



## Ebola outbreak a public health emergency of international concern

- Clinical outcome of HIV in children
- Body mass index and placental morphology
- MDR tuberculosis among HIV populations
- Chronic rhinosinusitis prevalence
- HIV testing and postabortion care
- Primary Caesarean Section and parity

# SSMJ South Sudan Medical Journal

ISSN 2309 - 4605 eISSN 2309-4613 Volume 12 No 3 August 2019

A Publication of the South Sudan Doctors' Association

Ministry of Health Complex, P. O. Box 88, Juba, South Sudan

Email: [admin@southsudanmedicaljournal](mailto:admin@southsudanmedicaljournal) Website: [www.southsudanmedicaljournal.com](http://www.southsudanmedicaljournal.com)

---

## EDITORIAL BOARD

### EDITOR-IN-CHIEF

**Dr Edward Eremugo Kenyi**

South Sudan Doctors' Association  
Juba, South Sudan

### ASSOCIATE EDITORS

**Dr Wani Gindala Mena**

Department of Ophthalmology  
Juba Teaching Hospital,  
PO Box 88,  
Juba, South Sudan

**Dr Eluzai Abe Hakim**

Department of Adult Medicine & Rehabilitation  
St Mary's Hospital, Newport, Isle of Wight  
PO30 5TG, UK

### EDITORIAL ADVISOR

Ann Burgess

### EDITORS

Prof John Adwok

Dr James Ayrton

Dr Charles Bakhiet

Dr Charles Ochero Cornelio

Prof James Gita Hakim

Dr Ayat C. Jervase

Dr David Tibbutt

### EDITORIAL ASSISTANTS

Dr Nyakomi Adwok

Dr Grace Juan Soma

### DESIGN AND LAYOUT

Dr Edward Eremugo Kenyi

### ONLINE TEAM

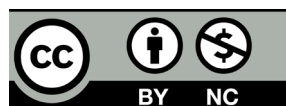
Dr Edward Eremugo Kenyi

Gore Lako Loro

Rachel Ayrton

---

## Index and Copyright Information



The South Sudan Medical Journal is a quarterly publication intended for Healthcare Professionals, both those working in the South Sudan and in other parts of the world seeking information on health in South Sudan. The Journal is published in mid-February, May, August and November.

It is an Open Access Journal licensed under a [Creative Commons Attribution - Noncommercial Works License \(CC-BY-NC 4.0\)](https://creativecommons.org/licenses/by-nc/4.0/).

**EDITORIAL**

Ebola outbreak: a public health emergency of international concern **Edward Eremugo Kenyi** ..... 84

**ORIGINAL RESEARCH**

Prevalence, clinical pattern and immediate outcomes of HIV-infected children admitted to Al Sabah Children’s Hospital, South Sudan **Gawar Gel, Sabrina B Kitaka, Victor Musiime and Hassan Chollong** .85

The effects of maternal Body Mass Index on placental morphology and foetal birth weight: a study from Dodoma Central Region, Tanzania **Elly O. Kiliopa, Peter Ainory Gesase and Athanase Lilungulu** .89

Multiple-drug resistant (MDR) tuberculosis among HIV sero-positive and sero-negative populations in Ilorin, North-Central Nigeria **Abubakar A. Abdulazeez, Adeniran A. Margaret, Nassar A.Sulaiman and Abdulazeez I. Abdulazeez** ..... 93

Prevalence of chronic rhinosinusitis at Muhimbili National Hospital, Dar es Salaam **Zephania Saitabau Abraham, Rafael Gabriel, Aveline Aloyce Kahinga, Daudi Ntunaguzi, Kassim Babu Mapondell and Elica Richard Massawe** ..... 97

The acceptability of HIV testing among women receiving post abortion care **Lado Wani Ismail, Zahida P. Qureshi and Shadrack B. Ojwang** ..... 101

Prevalence of primary Caesarean Section deliveries among primiparous and multiparous women at Iringa Regional Referral Hospital, Tanzania **Erick Augustino Mbunga, Ipyana Hudson Mwampagatwa and Alex Ibolinga Ernest** ..... 106

**MAIN ARTICLES**

Case Report: Huge inclusion cyst as a long term complication of female genital mutilation **Raymond Takpe, Oluwasomidoyin Olukemi Bello and Chinedum A.C Onebunne** ..... 109

