference of male participants m ≥ 98.74 ± 7.40 cm was statistically significantly higher than the mean hip circumference of female participants m ≥ 92.35 ± 9.93 cm ($p \geq 0.015$, 95% CI: 1.31; 11.47). However, there was no statistical significant difference between the means of the age, BMI and waist-hip ratio of male and female participants.

Thirty-eight (76%) participants had at least one associated co-morbidity. The most frequent co-morbidities were hypertension in 33(66%) participants, DM in 17(34%) participants, CVD/TIA in 5(10%) participants, previous head trauma in 2(4%) participants and previous cranial surgery in 2(4%) participants.

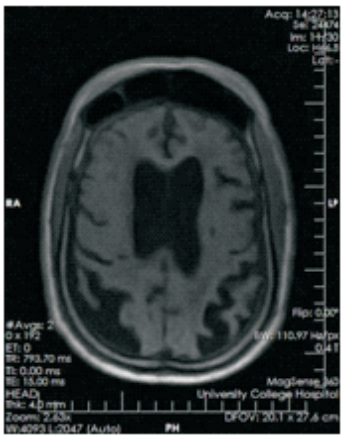
Averaged right and left scores were used for Koedam and MTA scores because these have paired (right and left) scores. The median average Koedam score of the participants was 1.5 with a maximum score 3 and a minimum score of 0. Also, the median average MTA score of the participants was 2 with a minimum average score of 0.5 and a maximum average score of 4. The median GCA score of the participants was 2 with a minimum score of 0 and a maximum score of 3. The median Fazekas score of the participants was 2 with a minimum score of 1 and a maximum score of 3.

MRI images in figure 2 shows GCA 1-3 scores.

a



b

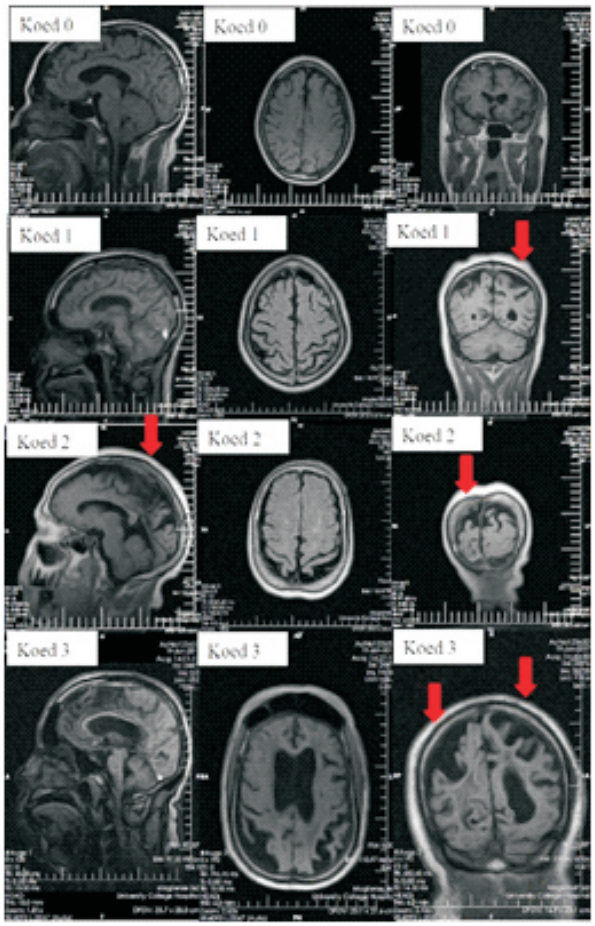


Axial T1W

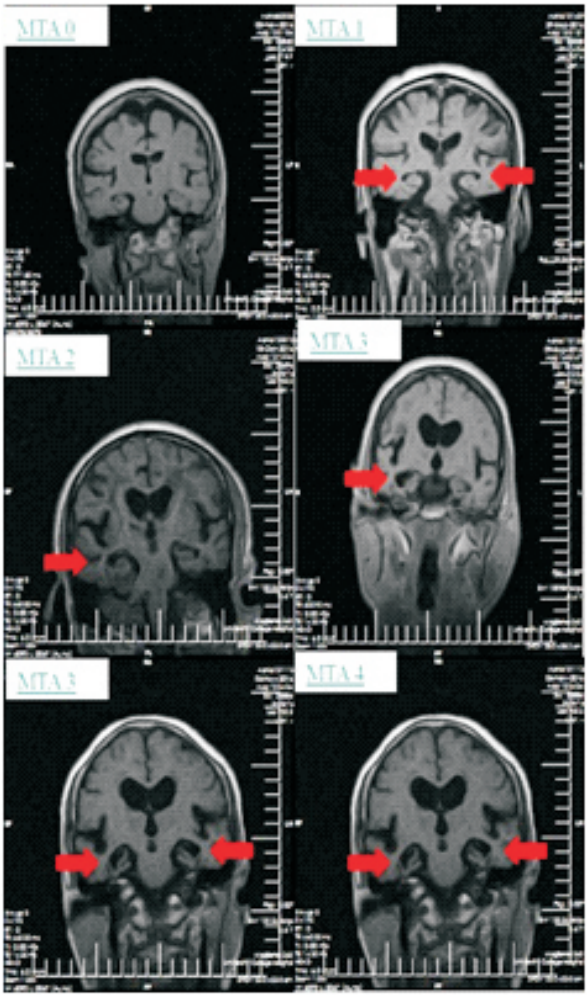
Figure 2a: Axial T1W MR Images showing GCA scores 1-3.
Figure 2b: Axial T1W MR image showing right parieto-occipital association infarct.

Samples of the images obtained and their respective Koedam, MTA and Fazekas scoresas depicted in Figures 3a-3c.

a



b



c

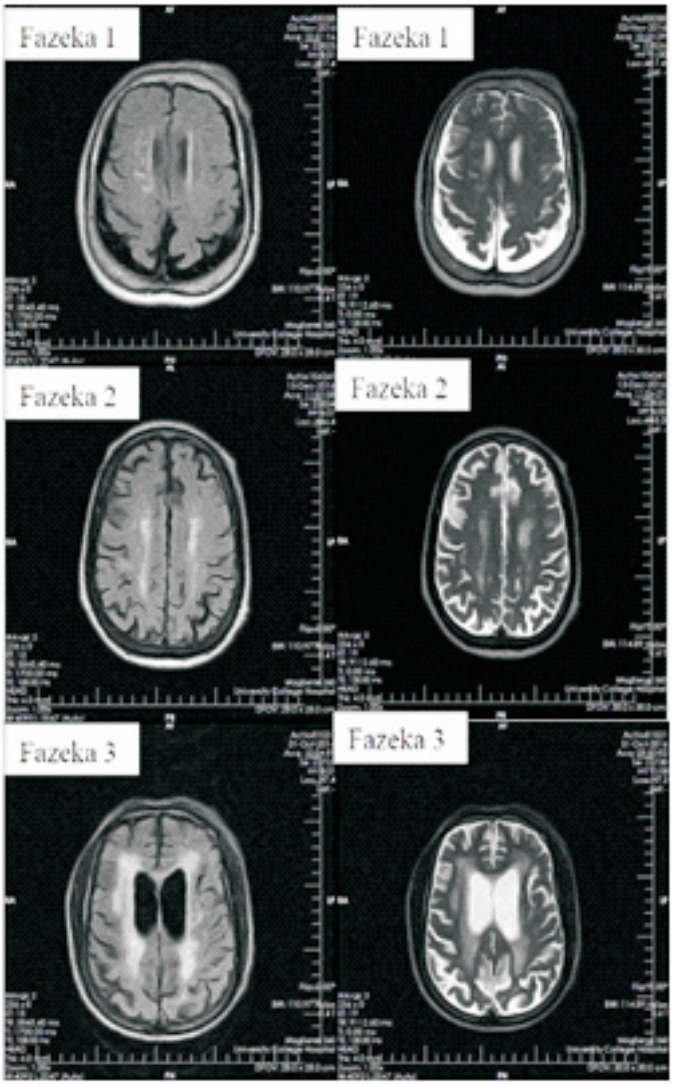


Figure 3a: Sagittal, axial and coronal MR T1W images respectively showing posterior cerebral atrophy. The arrows show atrophy of the posterior brain regions.

Figure 3b: Coronal T1W MR Images showing MTA scores 0-4. The arrows show medial temporal lobe atrophy.
Figure 3c: Axial FLAIR MR Images showing Fazekas scores 1-3.

Strategic infarcts were detected in 22(44%) participants with about 77.3% (17/22) located either on the left, right or both sides of the parieto-temporal association areas as shown in Table 2.

Table 2: Distribution of Strategic Infarcts

	Frequency	percent
Strategic Infarcts		
Present	22	44.0
Absent	28	56.0
Location of Strategic Infarcts (22)		
Left PT association area	8	36.4
Right PT association area	1	4.5
Bilateral PT association area	8	36.4
Left TO association area	2	9.1
Right TO association area	2	9.1
Bilateral TO association area	6	27.3

‡‡PT≥ parieto-temporal ††TO≥ temporo-occipital

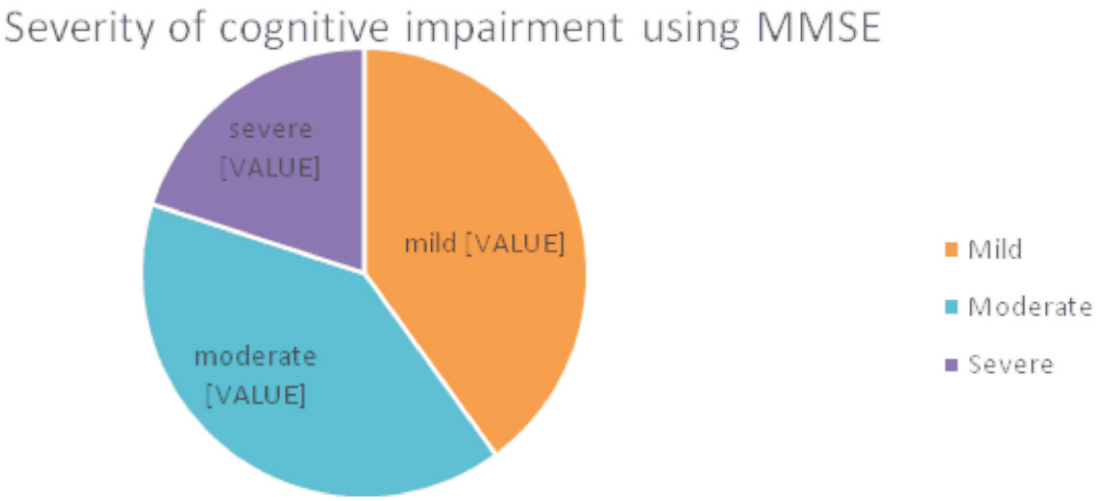


Figure 4: Distribution of MMSE Score in the study population

There was no statistical significant association between age and MMSE score, and sex and MMSE score of participants.

The Spearman's Rho test was used to test for association between the various visual rating scales as independent neuroimaging biomarkers of cognitive impairment. There was a moderate negative correlation between Fazekas score and MMSE score of participants with cognitive impairment ($r \geq -0.348$, $p < 0.05$). There was a strong positive correlation between average koedam score and GCA score of participants ($r \geq 0.854$, $p < 0.01$). Also, there was a moderate positive correlation between average MTA score and Fazekas score of participants ($r \geq 0.338$, $p < 0.05$) as shown in Table 3.

Table 3: Correlation between various visual assessment scales as independent neuroimaging biomarkers of cognitive impairment

(*≥ p< 0.05, ** ≥ p<0.01, Koedave ≥ average Koedam score, MTA ave ≥ average MTA score)

		MMSE Score	GCA Score	Fazekas Score	Koedam score	*MTA score*
Spearman's Rho	MMSE Score	1.000				
	Global Cortical Atrophy Score	-0.119	1.000			
	Fazekas Score	-0.348*	0.182	1.000		
	Koedave	-0.188	0.854**	0.255	1.000	
	MTA ave	-0.225	0.044	0.338*	0.209	1.000

The association between the visual assessment scores and severity of cognitive impairment was tested with Kruskal-Wallis H test. It showed that there was no significant association between cerebral atrophy and severity of cognitive impairment.
However, there was significant association in the Fazekas scoreamong the different levels of severity in patients with cognitive impairment ($X^2 \geq 7.489, p \geq 0.024$) as shown in Table 4.

Table 4: Association between different visual rating scores and severity of cognitive impairment

	N	Mean rank	X^2	df	P value
GCA score					
Mild	20	22.55			
Moderate	20	28.15	1.793	2	0.408
Severe	10	26.10			
Koedam score					
Mild	20	21.85			
Moderate	20	27.53	2.262	2	0.323
Severe	10	28.75			
MTA score					
Mild	20	20.33			
Moderate	20	27.58	4.931	2	0.085
Severe	10	26.30			
Fazekas score					
Mild	20	19.35			
Moderate	20	29.60	7.489	2	0.024*
Severe	10	29.60			

‖ *Significant

Participants with low MTA score had statistically significantly higher MMSE scores than participants with high MTA score ($U \geq 194.0, P \geq 0.034$) as shown in Table 5.

Table 5: Association between low and high MRI visual rating score and severity of cognitive impairment

	MMSE Score					
		Mean rank	U	W	Z	p-value
GCA score low	20	26.3				
high	30	25.0	285.0	750.0	-0.300	0.764
Koedam Ave low	20	26.8				
high	30	24.6	274.0	739.0	-0.520	0.603
MTA Ave low	20	30.80				
high	30	21.97	194.0	659.0	-2.122	0.034**
Fazekas score low	3	38.33				
high	47	24.68	32.000	1160.0	-1.590	0.125*

§* *Fisher's exact* **significant.

Association of socio-demographic and clinical data with cerebral atrophy was tested using the chi square test. Although male participants had higher Koedam scores than female participants, the difference was not significant. Same non-significant difference was observed for marital status, educational level, vocation, ethnicity, positive family history of cognitive impairment.

The independent student's t-test showed no statistical significant association between age, BMI and waist-hip ratio, and average Koedam score of participants. There was a statistical significant association between educational level of participants and participants average MTA scores ($X^2 \geq 6.294$ $p \geq 0.017$). About 69.2% of participants with secondary and below educational level had high average MTA scores while about 27.3% of participants with tertiary education had high average MTA scores.

There was no statistical significant association between age, BMI, waist-hip ratio and the average MTA score of participants.

Multivariate analysis tested for an association between socio-demographic, clinical data and average MTA scores of participants, after adjusting for confounders. Level of education had statistically significant association with average MTA scores of participants. Participants with secondary and below level of education were about 15 times more likely to have high average MTA score than participants who had tertiary education (AOR $\geq$ 14.6, 95% CI: 1.19; 179.4, P $\geq$ 0.036) as shown in Table 6.

Table 6: Multivariate analysis of factors associated with participants' average MTA scores

	Adjusted OR	95% confidence interval		p-value
Variables		Lower	upper	
Sex				
Male	1			
Female	0.83	0.19	3.55	0.800
Educational level				
Tertiary	1			
Secondary and below	14.6	1.19	179.4	0.036*
Vocation				
No	1			
Yes	0.49	0.10	2.55	0.387
History of previous mild cognitive impairment				
No	1			
Yes	0.63	0.003	1.41	0.081
Significant smoking/alcohol intake				
No	1			
Yes	6.76	0.31	146.9	0.224

‡*significant

Discussion

Cerebral atrophy can be used as a neuroimaging biomarker in elderly patients with neurocognitive impairment.[20] Several studies have been conducted to determine the association between cerebral atrophy and cognitive impairment. However, these studies show contradictory findings with significant association between cerebral atrophy and cognitive impairment in some and not in others,[24] Cerebral atrophy is one of many factors that affect the cognitive status of individuals.[21,23,36] All the studies agreed that there is significant association of cerebral atrophy with cognitive impairment and increasing age.[24,25,26]

In this study, cerebral atrophy was measured using[3] visual rating scales- Koedam, MTA and GCA while small vessel disease was assessed using the Fazekas scale (white matter hyperintensities) and presence of strategic infarcts. An attempt was made to correlate cerebral atrophy with the cognition status of the participants and the study showed a significant association between MTA scores and severity of cognitive impairment but a non-significant association of Koedam score and GCA score with severity of cognitive impairment. This finding is similar to the findings by Pantano et al. and Shibamoto et al. who also reported no significant association between cerebral atrophy and cognitive impairment.[25,27]

There was statistically significant association between medial temporal lobe atrophy and severity of cognitive impairment and this agrees with the findings of Nihon et al. They reported a statistically significant association of hippocampal atrophy

with cognitive impairment using the participant's MTA scores.[26]

Fjell et al. reported a significant correlation between cerebral atrophy and neurocognitive impairment. In their study, an automated method was used to assess cerebral atrophy.[24]Bilello et al. described a significant association between cerebral atrophy and cognitive impairment.[28] In their study, only Alzheimer's disease patients were recruited and the CERAD (Consortium to Establish a Registry for Alzheimer's Disease) neuropsychiatric battery instrument was employed for the study, not the MMSE assessment tool. This may explain the significant association between cerebral atrophy and cognitive impairment in their (Bilello et al.) study.[28]

Harper et al. also reported a statistically significant correlation between visual rating scales (MTA and GCA) and cognitive impairment.[30] This was a longitudinal study with pathologic (autopsy) correlation. A 1.5T MRI machine was used for the study.

Most studies that reported a significant correlation between cerebral atrophy and cognitive impairment used at least a 1.5T machine and larger sample size of at least 101 participants.[24,26,28]

There was a significant association between Fazekas score and severity of cognitive impairment of participants. This is in agreement with the findings of Nihon et al. who reported similar association between Fazekas score and severity of cognitive impairment of participants.[54] This suggests that Fazekas score is useful and relevant in measuring cognitive impairment of patients in this environment. As a measure of small vessel disease, it correlates significantly with the severity of cognitive impairment.

There was no significant association between strategic infarcts and severity of cognitive impairment. This may be attributable to the tesla strength of the MRI machine used. Most of the infarcts were noted in the left parieto-temporal association area. This is in agreement with the findings of Akinyemi et al. who noted the region as the most commonly affected by brain infarcts.[29] This implies strategic infarcts does not directly correlate to worsening cognitive impairment in this environment.

There was a strong positive correlation of Koedam score with GCA score. There was also a strong positive correlation of average MTA score with Fazekas score. This is in agreement with Pantoni et al. who reported a strong positive correlation among the visual rating scales, especially between koedam and GCA and between MTA and Fazekas.[30] It also agrees with Vasconcellos et al. who reported positive correlation among MTA and Fazekas scores.31 There were other positive associations among the visual rating scales but these were not significant. This may be attributable to the tesla strength of the MRI machine used and the study sample size.

There was no significant association between age and the visual rating scores, and severity of cognitive impairment (MMSE scores of participants). However, hypothetically if there were more participants older than eighty years of age, the result might have been significant. This agrees with GeYulin et al.[32] who reported an association of age with MMSE scores of participants.

Apart from age, other factors such as gender, educational qualification, vocation, positive family history of cognitive impairment, significant smoking, and alcohol intake may influence cognitive impairment.[7]

There was no significant association of gender with cerebral atrophy in this study with respect to the Koedam and MTA scores of participants. Although males had a higher Koedam and MTA scores, these were not statistically significant. This is in agreement with Ge Yulin et al.[32] and Allen etal.[33] They reported no sex prevalence with respect to cerebral atrophy. Bilello et al.[28] also reported no correlation of age and sex of study participants with cerebral atrophy. However, this is at variance with Bromiley et al.[34] who documented that cerebral atrophy is significantly higher and developing faster in men than women. This may be attributable to the fact that Bromiley's study was a longitudinal study in contrast to this cross-sectional descriptive study.

Participants with low MTA scores had statistically significant higher MMSE scores than participants with high MTA scores. This implies that the MTA score is very relevant as a neuroimaging biomarker in this environment. The significant association between participants' average MTA scores and educational level of participants would suggest that individuals with tertiary education were about [15] times more likely to have a low MTA score. This is in agreement with the findings of Ogunniyi et al.[7]

who reported low educational attainment as a significant risk factor for neurocognitive impairment. There was no significant association between MTA scores of participants and vocational involvement. However, a trend was noted. The relatively lower educational level and poor vocational inclination of the participants in this study also explains the significant association of MTA scores with severity of cognitive impairment as higher educational level and being involved in a vocation confers protection against neurocognitive impairment because of continuous brain stimulation.[7]

Conclusion

The significant association between medial temporal lobe atrophy and severity of cognitive impairment suggests medial temporal lobe atrophy is a useful marker of the severity of cognitive impairment. White matter disease is significantly associated with presence and severity of cognitive impairment. This underscores the effect of small vessel disease in neurocognitive impairment. Both medial temporal lobe atrophy and white matter disease can serve as useful neuroimaging biomarkers of neurocognitive impairment.

Recommendation

1) Routine MTA score and Fazekas score, among other visual rating scores, should be included in the neuroimaging work up of patients with neurocognitive impairment.

2) A higher tesla machine (at least 1.5T) will delineate cerebral atrophy and white matter changes better. This is recommended for future studies.

3) There should be research into other neuroimaging biomarkers using structural, functional and metabolic neuroimaging biomarkers.

4) A long term prospective, preferably multicenter study with larger sample size and serial imaging of patients will better test the association between cerebral atrophy and cognitive impairment.

Study limitations

1) The number of patients in the study is relatively smaller, compared with other similar studies, which might have reduced the power of the study to detect associations of cerebral atrophy and small vessel diseases with some of the variables. This is largely due to lack of funds to undertake cranial MRI evaluation and poor attitude of the public to care of the elderly.

2) Some essential data were either not volunteered by the patients because of their cognitive status or were not known to the care givers.

3) A 0.36 tesla MRI machine was used for this study. This might have limited the resolution of details of some cerebral atrophy and small vessel diseases.

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CASE REPORT OF A SICKLE CELL DISEASE PATIENT WITH PRIAPISM TRIGGERED BY ANTI-CONVULSANT THERAPY IN JUTH

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ABSTRACT

Background: Priapism is defined as an abnormal persistent erection of the penis. It is usually painful and it is unrelated to sexual stimulation or unrelieved by ejaculation. Priapism results from a variety of possible etiological factors, including a number of pharmacological agents like antiepileptic medications.

Case summary: A 30-year-old man, a known sickle cell disease patient with background post cerebrovascular accident (CVA) seizure disorder, developed multiple episodes of priapism after commencement of a particular antiepileptic medication. The onset of priapism was noticed to coincide with the commencement of levetiracetam, an antiepileptic drug, and persisted while patient was on the medication.

He had several conservative and surgical interventions for the twelve episodes of priapism he had over the two-year period following commencement of levetiracetam. These included corporal aspiration, Winter's, T, Ebbehoj distal shunts with the last intervention being Al-Ghorab shunt. The withdrawal of the anticonvulsant, levetiracetam, however coincided with the cessation of priapism. He was subsequently commenced on Tab Epilin Chromo 200 mg bd, Meditriol 0.25 mgdly, and Neurovite forte 1dly. He also became seizure free subsequently.

Conclusion: A possible causative factor of priapism in this patient, namely levetiracetam, could have been masked by the background hemoglobinopathy but for a high index of suspicion. The withdrawal of this anti convulsantcoincided with the resolution of priapism in this patient.

INTRODUCTION

Priapism describes a persistent penile erection arising from dysfunction of the mechanisms regulating penile tumescence, rigidity and flaccidity. It is defined as a full or partial erection that continues more than 4 hours beyond sexual satisfaction and orgasm **or** is unrelated to sexual stimulation.[1]

Possible etiological factors responsible for priapism include thromboembolic (sickle cell disease, leukemia, thalassemia, thrombocytopenia), neurogenic (spinal cord injuries, disc prolapse, cauda equina compression),medications (anticonvulsants, anticoagulants, antidepressants, antihypertensives, antipsychotics), malignancies, traumatic, and iatrogenic causes.[2]

Among anticonvulsants, the following medications have the potential for causing priapism: valpromide, brivaracetam, valproic acid, topiramate, oxcarbazepine, clonazepam, carbamazepine and levetiracetam. Of these, valpromide has the largest association.[3]Bansal et al[4] reported a case of priapism associated with valproic acid. Perkoz et al[5] also reported a similar case in association with levetiracetam.

Rarely, there could be more than one possible risk factor in a patient with priapism. It is therefore necessary that all clinical armamentarium and acumen are brought to bear to ensure accurate identification of the offending risk factor.

Although, only a possible causality was established between levetiracetam and priapism, it is important that awareness is created by this report to help physicians in prescribing this drug safely in the future.

CASE SUMMARY

Mr. A.I is a 30-year-old who was diagnosed as a sickle cell disease patient in infancy and was regular on hematology outpatient clinic visits. His initial presentation to Urology Division of the above facility on account of priapism was three years ago with the first of many episodes of stuttering priapism. He went on to have eleven other episodes all managed accordingly.He has been free of the condition over four months from the time of review.

Prior to the initial presentation, he had multiple (five) episodes of right hemispheric ischemic cerebrovascular accident (CVA) spanning a period of twenty-one years with a sequela of psychomotor retardation. The first ever episode occurred when he was five years of age. He presented with the repeat episode to Jos University Teaching Hospital (JUTH) which was characterised by altered sensorium, slurred speech, impaired motor function and a ten minutes history of loss of consciousness. He is not a known hypertensive.

He subsequently developed multiple episodes (four) of seizure disorder. Seizures were generalized and tonic-clonic in nature with no preceding aura, no post-ictal sleep nor loss of sphincteric function. Each seizure episode lasted about 3-5 minutes. An electro-encephalogram done revealed multiple diffuse epilepti form activities. He was initially placed on Tab Carbamazepine 200mg twice daily which was changed to Tab levetiracetam 500mg daily when seizures became recurrent.

His first episode of low-flow priapism coincided with the commencement of levetiracetam in treatment of the seizure disorder. This occurred 27 years after being diagnosed as a sickle cell disease

patient and seven weeks after the first episode of seizure which was initially treated with Carbamazepine. The episode resolved on non-operative treatment. Patient was discharged on oral analgesics, non-iron blood building supplements and advice on liberal oral fluid intake. He went on to have multiple (twelve) episodes of priapism spanning a period of two years.

INTERVENTION

The multiple episodes of priapism had warranted several conservative and surgical interventions including corporal aspiration, Winter's, T, Ebbehoj distal shunts, the last intervention being Al-Ghorab shunt with use of Hegar's dilator over the two-year period.

The recurrent nature of seizures which occurred inter currently with episodes of priapism warranted the review of his anticonvulsant regimen. Oral levetiracetam was discontinued and patient was placed on Tab Epilin Chromo 200 mg bd, Meditriol 0.25 mgdly, and Neurovite forte 1 dly.

Episodes of priapism tailed off following withdrawal of Tab levetiracetam. Patient had no repeat episode of priapism after levetiracetam was discontinued and he also became seizure free following review of anticonvulsant therapy. Better seizure control with Sodium valproate might have also had a role in resolution of priapism as the initial poor seizure control could have contributed to the prior recurrence of the priapism.

DISCUSSION

Priapism, a common urological emergency, usually arises from a variety of possible causes. Some etiological factors like hemoglobinopathies are more frequently implicated than others. It is a known fact that sickle cell disease is the cause of priapism in 2% to 29% of males with the disease.[6]

Among the less commonly reported causes of priapism are medications like anticonvulsants. Pekoz et al[5] reported a similar association identified in literature between levetiracetam and priapism. This was found in a 15-year-old male in Cukurova University, Adana, Turkey. Similar to our index case, the priapism resolved after withdrawal of the anti-convulsant.