Case Report: Ultra-Short Bowel Syndrome after a near-total small bowel resection for gangrene due to volvulus in a district hospital in South Sudan **Koma Akim** ..... 112

**SHORT ITEMS**

Quiz ..... 100

Erratum ..... 108

ICRC press release: Gunshot injuries remain high despite peace deal ..... 115

**BACK COVER**

CDC Poster: Is it Flu or Ebola ..... 116

**FRONT COVER IMAGE:**

Health workers using personal protective equipment (PPE) at a training during the Ebola outbreak in Guinea, 2014 (CDC/Lindsey Horton - Public Health Image Library ID# 18706)



# Ebola outbreak: a public health emergency of international concern

After nearly one year following the re-emergence of the Ebola Virus Disease (EVD) in the Democratic Republic of Congo (DRC), the World Health Organization (WHO) has declared the Ebola outbreak as a “public health emergency of international concern”.<sup>[1]</sup> This is only the fifth time in the history of the WHO that it has made such a declaration.

According to Dr Tedros Adhanom Ghebreyesus, WHO Director General, “it is time for the world to take notice and redouble our efforts. We need to work together in solidarity with the DRC to end this outbreak and build a better health system. We all owe it to these responders — coming from not just WHO but also government, partners and communities — to shoulder more of the burden.”

The threat of the EVD spreading in the region is real. It is the second largest outbreak in history following the West African epidemic of 2011 – 2016. Suspected cases have appeared in Uganda and other parts of the DRC outside the epidemic zones in North Kivu and Ituri regions.

The fear that the epidemic may spread to South Sudan is real. A recent suspected case in Juba Teaching Hospital, which was later confirmed not to be Ebola, had sent shock waves across the country.<sup>[2]</sup> Since last year, the Ministry of Health, working with the WHO and its partners, set up surveillance systems to prepare for and manage any outbreak in the country.<sup>[3]</sup> Raising the awareness about the potential of EVD spreading into South Sudan is important and it is everyone’s responsibility to be vigilant.

It is rare for WHO to declare an outbreak of a disease as a public health emergency of international concern. Four previous declarations were made. The first time was in 2009 for the outbreak of the H1N1 swine flu pandemic. The second was in May 2014 following the surge in polio cases that threatened the efforts towards eradication. The third in August 2014, came as the Ebola outbreak in West Africa was growing out of control. And the fourth was related to Zika in 2016.<sup>[4]</sup>

By declaring the emergency, WHO is putting everyone on notice for what could be a potentially catastrophic outbreak.

We have been warned.

## References

1. World Health Organization, [Press Release - Ebola outbreak in the Democratic Republic of the Congo declared a Public Health Emergency of International Concern](#), WHO, Geneva, 19 July 2019
2. Eye radio News - [‘She doesn’t have Ebola virus’](#) July 2019
3. Richard Lako and Otim Patrick, [Ebola on our doorstep: Ebola Virus Disease preparedness in South Sudan](#), South Sudan Medical Journal, 2018, 11(4)
4. Vox, [The WHO finally declared a public health emergency over Ebola](#), 17 July 2019.

**Dr Edward Eremugo Kenyi**

Editor-in-Chief  
South Sudan Medical Journal

Email:  
[admin@southernssudanmedicaljournal](mailto:admin@southernssudanmedicaljournal)

# Prevalence, clinical pattern and immediate outcomes of HIV-infected children admitted to Al Sabah Children's Hospital, South Sudan

Gawar Gel<sup>a</sup>, Sabrina B Kitaka<sup>b</sup>,  
Victor Musiime<sup>c</sup> and Hassan  
Chollong<sup>d</sup>

a Paediatrician, Al Sabah Children's Hospital,  
Juba, South Sudan

b Senior Lecturer, Makerere University, Uganda

c Senior Lecturer, Makerere University,  
Uganda; Senior Research Consultant, Joint  
Clinical Research Centre, Kampala, Uganda.

d Senior Paediatrician, Juba University, South  
Sudan

Correspondence:

Gawar Isaac Daian Gel  
[gawarisaac10@gmail.com](mailto:gawarisaac10@gmail.com)

Submitted: March 2019

Accepted: June 2019

Published: August 2019

**Introduction:** HIV continues to be a major global health issue. There were approximately 2.1 million infected children aged <15 years in 2017 and most were in sub-Saharan Africa. South Sudan with its low prevention of mother to child transmission (PMTCT) coverage has a greater risk of high transmission rates of HIV from mothers to their children.