The present case scored four on Naranjo adverse drug reaction probability scale[7], corresponding with a "possible causality". Since only a possible causality has been established, a definitive inference on this case is not warranted.

CONCLUSION

Even though the onset and cessation of episodes of priapism coincided with commencement and withdrawal of the anticonvulsant treatment for seizure disorder respectively,levetiracetam established only a possible causal association with priapism.

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DETERMINATION OF THE PREDICTIVE VALUE OF IPSS ON THE OUTCOME OF TRIAL OF VOIDING WITHOUT CATHETER IN BPH PATIENTS PRESENTING WITH ACUTE URINARY RETENTION

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ABSTRACT

Background: Acute urinary retention is a common urological emergency. This study was to determine the value of storage IPSS, voiding IPSS and total IPSS in predicting the outcome of trial of voiding without catheter in patients with BPH presenting with acute urinary retention.

Methods: This was a prospective observational study that included patients seen at the Accident and Emergency Unit of Jos University Teaching Hospital with acute urinary retention from benign prostatic hyperplasia. Each patient had clinical evaluation, and urethral catheter was passed to relieve the retention, then an International Prostate Symptom Score questionnaire was patient self- administered. The patients were all placed on Tamsulosin 0.4mg daily for 3 days after which they had trial of voiding without catheter (TWOC). Statistical analysis was done using SPSS$^{(R)}$version 23 and MedCalc Statistical software version 17.2.

Results: Seventy-six patients with age range 52-82years were enrolled in the study. The means of IPSS storage, IPSS voiding and IPSS total were9.00, 10.64 and 19.55 respectively. IPSS storage (AUC$\geq$ 0.768, p$<$ 0.0001), IPSS voiding (AUC$\geq$0.760, p$<$ 0.0001), and IPSS total (AUC$\geq$ 0.793, p$<$0.0001) predicted the outcome of trial without catheter (TWOC) with cut-off marks of 9, 10, and 20 respectively.

Conclusion: IPSS storage, IPSS voiding, and IPSS total significantly predicted the outcome of trial without catheter in patients with BPH presenting with acute urinary retention.

KEY WORDS: IPSS, urinary retention, BPH, Tamsulosin, Trial of voiding without catheter.

Background

Acute urinary retention (AUR) is a severe complication of benign prostatic hyperplasia (BPH) characterized by a sudden and painful inability to void voluntarily.[1] It is one of the most common emergencies presenting to a urology unit.[2] It is a common event in the natural history of BPH and may be the first manifestation of bladder outflow obstruction in up to 25% of cases.[3]Although, BPH is not a life-threatening condition, some men with lower urinary tract symptoms (LUTS) have a progressive disease which is defined as a deterioration of symptoms, deterioration of health-related quality of life, decreased peak flow rate, increased prostate size or unfavorable outcomes such as AUR and BPH related surgery.[4] AUR is often considered to be the most serious complication of BPH and it is distressing for the patient and also has considerable economic costs.[5,6] AUR is an indication for prostatectomy and accounts for 25-30% of emergency transurethral resection of the prostate (TURP)[7]. In addition, analysis of 176,046 men admitted to NHS hospital in England for AUR between 1998 and 2005 has shown that mortality within the year after a first AUR episode was much higher than in the general population, especially in younger patients.[8] Data from large community-based longitudinal studies have identified old age, severe LUTS, low peak flow rate, high post void residual urine (PVR), enlarged prostate, and high serum PSA as significant risk factors for spontaneous AUR[9]. In some cases, AUR follows a triggering event also called precipitated AUR (pAUR) such as a surgical procedure with general or loco-regional anaesthesia, excessive fluid intake, urinary tract infection (UTI), or intake of medications with sympathomimetic or anticholinergic effects.[10]

The American Urological Associations' seven-symptom index was adopted by the World Health Organization (WHO) as the International Prostate Symptom Score (IPSS), after the addition of one disease-specific quality of life (QoL) question, as a means of assessing the global impact of LUTS on the quality of life. The IPSS has been shown to have excellent test-retest reliability and to be internally consistent. It is also sensitive to changes in symptomatology.[11,12]The IPSS is the most widely used score globally.[13] It is a well-designed and extensively studied scale for quantifying lower urinary tract symptoms suggestive of benign prostatic obstruction.[13,14]The IPSS consists of seven questions that deal with voiding symptoms (incomplete emptying, intermittency, weak stream, and straining to void) and storage symptoms (frequency, urgency, and nocturia). Measuring IPSS sub-scores and calculating the IPSS voiding-to-storage sub-score ratio (IPSS-V/S) is a simple and useful method for differentiating between failure to void lower urinary tract dysfunction (LUTD) and failure to store LUTD.[15,16]

Management of AUR consists of immediate bladder decompression by catheterization, which is usually followed by BPH-related surgery.[17,18] The functional symptoms of BPH can be reduced by α-blockers such as Doxazocin and Tamsulosin, which improve flow rates and bladder emptying, and it is thought that they help to reduce bladder outlet resistance by effects on the sympathetic tone of the bladder neck and prostatic stroma.[6] Surgical intervention in the presence of a urinary catheter can lead to an increased risk of sepsis, which potentially contributes to the observed increase in operative morbidity (especially in older patients). These findings led to the increasing use of trial without catheter (TWOC), which is a therapeutic method to induce self-voiding after a certain period of urethral catheterization and it is being attempted in many patients with AUR.[18]

This study was to find out the predictive value of IPSS storage, IPSS voiding and IPSS total on the outcome of TWOC in patients presenting with AUR from BPH. This is to provide a simple method of assessing outcome of TWOC in AUR from BPH, hence avoiding urgent surgery or allow elective surgical intervention without the presence of a prolonged urinary catheter.

Methods

This study was a hospital-based observational study from August, 2018 to July, 2019 at the authors' institution. Male patients with first episode of AUR from BPH who consented were recruited for this study via a non-probability (purposive) sampling technique, after obtaining ethical

approval from the ethical committee of the hospital. The exclusion criteria were; patients with AUR who had been receiving treatment for BPH, patients with UTI, gross haematuria or carcinoma of the prostate, and patients with failed urethral catheterization and those with urinary drainage of greater than 1000mls after relief of retention.[19]

Patients that presented to the Accident and Emergency with features suggestive of AUR were clinically evaluated. They were relieved of urinary retention by passing a size 16F latex Foley urethral catheter, and urine samples were taken for microscopy, culture, and sensitivity. The volume of urine drained was recorded using a calibrated container and the catheter spigotted. A copy of the IPSS questionnaire was patient self-administered. Blood samples were taken for urea, electrolyte, and creatinine, prostate specific antigen (PSA) test and fasting blood glucose (FBG). Trans-abdominal ultrasound evaluation of the prostate and urinary tract, including prostate volume was performed by the same consultant radiologist in the hospital after which the drainage bag was applied.

All patients who fulfilled the inclusion criteria were recruited for this study. Each subject was placed on Tamsulosin 0.4mg daily.

The patients were discharged home and were told to come for TWOC on the third day post urethral catheterization.

On presentation at the uroflow room, the drainage bag was removed and a spigot was applied to the drainage port of the urethral catheter, and patient was instructed to drink 750 ml of water. The urethral catheter was removed once the patient had the urge to urinate. TWOC was attempted under uroflowmetric study. Maximun flow rate (Qmax), average flow rate (Qave), and voided volume were recorded in a structured proforma for subsequent analysis. Patients with inability to pass urine or passage of < 150 ml of urine, andQmax< 10 ml/s were said to have an

unsuccessful TWOC.[20] A size 16F silicon Foley catheter was passed for all patients with unsuccessful TWOC.

All data obtained from the study subjects were collated and subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS®) version 23. Med Calc Statistical software version 17.2 was used for receiver operating curve (ROC) analysis. The receiver operating characteristic (ROC) curve was used to determine the predictive power of IPSS- storage, IPSS-voiding, and IPSS- total in the outcome of TWOC in patients with AUR attributable to BPH. A *p*-value of < 0.05 was considered as statistically significant.

Ethical approval and consent to participate

Permission to conduct this study was obtained from the Research and Ethics Committee of Jos University Teaching Hospital (JUTH) with committee reference number JUTH/DCS/ADM/127/XXV/193. Informed consent was also obtained from all patients who met the criteria for inclusion in the study and only consenting patients were enrolled for this study.

Results

A total of 80 men who met the inclusion criteria and gave consent were recruited for the study. The study period was from June 2018 to July 2019. However, 4 patients were excluded from the study because they did not turn up for TWOC, leaving 76 (95%) for analysis. The age range of the subjects was 52-82 years with a mean age of 65.13years.The educational level of the study participants is shown in Figure 1.

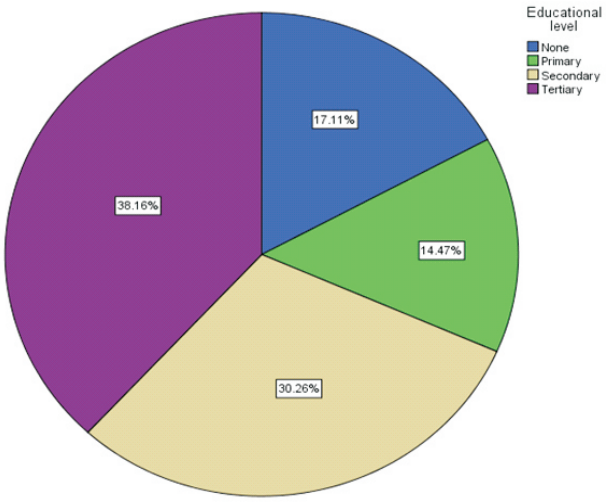

Figure 1

The descriptive statistics showed that the mean urine volume drained was 708.41 mls, while the mean maximum flow rate was 7.63ml/s as shown in Table 1.

Table 1: Descriptive statistics of the study population(n ≥ 76)

Parameters	Successful Mean ± SD	Unsuccessful Mean ± SD	Total Mean ± SD	t-test	p-value
Urine volume (mls)	691.83±123.83	715.60±134.60	708.41±131.07	0.724	0.471
Prostate volume (mls)	64.52±22.25	86.89±4.88	80.12±4.37	2.098	0.039
PSA (ng/ml)	4.40±1.80	4.91±2.22	4.76±2.11	0.972	0.334
FBG (mmol/l)	4.36±0.73	4.62±0.78	4.54±0.77	1.328	0.188
Voided volume (mls)	166.30±15.67	55.00±5.44	88.68±6.17	13.004	0.001
Maximum flow rate (ml/s)	13.91±5.60	4.96±3.16	7.63±5.75	8.873	0.001
Average flow rate (ml/s)	8.65±1.97	2.79±2.20	4.57±3.44	10.982	0.001

The mean scores of IPSS storage, IPSS voiding, and IPSS total were 9.00, 10.64, and 19.55,respectively. Twenty-three patients (30.3%) had a successful TWOC.

The area under the curve (AUC) of ROC for IPSS storage and the outcome of TWOC was 0.768 (p <0.0001), sensitivity of 86.96%, specificity of 56.60%, and cut-off value of 9. The positive predictive value (PPV) and negative predictive value (NPV) for IPSS storage were 46.5% and 90.9%, respectively.

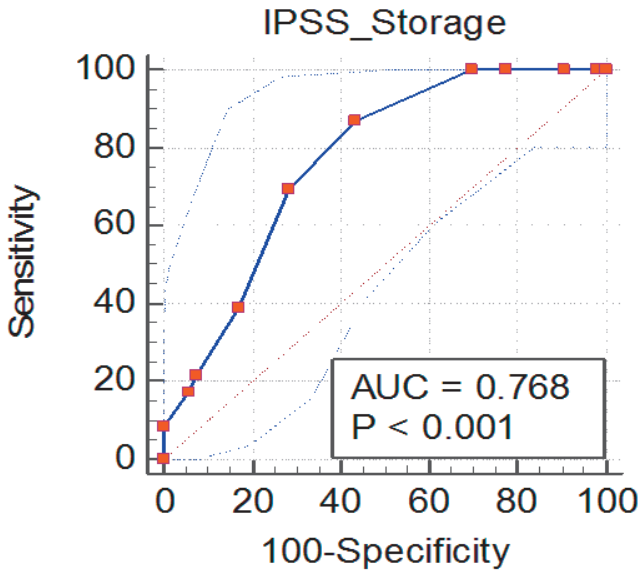

Figure 2

The AUC of ROC for IPSS voiding and outcome of TWOCis shown in Figure 3. The sensitivity was 86.96%, specificity was 62.26%, and a cut-off value of 10. The PPV and NPV for IPSS voiding were 50.0% and 91.7%, respectively.

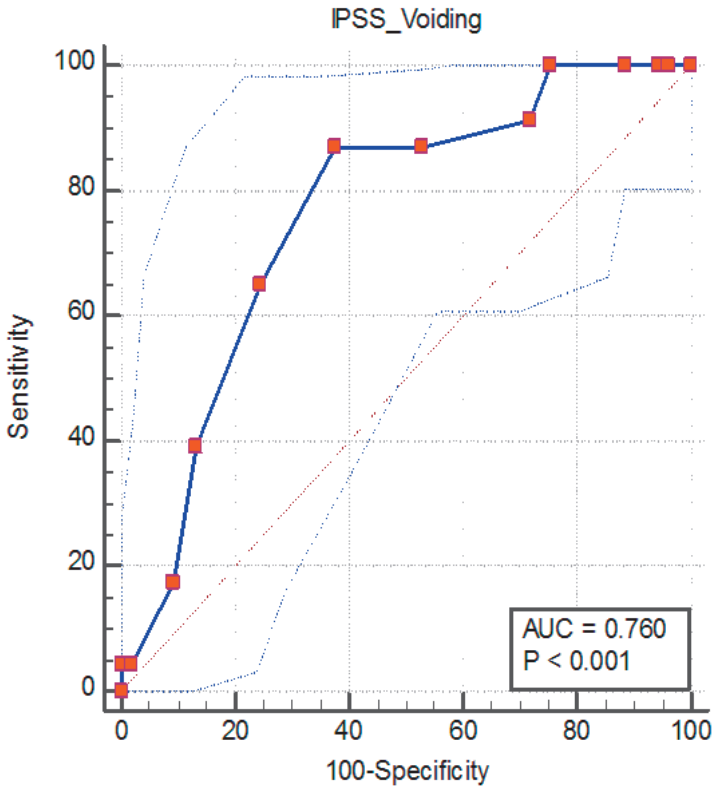

Figure 3

The AUC of ROC for IPSS total and the outcome of TWOCis shown in Figure 4. It has a sensitivity of 91.30%, specificity of 58.49%, and cut-off value of 20. The PPV and NPV for IPSS total were 48.8%% and 93.9%, respectively.

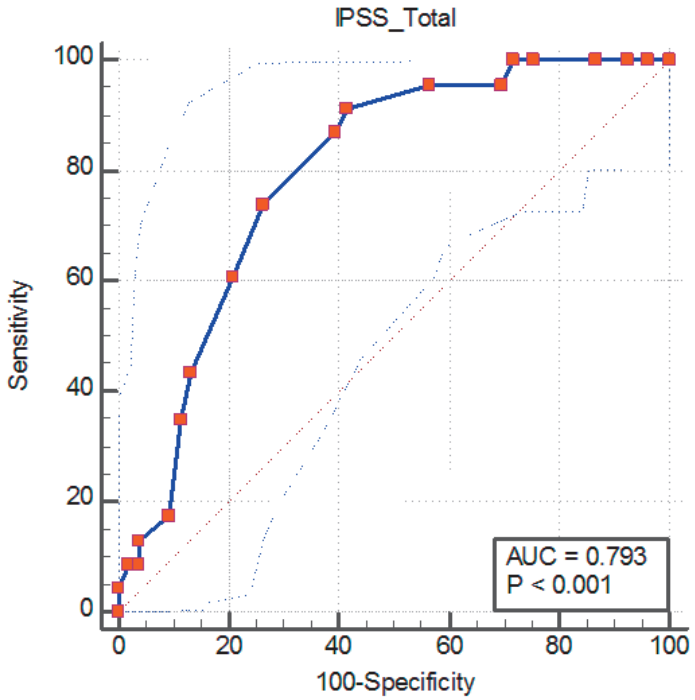

Figure 4

Discussion

This study was designed to determine the predictive value of IPSS storage, IPSS voiding, and IPSS total on the outcome of TWOC in patients presenting with AUR from BPH.

In this study, seventy-six (76) patients who presented with AUR from BPH were studied. This study demonstrated that AUR was commonest among patients within the age range of 60 to 69 years with percentage 48.68%. This is similar to a study by Adegun et al.[21] in Ekiti where the commonest age range for AUR was 60 to 69 years with a percentage of 33%.

This study showed that the mean urine volume drained following relief of retention, and mean prostate volume were 708.41 ml and 80.12 ml, respectively which is similar to a study by Mohammed et al.[22]in Egypt, which revealed mean urine volume drained and mean prostate volume of 672.6 ml and 59.7 ml, respectively. This is contrary to a study by Mahadik et al.[23]

who reported a mean urine volume drained of 854.8 ml. This study and the study by Mohammed et al. had as an exclusion criterion of patients with initial urine drained of>1000 ml, while Mahadik etal. excluded patients with initial urine volume drained >1200 ml. This might be responsible for the high mean of urine drained reported by Mahadik et al.

In this study, the mean IPSS storage, mean IPSS voiding, and mean IPSS total were 9.00, 10.64, and 19.55, respectively. The mean IPSS total is similar to the study by Mahakalkar et al.[24] who reported a mean IPSS total of 17.45. This is contrary to the study by Mohammed et al.[22] in Egypt, who recorded 13.25 as the mean IPSS total. Mohammed et al. adopted a patient self-

administration of IPSS and the IPSS was validated in their local language before use, while this study employed a patient self-administered IPSS that was not validated in the patients' local languages. The study by Mahakalkar et al. employed an author administered method of IPSS.

Twenty-three patients (30.3%) had a successful TWOC, while 53 patients (69.7%) had failed TWOC after three days of urethral catheterization. This is similar to a work done by Farelo-Trejos et al.[25]in Argentina, where 38% had a successful TWOC on the third day post relief of retention. It is also similar to a study by Bhomi et al.[26]in Nepal who revealed a successful TWOC in 43.75% of patients on the third day post relief of retention. However, this is contrary to the study byAdegun et al. in Ekiti which showed that 68% of patients that had Tamsulosin and TWOC three days post relief of retention had a successful TWOC. It is also contrary to a study by Mohammed et al. who reported 60% successful TWOC on the third day post relief of retention. Though patients in this study and the compared studies had Tamsulosin before TWOC,

differences in the definition of success following TWOC could be the reason for the difference[20-26.] This study defined success as the ability to pass ≥ 150 ml of urine and maximum flow rate of 10 ml/s[20]. Adegun et al. defined successful TWOC as ability to void without difficulty or the aid of catheter. Mohammed et al. defined success as ability to void greater than 200 ml of urine following TWOC.

This study showed that IPSS total significantly predicted the outcome of TWOC following AUR from BPH. A patient with IPSS total of ≥20 is more likely to have a successful TWOC, while those with IPSS >20 have less probability of successful TWOC. This is similar to the work by Bansal et al.[27], Bhomi et al.[26], and Mohammed et al.[22] which revealed that IPSS total predicted the outcome of TWOC. Bansal et al.found that patients with IPSS total >20, had less probability of successful TWOC following AUR from BPH. Bhomi et al. reported that patient with IPSS total of >16 had less probability of having a successful TWOC. However, Lodh et al.[28] in India found out that IPSS does not predict outcome of TWOC. The finding by Lodh et al. might be due to the method of obtaining IPSS which was dependent on the educational level of the patients or inability of the patients to completely comprehend IPSS when explained by the investigators.

This study also revealed that IPSS storage significantly predicted the outcome of TWOC in patients with AUR from BPH. Patients with BPH who have an IPSS storage of ≥ 9 are more likely to have a successful TWOC following AUR. IPSS storage was found to have a lower PPV and NPV compared to that of IPSS total.

It was also found that IPSS voiding predicted the

outcome of TWOC in patients with AUR from BPH, and patients with an IPSS voiding of ≥10 are more likely to have a successful TWOC. IPSS voiding had the highest PPV, however, had a lower NPV than IPSS total. IPSS voiding had the best predictive value for a successful TWOC following relief of AUR from BPH.

The high NPV of patients with IPSS total (cut-off ≥ 20), IPSS voiding (cut-off≥ 10), and IPSS storage (cut-off ≥9) means IPSS and its sub-scores are good tools in predicting an unsuccessful TWOC. IPSS voiding had the best predictive value for success while IPSS total had the best predictive value for an unsuccessful TWOC. This study has shown that IPSS is a useful tool in predicting outcome of TWOC.

Conclusion

This study shows that IPSS storage, IPSS voiding, and IPSS total significantly predicted the outcome of TWOC in patients presenting with AUR from BPH with a cut-off value of 9, 10, and 20, respectively. IPSS is therefore a valuable tool in determining the outcome of TWOC in patients presenting with AUR from BPH. Patients with AUR from BPH with an initial IPSS storage, IPSS voiding, and IPSS total greater than 9, 10 and 20 respectively are unlikely to have a successful TWOC.

Recommendations

1. IPSS should be included in the armamentarium for the initial assessment of men with AUR from BPH. This is to avoid an unnecessary TWOC in patients with AUR from BPH. Patients with AUR from BPH with an IPSS total >20, IPSS voiding >10, or IPSS storage of >9 should be counseled and worked up for an early intervention rather than TWOC.

2. Further studies need to be carried out to corroborate the correlations between IPSS sub-scores and the outcome of TWOC, so that it can gain wider acceptance among urologists.

Acknowledgements

Competing interests

The authors declare that they have no competing interests.

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APPENDIX I: INTERNATIONAL PROSTATE SYMPTOM SCORE (IPSS)

International Prostate Symptom Score (I-PSS)[1]

Date_____

Circle your score for each below.

	Not at all	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always
1 Over the past month or so, how often have you had a sensation of not emptying your bladder completely after you finished urinating?	0	1	2	3	4	5
2 Over the past month or so, how often have you had to urinate again less than two hours after you finished urinating?	0	1	2	3	4	5
3 Over the past month or so, how often have you found that you stopped and started again several times when you urinated?	0	1	2	3	4	5
4 Over the past month or so, how often have you found it difficult to postpone urination?	0	1	2	3	4	5
5 Over the past month or so, how often have you had a weak urinary stream?	0	1	2	3	4	5
6 Over the past month or so, how often have you had to push or strain to begin urination?	0	1	2	3	4	5

7 Over the last month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning?	None	1 time	2 times	3 times	4 times	5 or more times
	0	1	2	3	4	5

Total Symptom Score =

Sum of Questions 1 to 7 = ☐ /35

Quality of Life Due to Urinary Symptoms

	Delighted	Pleased	Mostly satisfied	Mixed about equally satisfied and dissatisfied	Mostly dissatisfied	Unhappy	Terrible
1 If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	0	1	2	3	4	5	6

Quality of Life Assessment Index L = ☐

MANAGEMENT OF PENILE FRACTURE AT KEFFI, NORTH CENTRAL NIGERIA-CASE SERIES

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ABSTRACT

Background
Fracture of the penis is a urological emergency. It is infrequent though increasing in our environment due to rise in over-zealous and vigorous sexual practices.

Patients
Four cases of penile fracture managed at our centre whose ages range between 25 - 45 years and who presented at three days, two weeks, one week, and three hours duration respectively. Diagnosis was made by clinical history and examination findings suggestive of penile fracture.

Intervention
All the patients had surgical repair of the rents in the tunica albuginea and a primary urethroplasty for the patient who had an associated urethral injury. The repairs were done using a vicryl suture.

Results
Two patients had penile fracture following sexual intercourse (one was from reverse coital position) and the other two had penile fracture from masturbation with one having associated urethral rupture. The four patients had surgical repair. Two of the patients had satisfactory sexual function and voiding post repair and two defaulted on follow-up.

Conclusion
Most patients with penile fracture still present late in our environment. Immediate surgical repair is advocated in order to ameliorate morbidity.
Keywords: penile fracture, tunica albuginea, detumescence, repair, erectile dysfunction.

Introduction

Penile fracture is a urological emergency which is described as the disruption of the tunica albuginea with rupture of the corpus carvenosum.[1,2] It is mainly caused by trauma to the erect penis either during sexual intercourse or during penile massage, masturbation or when an erect penis is forcefully manipulated or bentand during a fall on an erect penis.[1,2,3] The pathology is as a result of laceration or tear in the tunica albuginea which is the covering of the erectile bodies, corporal cavernosa with concomitant tear of the Buck's fascia as well. The rupture may extend to the corpus spongiosum and the urethra.[4] Presentations are penile pain, immediate penile detumescence, penile swelling, discoloration and deformity. Penile hematoma usually results as blood extravasate from the cavernosal sinusoids into the sub-dartos space.[1,2] The extent of hematoma depends on the integrity of the Buck's fascia following penile fracture, it may be limited to the skin and tunica if the Buck's fascia remains intact resulting in an eggplant deformity (Aubergine sign) or extends to the scrotum, perineum or suprapubic region if the Buck's fascia is breeched.[2]

Prompt surgical repair is the standard care as most conservative approaches have been found not to yield satisfactory outcomes.[4,5,6] Common complications that may follow conservative treatment include painful erection, penile angulations, penile plaque formation, arterio-venous malformations and erectile dysfunction.[5,6]

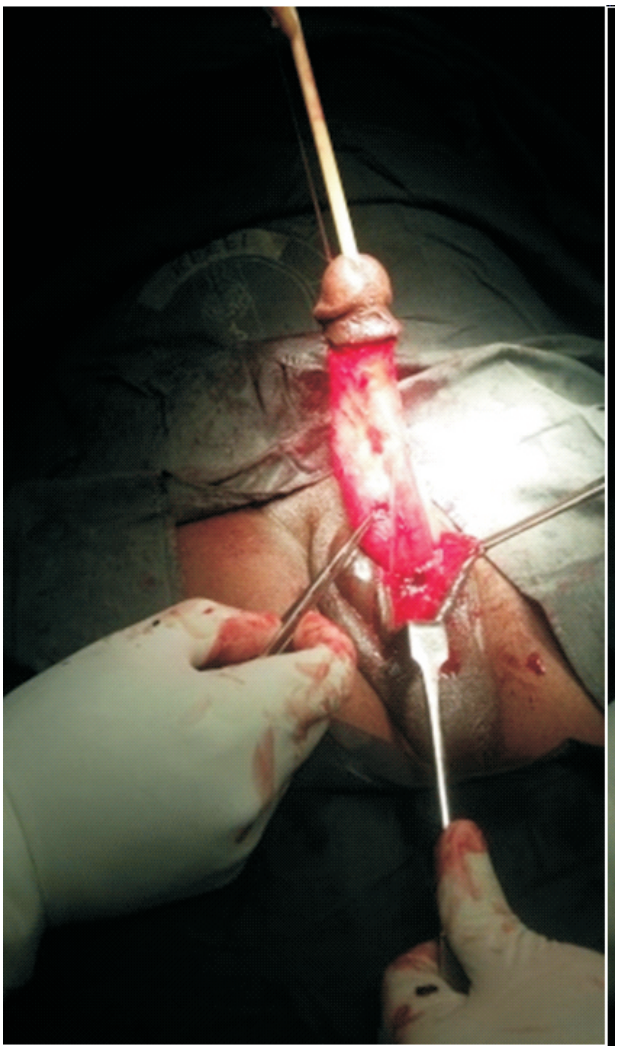
In this case series, we presented four cases managed at our centre in 2019.