**Objective:** To determine the prevalence of HIV infection, the clinical pattern, and the immediate outcomes of children admitted to Al Sabah Children's Hospital.

**Method:** This was a cross sectional descriptive study, with a longitudinal component for the immediate outcome. A total of 828 children were recruited: 424 aged <18 months and 424 aged ≥ 18 months. HIV rapid tests were done to confirm the HIV infection for children aged ≥18 months, while HIV DNA-PCR was done to confirm the HIV infection for children aged <18 months found to be HIV exposed.

**Results:** Twenty four children tested HIV positive giving an overall HIV prevalence of 2.8% (95% CI 1.8 – 4.2). The clinical characteristics associated with HIV infection were: a history of cough (p=0.001), weight loss (p <0.001), oral thrush (p <0.001), lymphadenopathy (p=0.001), ear discharge (p <0.001), skin lesion (p <0.001), hepatomegaly (p <0.001), and splenomegaly (p <0.01). Factors associated with prolonged hospital stay were history of weight loss (OR=4.96, 95% CI 2.68-9.18), skin lesions (OR=3.60, 95% CI 1.36-9.56), and weight for height/length z score <-3SD (OR=8.67, 95% CI 4.70-15.99).

**Conclusion:** The prevalence of HIV among this hospital based population of children aged less than 15 years was 2.8%. Children who presented with cough, weight loss, oral thrush, lymphadenopathy, ear discharge, skin lesion, hepatomegaly, and splenomegaly in this setting were likely to have HIV infection and should therefore raise suspicion for testing and early diagnosis.

**Key words:** HIV infection, clinical characteristics, children, hospital stay, South Sudan

## INTRODUCTION

According to UNAIDS, approximately 36.7 million people were living with HIV globally in 2017, of which 2.1 million were children aged under 15 years. <sup>[1]</sup> Most HIV-infected African children are never tested for HIV, although some symptoms such as non-specific generalized dermatitis, ear discharge, lobar pneumonia, and tuberculosis are associated with HIV. <sup>[2]</sup> The prevalence of HIV for hospitalized children in Africa has ranged between (10%-12.5%). <sup>[3, 4, 5, 6]</sup>

South Sudan has a very low 'Prevention mother to child transmission' (PMTCT) coverage. Only 29% of HIV positive pregnant women in 2016 received antiretroviral (ARVs) treatment, even though the country's circumstances favour increase in transmission rates due to low preventive programmes; displacement, increased commercial sex activities <sup>[7]</sup>, stigma and negative attitude to HIV infection and HIV infected mothers.

### Citation:

Gawar et al, Prevalence, clinical pattern and immediate outcomes of HIV-infected children admitted to Al Sabah Children's Hospital, South Sudan. South Sudan Medical Journal 2019; 12(3):85-88

© 2019 The Author (s)

### License:

This is an open access article under  
[CC BY-NC-ND](https://creativecommons.org/licenses/by-nc-nd/4.0/)

## OBJECTIVE

This study aimed to determine the prevalence of HIV infection, the clinical pattern of the illnesses, and the immediate outcomes of the admitted children in Al Sabah Children's Hospital in Juba, South Sudan between January and April 2018.

## METHOD

This was a cross sectional descriptive study, with a longitudinal component for the immediate outcomes. Consecutive enrolment of two cohorts of eligible children aged 0-14 years (424 aged under 18 months and 424 aged 18 months or over), admitted to Al Sabah Children's Hospital during the study period was done after obtaining informed consent from the mother/guardian.

DNA-PCR was done to confirm HIV infection in children aged <18 months and found to be HIV exposed, while HIV rapid testing was used for children aged ≥18 months. The clinical patterns and the short term outcome within seven days of close follow up were documented.

A questionnaire was used to obtain information on the socio-demographic characteristics and use of PMTCT services by their mothers. The main primary outcome was the prevalence of HIV among in-patient children. Data were entered into Epidata version 3.1, exported and analysed using Stata version 12 (Stata Corporation, Houston, Texas). For the continuous variables, mean and median were used to summarize the data, while proportions / percentages were used to describe categorical data. Ethical and administrative approvals were obtained from Makerere University, Uganda, Ministry of Health, South Sudan, and Al Sabah Children Hospital.