Case 1

O.G. is a 28-year old male undergraduate who presented with complaints of penile swelling and abnormal curvature of 3days duration. He sustained injury to the erect penis while having sexual intercourse with his girlfriend. His turgid penis slipped out of the vagina and hit the inner part of the girl's thigh. This led to abrupt detumescence, painful penile swelling and sideways curvature of the penis. There was no difficulty in voiding or urethral bleeding.

Examination revealed a young man in good general condition but with swollen penile shaft which was tender and curved towards the right side. A size 16Fr urethral catheter was passed and intravenous antibiotics commenced. He then had penile exploration via a distal circumcising incision with degloving of the penis under spinal anaesthesia. Intraoperative findings were edematous phallus, angulated at the base, moderate sub-dartos hematoma and 2cm laceration on the tunica albuginea at the base and 1cm mid shaft laceration of the right corpus cavernosum. The lacerations on the tunica albuginea were repaired with 3/0 vicryl in continuous fashion. The urethral catheter was removed 72hours after wound review.

The patient did well after surgery and was discharged to the clinic for follow up. He was satisfied with his erectile function and no other adverse outcome post operatively.



Degloved penile shaft showing the 2 laceration sites on the tunica albuginea

Case 2

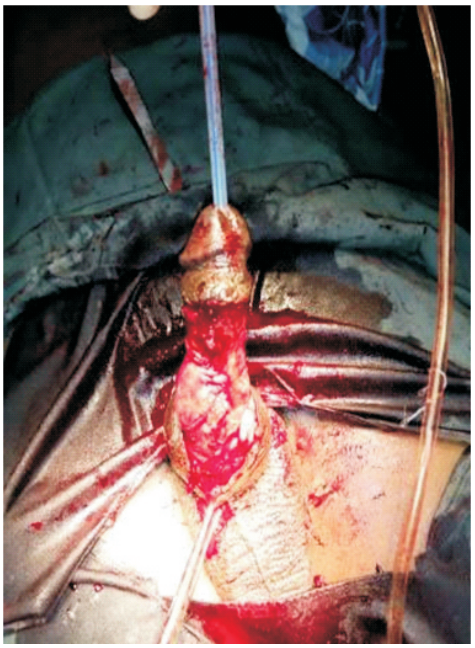
K.S is a 30-year old commercial driver who was brought into the accident and emergency department with complaints of penile swelling and pain which followed injury sustained 2 weeks earlier during sexual intercourse with his girlfriend. The woman squatted on him while the patient was on his back during the intercourse. His erect penis accidentally slipped out of the vagina and hit the perineum of the woman. He heard a crack sound followed by complete detumescence of the penis and progressive painful swelling. There was no difficulty in voiding or bleeding per urethra. He had futile management efforts initially in a private hospital for 2 weeks with intravenous antibiotics and analgesics before he was referred to our department.

Examination revealed an asymmetrically swollen penis mainly on the right side of the shaft. There was slight tenderness.

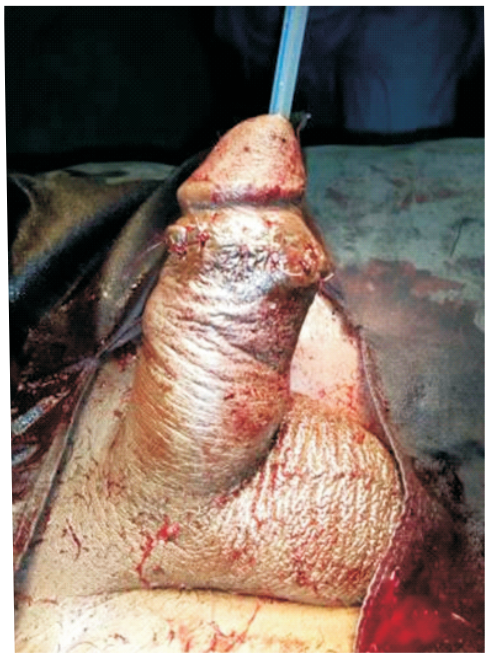
A diagnosis of improperly managed penile fracture was made. He had penile exploration under spinal anesthesia. A circumcisingincision and degloving of the penis was made with findings at surgery of extensive tear on the right side of tunica albuginea measuring 8cm x 3cm. This was repaired with vicryl 3/0 sutures and firm penile dressing was applied. He developed surgical site infection and superficial wound dehiscence which was managed with daily dressing and oral antibiotics. Wound healed by secondary intention and he was subsequently discharged to the outpatient clinic. He defaulted follow up and as such a history of erectile function was not ascertained.

(a) Markedly swollen penis following penile fracture

(b) extensive laceration on right tunica albuginea



(c) Repaired tunica albuginea



(d) skin closure

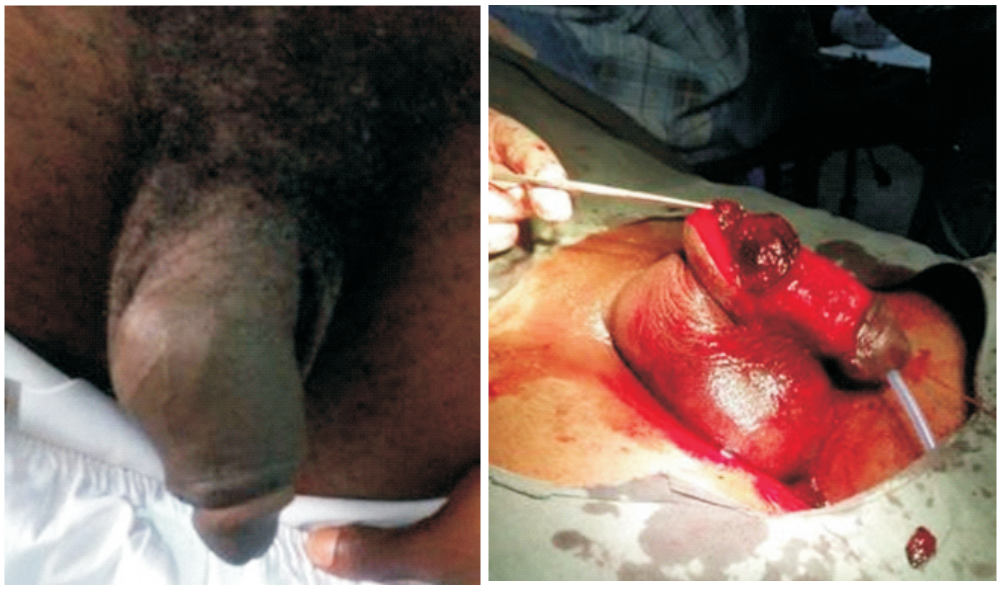
Case 3

I.M. is a 26-year old medical records officer who presented with complaints of penile swelling of 2weeks duration. He sustained blunt penile injury during masturbation and developed painful penile swelling and abnormal curvature thereafter. He managed himself at home by self-administering oral antibiotics and analgesics for 1 week after which he presented to our hospital when there was no improvement.

External genitalia examination showed swollen penis which was tender and fluctuant.

A diagnosis of neglected penile fracture was made. Had penile exploration under spinal anaesthesia. A distal circumcising incision and degloving of the penis was made and the intraoperative findings were edematous phallus at the midshaft, with adhesions, sub-dartos hematoma and 4cm x 2cm ragged longitudinal laceration of the right corpora cavernosum.

Hematoma evacuation was done and tunica albuginea repaired with 4/0 vicryl



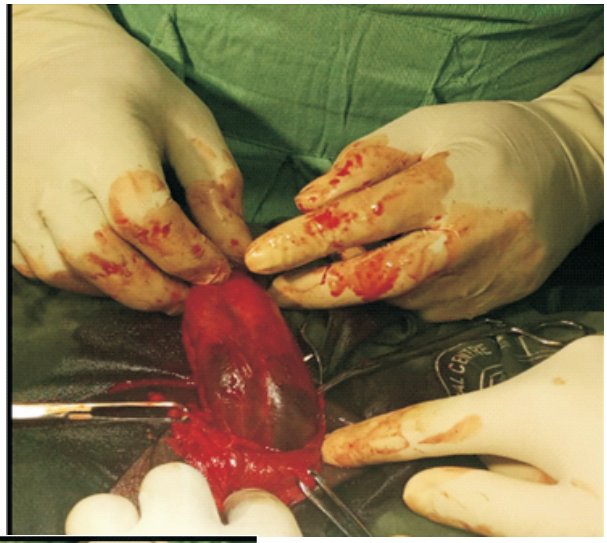
Penile shaft at presentation (left) and intraoperative findings of hematoma after degloving of the penis. There was a wide defect on the tunica albuginea of the right corpora carvernosum (right)

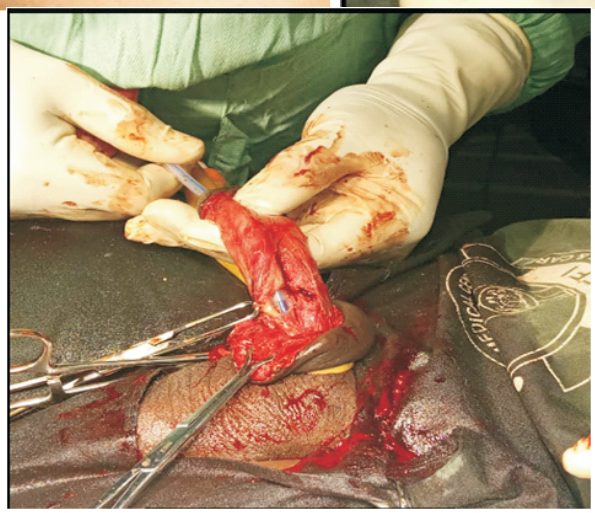
Case 4

A.A. is a 38 year old civil servant who presented with complaints of penile pain and abnormal curvature of3hours duration which resulted from a fall on an erect penis following masturbation while watching a "porn movie". There was apop sound, sharp pain with immediate detumescence and abnormal curvature of the penis. He developed bleeding per urethra subsequently.

On examination, he was anxious looking and in mild painful distress with asymmetrical swollen penis with lateral curvature to the left of the phallusand blood at the external urethral meatus. He had mild suprapubic distension that was mildly tender.

A diagnosis of penile fracture with urethral rupture was made. He had immediate penile exploration under spinal anaesthesia. A distal circumcising incision with degloving of the penis was made with intraoperative findings of sub-dartos hematoma collection, 2 cm x 3 cm right sided tunica albuginea rent at ventral proximal shaft, and 1.5 cm longitudinal rent on the ventral urethral wall. Four hundred mls of bloody urine was drained from the urinary bladder when urethral catheter was passed transurethrally after penile degloving. Primary repairs of the tunica albuginea and urethra were done using vicryl 3/0 and 4/0 sutures respectively, over a size 16 Fr silicon urethral catheter earlier passed. Occlusive dressing was done with penile elevation. Urethral stent was removed 2 weeks post-operative and he had satisfactory urinary stream and erectile function. He was counseled to abstain from sexual activities for 3 months.





Discussion

Penile fracture is common among young men usually less that forty years of age who constitute the bulk of active sexual population and usually occurs during vigorous sexual intercourse.[1] Most cases occur during consensual intercourse[7] and more likely when the female partner is on top.[8] In our series the age range was 25 –45 years similar to the range reported in previous studies.[1,9]

Majority of patients will hear a sudden cracking sound of the erect penis once the fracture occurs with sudden detumescence. Penile pain and swelling on the side of the fracture eventually result.[4]When the corpus spongiosum and the urethra are involved, the patient may present with hematuria(microscopic or gross) and difficulty in passing urine.[4]

The patients may choose not to seek medical attention with a specialist on time due to embarrassment,[3] in some cases due to the fact that penile factures occurred during illicit sexual acts or during extramarital sex.[2] Two of the three cases presented late due to the reasons above.

In most cases, diagnosis is made by detailed clinical history and physical examination alone. In unusual cases, corporal carvenosography may show a filling defect and extravasation of contrast at the suspected site. Corporal ultrasonography and magnetic resonance imaging(MRI) may also help in making a diagnosis by localizing corporal injuries. Urinalysis may show microscopic or gross hematuria in cases of associated urethral injuries and retrograde urethrocystography is useful to diagnose urethral injuries and urethral stricture that may develop later.[4,6]

Various conservative approaches of care used in the past included the use of ice packs, urethral catheterisation, penile splints, erection-inhibiting estrogens and anti-inflammatory drugs, fibrinolytics agents and so on.[6] These were associated with poor outcome and high rates of complications. The standard care therefore is immediate surgical repair of the tunica albuginea.[1,5,6,10]

The common side of rupture was the right side.[11,12] This is the same with our series. Associated urethral injury if present is managed with urinary diversion and urethroplasty either immediately or at a later date.[3,4,12]One of the patients in our case series had associated urethral laceration which was repaired primarily over a urethral stent. This was because it was a linear rent and he had no urethral tissue loss.

The early postoperative complications include surgical site infection, infected hematomas, abscess formation, wound dehiscence, and penile skin necrosis while on the long run some patients may develop painful erection, arterio-venous fistula formation, erectile dysfunction, penile plaque formation, urethral stricture, and penile chordee.[1,6,13] In our series, a patient developed superficial surgical site infection which healed by secondary intention following daily wound dressing. One of the patients was lost to follow up and there was no aforementioned complications found in other patients.

Conclusion

Penile fracture is an avoidable urological emergency which may lead to significant morbidity if there is delayed presentation. Sex education is paramount among young men, as this will ameliorate vigorous sexual behaviours which is the common cause of penile fracture of the presented cases. Emphasis on prompt surgical intervention is the key to avert erectile dysfunction and decreased morbidity.

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IMPROVISING A SURGICAL DRAIN WITH AN INFUSION GIVING SET AND AN EMPTY SALINE CONTAINER: AN IMPROVISED SURGICAL TECHNOLOGY CASE REPORT. STEP BY STEP IMPROVISED DRAIN

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ABSTRACT

Background
Improvisation is key to surmounting challenges of unavailability and prohibitive cost of surgical staff, stuff, space, and systems in Low- and Middle-Income Country contexts. We describe a step-by-step method for construction of an improvised surgical drain which has been used at our institution following thyroidectomies and mastectomies requiring drainage in a setting of resource constraints for over 20 years.

Patients
The drain has found use in surgical wound drainage following thyroidectomy, mastectomy, and laparotomy for patients with indications for drainage.

Intervention
In this surgical technology case report, we describe the 7-step process for fashioning and deploying this low-cost, low negative-pressure, closed tube surgical drain from an empty 500 mL normal saline collapsible plastic container, and an intravenous fluid giving set. The drain generates a calculated maximum opening negative pressure of 1 5 kPa, calculated by Bernoulli equation and costs about 1.1 USD.

Conclusion
The technological simplicity of this low-cost improvised, negative pressure, closed tube drain for thyroid, breast, and abdominal surgeries in low resource settings constructed from a 500 mL infusion bag and an intravenous fluid giving set is apparent. The drain's bio-mechanical efficiency and cost effectiveness must be validated against standard custom-made drains. Some randomised control studies are being carried out to that effect.

Keywords Improvised, surgical drain, Low resource, Case report, Low cost

Introduction

A drain is a device that acts as a deliberate channel through which established or potential collections (pus, blood, air, or body fluids) egress to allow gradual collapse, apposition of tissue, and reduction in cavity pressure.[1] Currently, a gamut of eponymous and commercial custom made drains exist[2].Despite age long controversies, the selective or routine use of drains in thyroid, breast, abdominal, orthopaedic, and plastic surgery is common practice. Indications for applying surgical drains could be therapeutic, diagnostic, prophylactic, or monitoring; however, the placement of a drain is not a replacement for good surgical technique or adequate haemostasis.[1] Improvisation is critical to surgical practice in sub-Saharan Africa.A teeming populace juxtaposed with relatively poor health-care facilities and funding challenges have made it imperative to look for alternative local sources of essential surgical equipment.[3] Improvisation is driven by financial factors like high out of pocket expenditure, resulting from low insurance penetration, and heightened risk of catastrophic expenditure[3]. The cost of surgical devices like drains contribute to this narrative .Surgical practitioners must arrive at creative solutions generated using locally accessible alternatives in limited resource settings.[3] We describe an improvised, negative pressure, closed tube drain fashioned using an infusion giving set and a semi rigid infusion bag)that has been in use at our institution for over two decades . It has found use in wound drainage following thyroidectomy ,mastectomy ,and laparotomy .The utility of such a drain has previously been mentioned in a letter to the editor[4], but a detailed step by step process of construction for this drain has ,however ,to the best of our knowledge ,not been previously described in literature .

Improvised Surgical Technology Case Report

Materials needed for the construction of the improvised negative pressure drain is shown in Table 1.

S/N	Materials for Drain Construction	Comment
1.	1 empty 500 mL Normal Saline[a] collapsibleplastic bottle	Uncontaminated[b,c]
2.	1 intravenous fluid infusion giving set	New, do not reuse
3.	1 pair stitch-cutting scissors	
4.	1 curved artery forceps (curved hemostat)	
5.	1 needle driver (needle holder)	
6.	Vicryl® 2-0 suture	Vicryl® 3-0 is an alternative
7.	1 Toothed dissecting forceps	

Table 1: Materials needed

a. A normal saline bottle is preferred, as dextrose containing fluid bags may theoretically encourage the growth of glucophagic microorganisms in the residual fluid and encourage wound infection.

b. Precautions to be taken to avoid contamination of the used intravenous fluid container include avoiding the use of fluid containers punctured with hypodermic needles and ensuring seamless, immediate transfer from the intravenous fluid giving set to the improvised drain without handling the punctured end.

c. The use of visibly soiled or leaking fluid bags is avoided.

Method

1. First, the distal portion of the infusion giving set is shortened from the patient end, leaving about a 30 cm length distal to the drip chamber incorporating the control valve (Figure 1, 2).
2. An even longitudinal slit is then made from the distal end 10-15 cm long using stitch scissors with one blade insinuated into the giving set lumen and the other outside the lumen (Figure 3). The slit end was the intra-wound portion. The creation of multiple fenestrations along the distal 8 cm of the tube at 2 cm intervals is an alternative to slitting.
3. A medium-sized blunt artery forceps is used to create a passage from the space to be drained,

through the overlying tissue from in to out. These forcepsis used to grasp the intra-wound portion of the prepared improvised drain. This is then drawn into the anatomical cavity and the drain is positioned appropriately.

4. The surgeon ensures that the proximal end of the slit or the last fenestration is at least 2 cm from the skin. The wound is then closed over the drain as appropriate.

5. A modified Roman garter technique is then used to anchor the improvised drain. This is achieved by passing Vicryl® 2-0 suture through the skin beneath the exit of the drain and winding the two ends of the suture in opposite directions over the drain to encircle and secure it like a sandal lace.

6. After securing the drain to the skin with suture, an empty fluid bag is collapsed by serial folding from the base to produce a visual concertina-like effect thus generating a negative pressure.

7. The bag end of the giving set is then inserted into the empty collapsed fluid bag to produce a closed, negative pressure system (Figures 4, 5).

8. Where the plastic reservoir loses its recoil potential, the entire system drainage slows or stops, and the drain becomes non-functional. Attention must be placed on adequate intermittent recharge depending on collection, daily monitoring of functionality, and replacement of any deficient, leaking, or non-compliant reservoirs and other standardized care of drains.1

Discussion

We have described a simple but effective improvised drain fashioned from readily available materials that can be found in almost any healthcare facility. Several improvised drains have been used in place of custom-made drains on account of cost and availability. Ezeome and Adebamowo described a simple, closed drain fashioned out of a feeding tube with multiple fenestrations along the intra-wound section connected to a urine drainage bag.[5] Esezobor and Okunmayin described a syringe and feeding tube or drip system as an effective closed suction drain and a low-cost alternative to conventional vacuum drains in rural surgical practice.6 Ogirima described a recycled Redivac® or Hemovac® system using the perforated end of a sterile intravenous line in place of the used manufacturer's tube and introducer.[7] Igwe and colleagues described the spring active drain of Adotey fashioned using wire from a condemned umbrella, pliers, a urine bag tube, infusion giving set, and a 50 or 60 ml syringe.[8] Adeleyeet al. described the use of a urine bag as a low-cost, passive, single unit wound drain post craniotomy.[9]

Our improvised drain is arguably one of the most affordable improvised negative pressure devices described. A single component of the improvised spring active drain described by Igweet al. costs between [2.94] USD and 5.88 USD.[9] In contrast, as at the time of writing, a giving set in our clinical setting costs 0.13 USD while an infusion bag costs 0.97 USD, bringing the total direct costs of this drain to about 1.1 USD (400 NGN). Unlike Ogirima's or Adotey's improvised drains, no component of this drain incurs additional costs of sterilisation.[8,9] Other less expensive improvised drains, like those described by Ezeomeet al., Fyne Face-Oganet al., and Adeleyeet al., are passive and cannot supply negative pressure.[6,10,11] The large potential volume of the receptacle of this drain (500 ml) is an added advantage over Esezobor and Okunmayin's syringe suction drain (2 ml) and Adotey's improvised drain (50 ml).[7,9]

Several characteristics of this drain approximate that of the theoretical ideal.1 It is neither rigid not too soft, it is smooth, resistant to early decomposition or disintegration, and non-electrogenic.1 This drain generates a calculated maximum opening negative pressure of 15.4 kPa calculated by Bernoulli equation with the assumption that there will be no loss from the system and compares well with the opening pressure of the 4.67 mm internal diameter 14 French Romovac® drain (14.66 kPa).10

The authors have varying preferences between slitting and fenestrating the improvised tube drain. Fenestration of the giving set provides multiple sites for fluid to egress into the drainage tube and mimics the customised Redivac drain design more closely. However, we have seen that the process of creating multiple fenestrations may result in accidental transection of the tube at fenestration sites. A further disadvantage of perforation over slitting is that perforated apertures tend to structurally weaken the drain.11 In the process of drain removal, jagged fenestrations may snag on tissue, vessels or clots resulting in iatrogenic injury and resultant haemorrhage, or fortuitous drain amputation at the site of a large fenestration.

Slitting mimics a fluted drain, provides an increased drain body cross sectional area, and eliminates "stress raisers" (weak points) along the drainage tube.[11] Also, inadvertent functional variability may be created by varying the number of fenestrations and their placements. Without precision instruments, fenestrations will be of varying shapes, diameters, and sizes and at different distances from each other on different drains even when the constructor is deliberate. This brings more pronounced variability to functional device assessments in randomised control trials. A prospective study comparing perforate and slit improvised drains may be necessary in the future.

Preliminary results of a randomised control trial comparing the use of this drain with a standard custom-made closed tube drain in thyroidectomy suggests equivalent efficacy and significant savings in direct costs. A randomised control trial describing its use in draining mastectomy wounds is also underway.

Conclusion

Surgical intervention need not be delayed on account of unavailability or prohibitive cost of custom-made drains in low resource settings. The technological simplicity of this low-cost improvised, negative pressure, closed tube drain for thyroid, breast, and abdominal surgery in low resource settings constructed from a 500 ml infusion bag and an intravenous fluid giving set is apparent. The materials utilised are affordable and available in virtually every clinical setting.

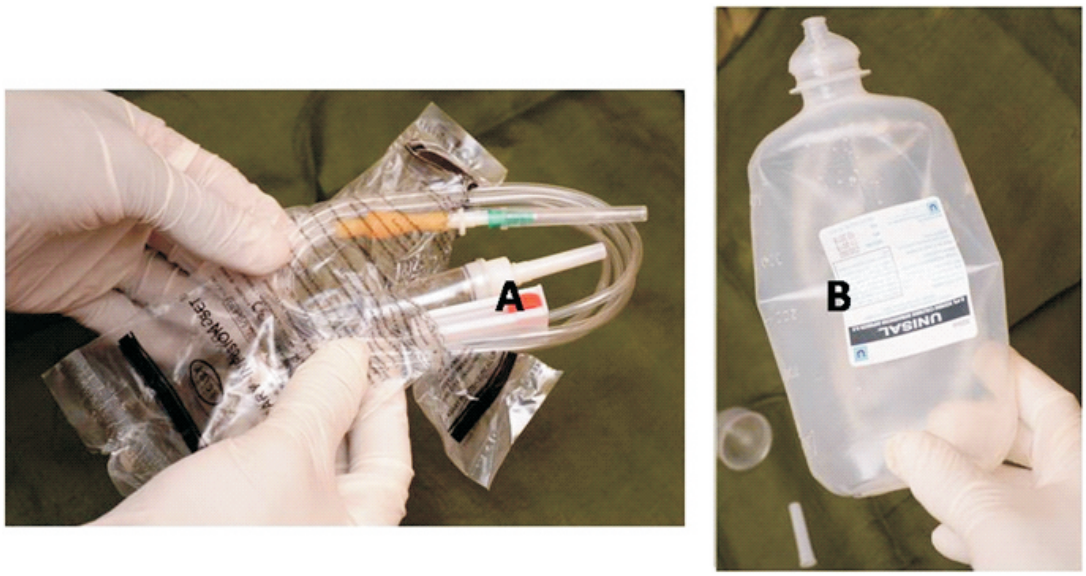

Figure 1: Materials needed for fashioning the improvised drain. (a) Unused sterile intravenous fluid giving set. (b) Collapsible, plastic 500 ml intravenous fluid container.

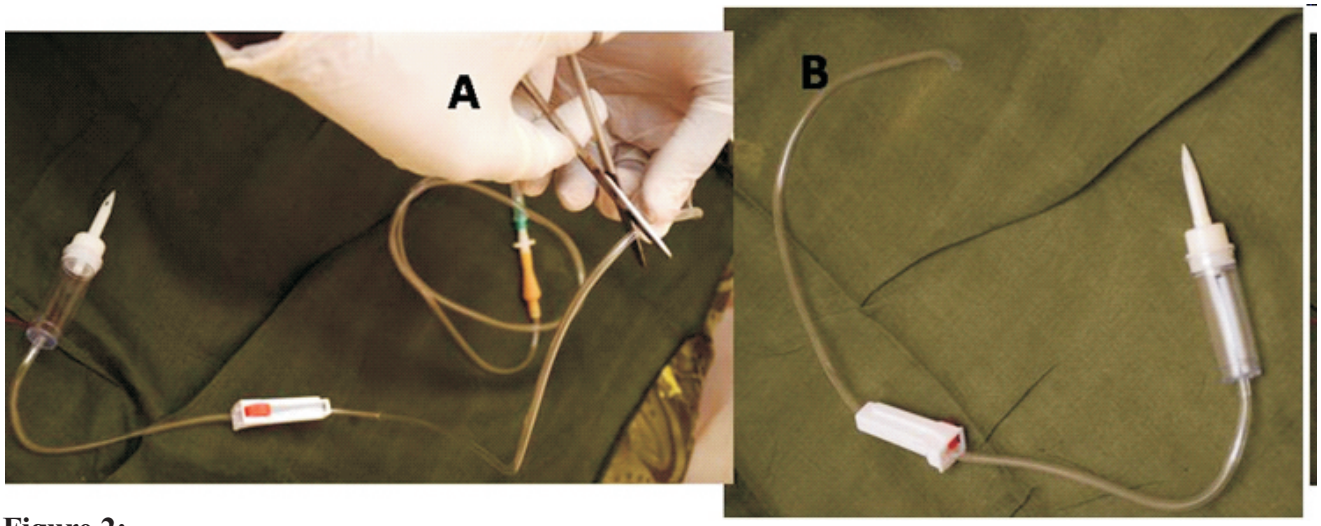

Figure 2:
(a) Shortening the giving set by cutting off the patient end. (b) The resultant shortened tube.