## RESULTS

The ages of the enrolled children ranged from 0 to 14 years; 52.2% were male and 47.8% were female. Most had been delivered by spontaneous vaginal delivery (n=779; 91.9%), and most had been exclusively breast fed for 4-6 months (n=706; 83.3%). Only 15 (1.8%) children were reported to have a sibling infected with HIV, whereas 555 (65.4%) did not have a sibling who had been tested for HIV.

The median age for the mother/guardian was 25 (22-30) years; 611(72.1%) were housewives and 753 (88.8 %) were married. Table 1 gives their other characteristics.

Twenty four children tested HIV positive giving a prevalence of 2.8% (95% CI 1.8 – 4.2). The WHO clinical stages for the 24 HIV infected children revealed that four were at stage 1, six at stage 2, eleven at stage 3 and three at stage 4. Six of these children (25%) had already been diagnosed with HIV infection, of whom five were enrolled in treatment prior to this study. Table 2 gives details of these 24 children and their mothers.

**Table 1. Characteristics of 848 mothers/guardians**

| Characteristics                   | Categories (n=848) | n (%)     |
|-----------------------------------|--------------------|-----------|
| <b>Education Level</b>            | Uneducated         | 339(39.9) |
|                                   | Primary            | 321(37.9) |
|                                   | Secondary          | 141(16.6) |
|                                   | Tertiary           | 44(5.2)   |
|                                   | Missing            | 3(0.4)    |
| <b>ANC Visits</b>                 | None               | 1(0.1)    |
|                                   | 1-2                | 206(24.3) |
|                                   | 3-4                | 641(75.6) |
| <b>HIV Status</b>                 | Positive           | 22(2.6)   |
|                                   | Negative           | 763(90.0) |
|                                   | Not tested         | 63(7.4)   |
| <b>Taking ARVs</b>                | Yes                | 18(81.8)  |
|                                   | No                 | 4(18.2)   |
| <b>Duration on ARVs in months</b> | Median             | 12(5-20)  |

**Table 2. Characteristics of HIV infected children**

| Characteristics               | HIV Positive: (n=24) | %    | 95%CI    |
|-------------------------------|----------------------|------|----------|
| <b>Overall</b>                | 24/848               | 2.8  | 1.8-4.2  |
| <b>Age in months</b>          |                      |      |          |
| ≥18                           | 15/424               | 3.5  | 1.9-5.8  |
| <18                           | 9/424                | 2.1  | 0.9-4.0  |
| <b>HIV status of mother</b>   |                      |      |          |
| Positive                      | 13/22                | 59.1 | 31.4-100 |
| Negative                      | 10/763               | 1.3  | 0.6-2.4  |
| Not tested                    | 1/63                 | 1.6  | 0.04-8.8 |
| <b>Mother taking ARVs</b>     |                      |      |          |
| Yes                           | 11/13                | 84.6 | 42.2-100 |
| No                            | 2/13                 | 15.4 | 1.9-55.6 |
| <b>Breast feeding history</b> |                      |      |          |
| Exclusive 4-6 months          | 19/706               | 27   | 1.6-4.2  |
| Mixed feeding                 | 5/140                | 3.6  | 1.2-8.3  |
| Not breast fed at all         | 0/2                  | 0    | 0        |