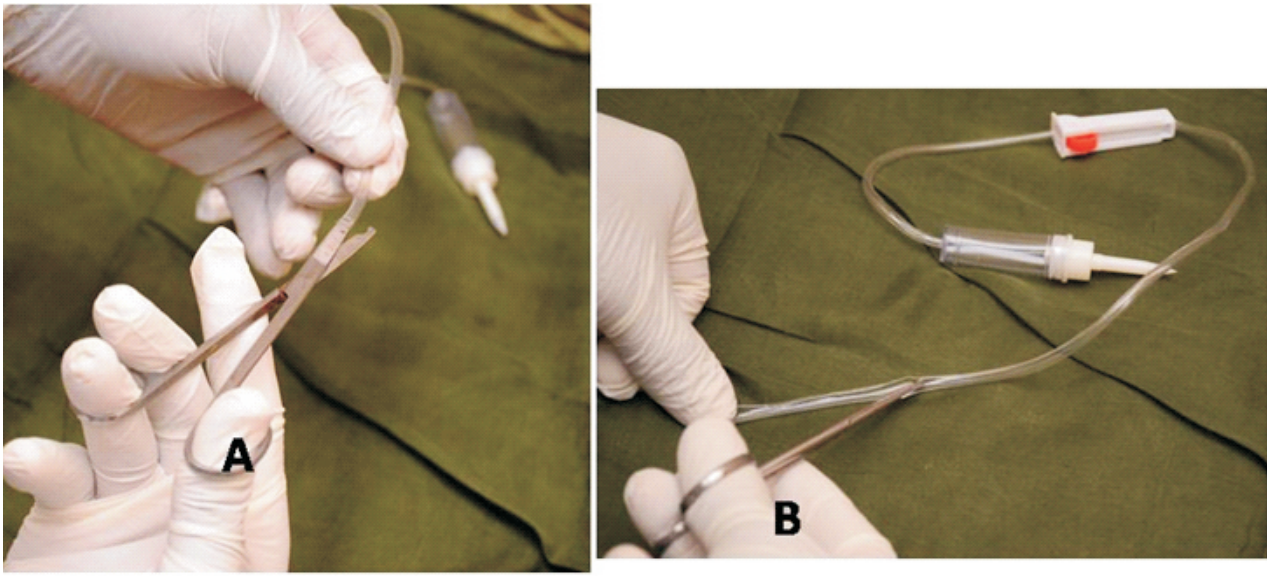

Figure 3: (a) Stitch scissors positioned to slit the lumen. (b) Slitting the lumen.

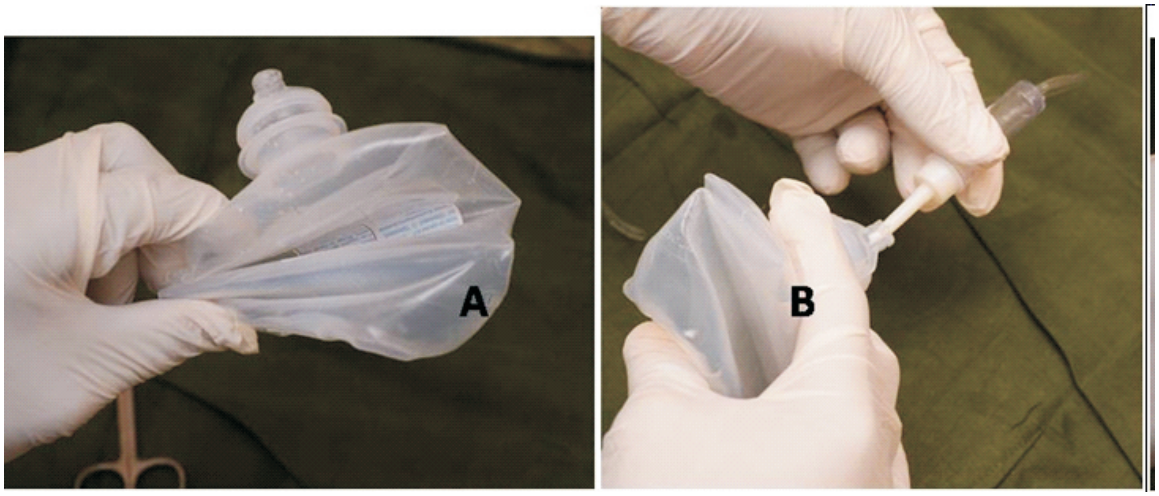

Figure 4: (a) Charging the drain reservoir for negative pressure.

(b) Completing the closed, negative pressure system by connecting the reservoir to the giving set.

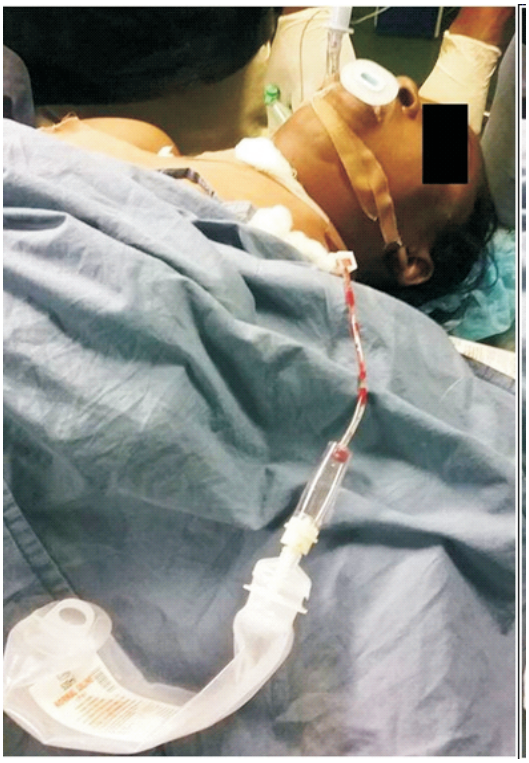

Figure 5: Patient in immediate postoperative period with improvised drain in-situ

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THE RESPONSE TO INTRA-ARTICULAR STEROID INJECTIONS IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEE: SONOGRAPHIC VERSUS PALPATION TECHNIQUE

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ABSTRACT

Background

Osteoarthritis is the most common chronic joint disease globally, intra articular steroid injection (IASI) is an option of treatment but has a huge variation in the response and duration of response. One of the reasons proposed for this variation is the extra-articular deposition of the steroid. This study is aimed at determining if there is any difference in response from traditional palpation-guided technique from the sonographic-guided technique.

Method

Fifty-four patients aged 30 to 80 years who have been diagnosed of osteoarthritis using American College of Rheumatology criteria, and have met the inclusion criteria were enrolled in the study. They were randomly divided into two cohort groups and had intra articular steroid injections into the knee either by palpation or sonographic-guided technique.

Results

The median age of the participants was 53.5±10.1 years, there was a predominance of females, there was no significant difference between the sonography group and the traditional palpation technique group except in alcohol consumption with *p-value* of 0.025.

In this study, palpation-guided methods responders are similar with the relative value of responders for the sonographic-guided method, 76.9% and 81.9%, respectively in 2 weeks using WOMAC score and 100% each using the VAS score. The WOMAC score in the group that had IASI under sonography had better pain reduction as seen in Figure 1, but the difference in response between the two groups was not statistically different.

Conclusion

In conclusion, palpation-guided intra articular steroid injection response is like the response from sonographic-guided intra articular steroid injection.

Introduction

Osteoarthritis (OA) is the most common chronic joint disease worldwide. Intra articular steroid injection (IASI) has been widely used in the management of symptomatic knee OA, the most affected joints.[1] There is evidence of short-term benefit of IASI to provide pain relief for up to 3 to 4 weeks. However, there is a huge variation in the response to intra articular steroid injection and there is a great variation in the duration of response. One of the reasons proposed for this variation is the extra-articular deposition of the steroid.[2]

Intra-articular steroid injections have been performed using anatomical landmarks to identify the correct trajectory for needle placement. However, different anatomical-guided injection techniques have yielded inconsistent intra-articular needle positioning due, in large part, to the fact that variations in anatomy are common and physician cannot directly visualize the area of interest. Incorrect needle placement has been partially attributed to variable clinical outcomes seen in the variation in response to the effect of intra articular steroid injection in the management of osteoarthritis.[3-6] Furthermore, inaccurate corticosteroid injections in the knee, for example, may result in post-injection pain, crystal synovitis, hemarthrosis, and joint sepsis, as well as systemic effects, such as fluid retention or exacerbation of hypertension or diabetes mellitus.[7] It is therefore, important to identify methods or techniques which will aid in correct needle placement during these procedures.

Accuracy of intra-articular (IA) placement of the needle by palpating surface anatomy by skilled orthopedic surgeons and rheumatologists, are dismal, with an unintended non-intra-articular injection rate as high as 50%–60%.[3,5,8,9] In contrast, sonographic image guidance routinely improves the accuracy of IA positioning of the needle tip and permits intra-articular injections with 96 – 100% accuracy.[10,11] However, there is limited evidence that routine use of sonographic needle guidance causes a clinically significant improvement in the outcome relative to traditional palpation-guided methods.[12]This study aims to see if there is any difference between the response to intra-articular steroid injection using the palpation technique to the sonographic-guidance technique.

Materials and Methods

The study was done at Jos University Teaching Hospital, Jos, Plateau state. Informed consent was taken from the patients at the time of enrolment, and the study was approved by the ethical committee of Jos University Teaching Hospital with reference number JUTH/DCS/IREC/127/XXX1994.Fifty-four patients visiting the Orthopaedic clinic, Jos University Teaching Hospital, Jos, Plateau state from October 2019 to October 2020, were included in the study by simple convenient sampling. The inclusion criteria included patient ranging from 30 to 80 years of age, diagnosed cases of OA based on American College of Rheumatology (ACR) clinical classification criterion with or without radiological support and who were not responding to conventional treatment of OA such as NSAIDs, acetaminophen and physiotherapy for more than 3 months. Exclusion criteria included known hypersensitivity to Depo Medrol 40mg and 2% Lidocaine. All patients were recruited voluntarily into the study after obtaining a written informed consent. The participants were randomly assigned to either a conventional injection by anatomic palpation or to sonographic needle guidance group by balloting.

Using the palpation technique, the superior lateral aspect of the patella was palpated one fingerbreadth above and one fingerbreadth lateral to this site with the patient supine on the table and the knee extended. Methylated spirit was used to clean the skin. A 10-mL syringe was connected to a 21-gauge, 1-inch needle. Lidocaine (Xylocaine) was injected into the skin, tilting the needle 45 degrees below the patella and 45 degrees distally into the knee. Aspiration was carried out after the needle has been inserted about one inch to 1¼ inches, and the syringe filled with fluid. Arthrocentesis was facilitated by applying pressure to the patella or the opposing side of the joint with the non-dominant hand. One mL of methylprednisolone (Depo-Medrol, 40 mg per mL) was combined with three to five mL of 2 percent lidocaine. The needle and syringe were removed following the injection of the medication. A bandage was placed over the needle puncture site after the skin had been thoroughly cleaned.

The sonographic guided technique was performed using the straight leg lateral suprapatellar bursa (superolateral) approach. Physical examination performed before the procedure confirmed the existence of suprapatellar bursal distention. To image the swollen suprapatellar bursa, the knee was extended, and the Ultrasound (US) probe was positioned transversely over the quadriceps tendon (Figure 3). A single needle was used for anesthesia, arthrocentesis, and intra-articular injection; first a syringe was used to anesthetize the synovial membrane and completely aspirate the effusion;

and then one mL of methylprednisolone (Depo-Medrol, 40 mg per mL) was combined with three to five mL of 2 percent lidocaine. The needle and syringe are removed following the injection of the medication. A bandage was placed over the needle puncture site after the skin had been thoroughly cleaned.

Prior to administration of intra-articular steroid injection (IASI) visual analogue scale (VAS) score, Western Ontario, and McMaster Universities Osteoarthritis Index (WOMAC) score and baseline parameters were measured for each subject. Under proper aseptic conditions 40 mg of methylprednisolone acetate mixed with 2% lignocaine was injected using either technique. Immediately after the injection patients were advised to observe 24-hour bed rest at home. VAS and WOMAC were calculated at 2 weeks, 4 weeks, and 3 months post IASI administration. Each participant was followed up (monthly phone calls and during clinic visits) for 3 months and documenting health-related outcomes during this period.

Prior to enrollment, full clinical history was obtained, and thorough physical examination conducted on the subjects. Relevant medical information obtained (age, sex, weight, height,) were documented. Each patient was followed up for 3 months after the intraarticular injection. Patients were required to come for follow up in 2 weeks during which thorough clinical examination was done and WOMAC and VAS scores obtained. Those absent at the first visit were called personally on phone. Same assessment was done at 6 weeks and at 3 months.

Data were serialized, completed, and double checked for completeness and then entered into Excel sheet which was subsequently exported into Statistical Package for the Social Sciences version 23.0for analysis. The WOMAC and VAS scores were transformed to a dichotomous variable of responders and non-responders. Good response (responders) is when there is 50% reduction in pain either using the WOMAC or the VAS while poor response (non-responders) is less than 50% reduction in pain using the WOMAC or the VAS. Univariate analysis of socio-demographic characteristics of the patient were done, and the basic descriptive statistics were presented in frequency and percentages. Quantitative variables were described using mean and standard deviation while qualitative variables were described using frequencies, proportions, charts, and tables. Wilcoxon ranked test was used to assess the difference in pain response between intra-articular steroid injection under sonographic-guidance group to the conventional by palpation technique group.

Results

A total of 48 patients who met the criteria were recruited for the study and were randomly divided into two groups, the first group which had intra-articular steroid injection using palpation technique had 26 patients, while the second group which had injection under US-guidance had 22 patients, 4 patients from this group were lost to follow up. About 95% of the patients were above the age of 40 years. There was a predominance of females in the two cohort groups with a total male to female ratio of 3:7 this also support the fact that the disease is more in women.[1] 54.2% of the combine group are obese and only 12.5% have normal body mass index.

Socio-demographic characteristics

Table: 1 Demographic characteristics of patient in the two cohort groups

Characteristics	Study group		Total	x^2	P-value
	Palpation n=26 f (%)	Sonography n=22 f (%)			
Age (years)					0.523[F]
<40	2 (100.0)	0 (0.0)	2 (4.2)		
40-59	16 (50.0)	16 (50.0)	32 (66.7)		
60-79	8 (57.1)	6 (42.9)	14 (29.2)		
Mean ± SD	53.6 ± 11.8	53.4 ± 7.8	53.5 ± 10.1		
Sex				0.071	0.791
Male	8 (57.1)	6 (42.9)	14 (29.2)		
Female	18(52.9)	16 (47.8)	34 (70.8)		
Education					0.025[F]
Primary	5 (29.4)	12 (70.6)	17 (35.4)		
Secondary	13 (61.9)	8 (38.1)	21 (43.8)		
Higher	8 (80.0)	2 (20.0)	10 (20.4)		
Occupation					0.283[F]
Business	2 (50.0)	2 (50.0)	4 (8.3)		
Civil servant	9 (60.0)	6 (40.0)	15 (31.3)		
Housewife	5 (33.3)	10 (66.7)	15 (31.3)		
Lecturing	2 (100.0)	0 (0.0)	2 (4.2)		
Trading	8 (66.7)	4 (33.3)	12 (25.0)		
BMI					0.511[F]
Normal	2 (33.3)	4 (66.7)	6 (12.5)		
Overweight	10 (62.5)	6 (37.5)	16 (33.3)		
Obese	14 (53.8)	12 (46.2)	24 (54.2)		
Systemic Hypertension				0.336	0.526
Yes	12 (50.0)	12 (50.0))	24 (50.0)		
No	14 (58.3)	10 (41.7)	24 (50.0)		
Alcohol				5.035	0.025*
Yes	6 (33.3)	12 (66.7)	18 (37.5)		
No	20 (66.7)	10 (33.3)	30 (62.5)		
Smoking					*0.827[Y]*
Yes	4 (66.7)	2 (33.3)	6 (12.5)		
No	22 (52.4)	20 (47.6)	42 (87.5)		

F=fishers Exact *Y=Yates Correction*

There is no significant difference between the sonography group and the conventional palpation technique group except in alcohol consumption p-value of 0.025.

Table 2: Outcome of intra-articular steroid injections based on study group

Outcome	Study group		Total	?2	P-value
	Palpation n=26 f (%)	**Sonography n=22 f (%)**			
WOMAC					
2 weeks					0.953 [Y]
Poor	6(23.1)	4(18.2)	10(21.6)		
Good	20(76.9)	18(81.8)	38(78.4)		
6 weeks					0.709 [Y]
Poor	7(26.9)	4(18.2)	11(22.9)		
Good	19(73.1)	18(81.8)	37(77.1)		
3 months				0.715	0.398
Poor	15(57.5)	10(45.5)	25(52.1)		
Good	11(42.3)	12(54.5)	23(47.9)		
VAS					
2weeks					
Poor	0(0.0)	0(0.0)	0(0.0)		
Good	26(100.0)	22(100.0)	48(100.0)		
6 weeks					0.151 [Y]
Poor	7(26.9)	2(9.1)	9(18.8)		
Good	19(73.1)	20(90.9)	39(81.3)		
3 months				0.900	0.343
Poor	13(50.0)	8(36.4)	21(43.8)		
Good	13(50.0)	14(63.6)	20(56.3)		

[Y]=*Yates Correction*

There is no statistical difference between the study group.

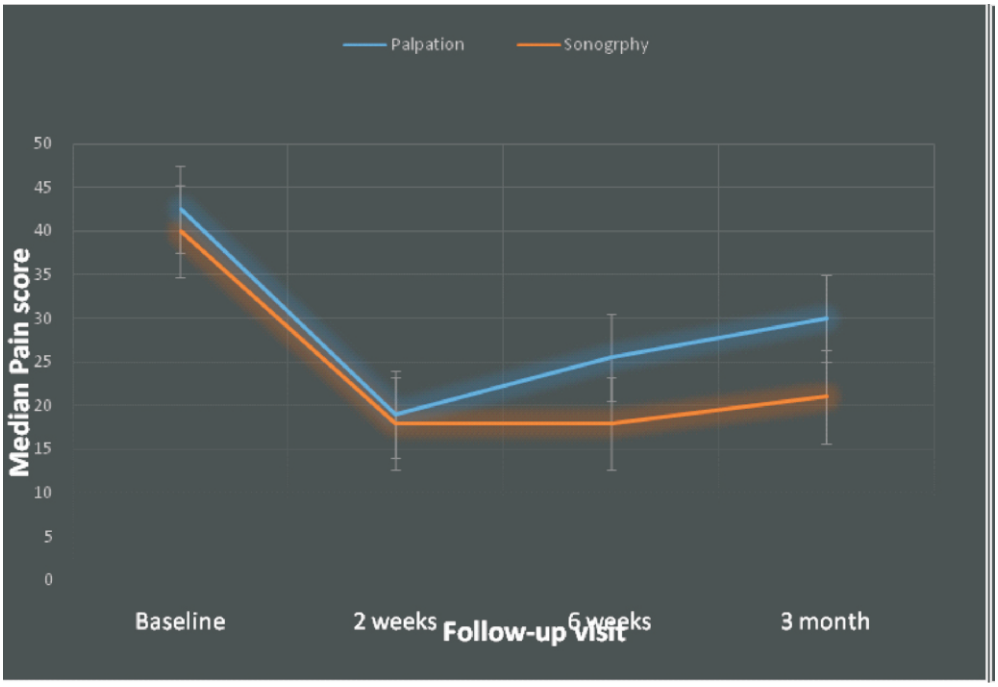

Figure1: A line graph showing median WOMAC Score at each visit

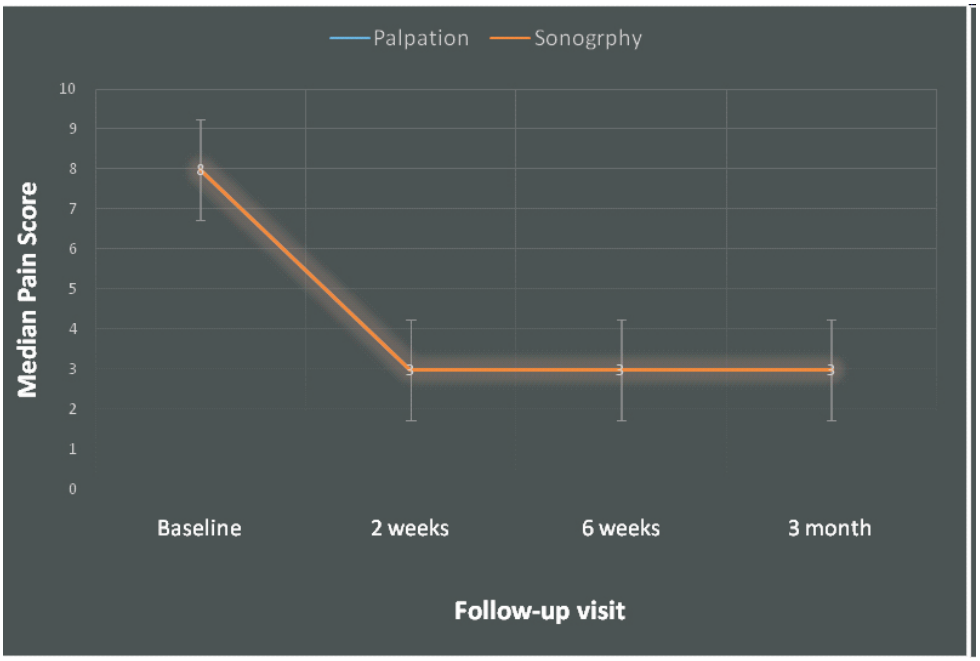

Figure2:A line graph showing median VAS Score at each visit

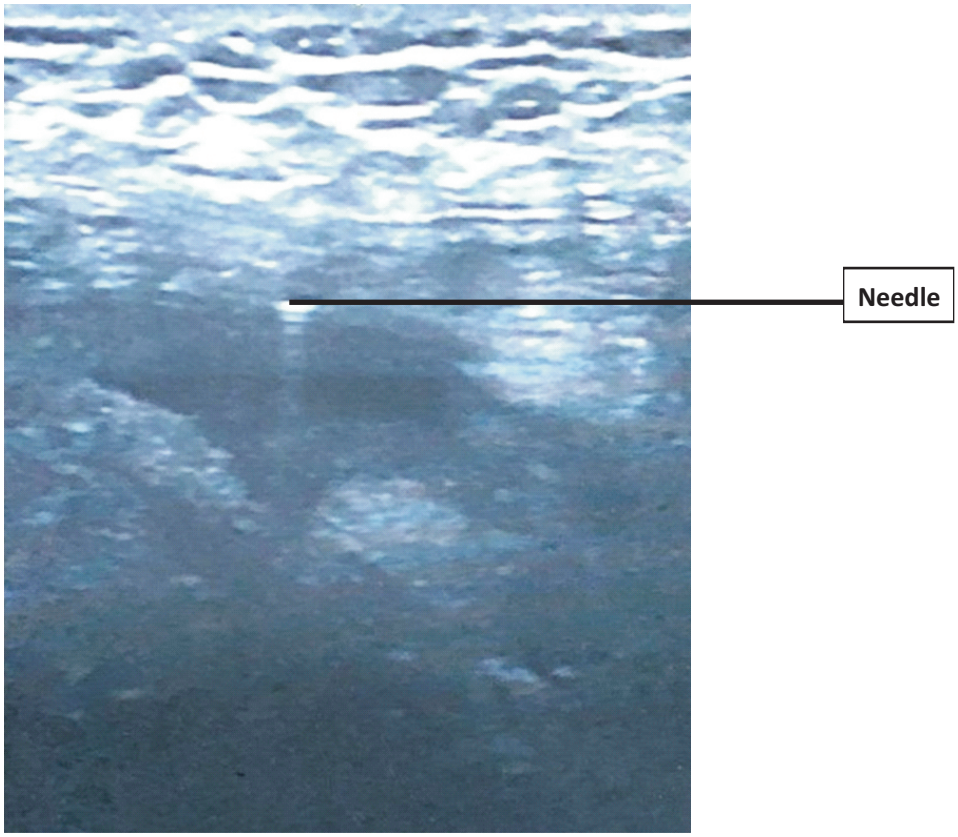

Figure 3: Ultrasound-guided needle introduction. This sonographic image shows the needle introduced into the effusion of the suprapatellar bursa from the superolateral portal with a straight positioning.

Discussion

Sonography is becoming more common among physicians who treat musculoskeletal diseases, however, questions about its wisdom and scientific explanation in clinical use have persisted as regards its daily use for all intra-articular steroid injection. There is a growing support for the widespread use of ultrasonography in outpatient musculoskeletal medicine.[8,13,14]The results from the current palpation-guided needle method is as comparable to sonographic-guided needle method, therefore, raising a reasonable level of concern regarding rising costs for ultrasonography guided injection.[15]As a result, traditional palpation-guided treatment for IA injections is preferable for routine clinic procedure, and intra articular injection guided by sonography for non-responders, or patients with challenging anatomy such as deep joints, the hip, complex joints such as tarsal-metatarsal joints, facet joints and sacroiliac joints.15-19 In this study, the responders of palpation-guided method are similar with the relative value of responders for the sonography-guided method,76.9% and 81.9%, respectively in [2] weeks using WOMAC score and 100% each using the VAS score.

However, on the other hand, there is a growing concern about the duration of response to intra articular steroid. The large variability seen in the extent and duration of response is thought to be because of extra-articular steroid injection. Since steroid when injected blindly by palpation technique as normally done in the clinic would be injected into the structures around the synovium, if true, this should account for the variability seen. It is believed that intra-articular steroid injection in the outpatient department should be under sonographic guidance. In a study where the

accuracy of intra-articular steroid injection by palpation technique was assessed for 109 injections into a variety of joints, it was discovered that about 33% of the knee and ankle injections were extra-articular. The wrist injections were obviously extra-articular 50% of the times, and shoulder injections have been reported to be less accurate.[3] Following that, similar issues have been discovered in other studies when it comes to locating the needle precisely, with a failure incidence of 12% to 70% in the subacromial bursa.[3,8,9,19-21]Despite the extra-rticular implantation, the results of response from this study were satisfactory, implying that total precision of intra-articular injection is not necessary for a good clinical response. In this study of two cohort groups, one had injection blindly by clinical palpation method while the other group had injection under ultrasound guidance, we found no significant difference in the outcome measures between the two groups at 2 weeks, 6 weeks, and 3 months. Also, using the median pain score line graph, WOMAC score in the group that had IASI under sonography had better pain reduction as seen in figure 1 which is in keeping with the finding in other studies[5,22,23] where intra-articular injection under sonographic guidance gives better results. However, the difference between the groups in the outcome measures is not statistically significant.

Conclusion

In conclusion, we found there is no significant difference between the response from intra-articular steroid injection using the palpation technique compared to sonography guided intraarticular steroid injection.

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