**Table 3. Clinical pattern of illness in HIV infected and uninfected children and presenting symptoms**

| Clinical presentation                         | HIV Status      |                  | P value |
|---|-----------------|------------------|---------|
|   | Positive (n=24) | Negative (n=824) |         |
| <b>History of cough</b>                       |                 |                  |         |
| Yes   | 23(95.8)        | 543(65.9)        | <0.001  |
| No  | 1(4.2)          | 281(34.1)        |         |
| <b>Duration of cough in weeks</b>             |                 |                  |         |
| < 2   | 15(62.5)        | 469(56.91)       |         |
| =/>2  | 8(33.3)         | 74(8.9)          |         |
| <b>History of fever</b>                       |                 |                  |         |
| Yes   | 20(83.3)        | 744(90.3)        | 0.29    |
| No  | 4(16.6)         | 80(9.7)          |         |
| <b>Duration of fever in weeks</b>             |                 |                  |         |
| <1  | 6(25)           | 352(42.7)        |         |
| 1   | 9(37.5)         | 348(42.2)        |         |
| 2   | 4(16.6)         | 35(4.2)          |         |
| 2+  | 1(4.2)          | 9(1)             |         |
| Missing                                       |                 |                  |         |
| <b>History of diarrhoea</b>                   |                 |                  |         |
| Yes   | 11(45.8)        | 488(59.3)        | 0.19    |
| No  | 13(54.1)        | 336(40.7)        |         |
| <b>Duration of diarrhoea in weeks</b>         |                 |                  |         |
| <2  | 9(37.5)         | 463(56.1)        |         |
| =/>2  | 2(8.3)          | 25(3)            |         |
| <b>History of weight loss</b>                 |                 |                  |         |
| Yes   | 17(70.9)        | 235(28.6)        | <0.001  |
| No  | 7(29.1)         | 589(71.4)        |         |
| <b>Loss of consciousness</b>                  |                 |                  |         |
| Yes   | 0(0)            | 53(6.5)          | 0.39    |
| No  | 24(100)         | 771(93.5)        |         |
| <b>History of convulsions</b>                 |                 |                  |         |
| Yes   | 4(16.6)         | 123(15)          | 0.77    |
| No  | 20(83.3)        | 701(85)          |         |
| <b>Weight for height/length Z score (WHZ)</b> |                 |                  |         |
| Normal (>-1)                                  | 8(33.3)         | 595(72.2)        | <0.001  |
| Mild (<-1, >-2)                               | 1(4.1)          | 48(5.8)          |         |
| Moderate (<-2, >-3)                           | 3(12.5)         | 40(4.8)          |         |
| Severe Malnutrition (<-3)                     | 12(50%)         | 141(17.1)        |         |

Children diagnosed with HIV infection had a variety of clinical presentations: most were underweight ( $p < 0.001$ ) and stunted ( $p < 0.001$ ) (Table 3).

Table 3 shows that the clinical characteristics with significant associations with HIV infection were: a history of cough ( $p = 0.001$ ), weight loss ( $p < 0.001$ ). We also found a significant association with oral thrush ( $p < 0.001$ ), lymphadenopathy ( $p = 0.001$ ), ear discharge ( $p < 0.001$ ), skin lesion ( $p < 0.001$ ), hepatomegaly ( $p < 0.001$ ), splenomegaly ( $p < 0.01$ ).

Out of the 24 HIV infected children, 12 (50%) stayed at the hospital for more than 1 week and 12 (50%) for  $\leq 7$  days ( $p < 0.001$ ). One child died (4.2%) within the one week of the follow-up period. Factors associated with prolonged hospital stay were history of weight loss (OR=4.96, 95% CI 2.68-9.18), skin lesions (OR=3.60, 95% CI 1.36-9.56), and weight for height/length z-score  $< -3$  SD (OR=8.67, 95% CI 4.70-15.99).

Among children diagnosed with HIV, 11 (45.8%) were admitted with severe acute malnutrition, 10 (41.6%) were diagnosed with diarrheal diseases, 9 (37.5%) with malaria and 8 (33.3%) had pneumonia. The least diagnoses which have been made in this population of HIV infected children were bacteraemia, severe anaemia, sickle cell anaemia, osteomyelitis, and tuberculosis.

In children who were not infected with HIV, 456 (55.3%) were diagnosed with malaria, 218 (26.4%) with septicaemia/bacteraemia, 218 (26.4%) with pneumonia, 216 (26.2%) had diarrheal diseases, 80 (9.7%) with severe acute malnutrition and 40 (4.8%) with severe anaemia. The least diagnoses which were made in the HIV negative population are heart diseases, urinary tract infection, sickle cell anaemia, asthma, epilepsy and others.

## DISCUSSION

The prevalence of HIV infection was 2.8 %. This is low compared to other studies in East, West and South Africa in in-patient settings, where the prevalence ranges between 10% and 12.5%.<sup>[3,4,5,6]</sup> Despite this, the low prevalence of HIV infection in our study must be viewed with caution as the current risks for HIV transmission are still very high.<sup>[8,9]</sup>

The implication of this result should lead to the shifting of resources toward prevention and elimination of HIV transmission.

In our study 11 out of 13 (84.6%) mothers who were on ARVs had children infected with HIV. This indicates inadequate and under-utilized PMTCT services. This picture is supported by other data from South Sudan which showed that only 7.3% of

infants born to HIV-positive women had been HIV tested within two months of birth.<sup>[10]</sup> This poor uptake will lead to an increase in mother to child transmission. The early diagnosis and utilization of PMTCT in nearby countries e.g. Kenya and Uganda, is much better compared to South Sudan.<sup>[11, 12]</sup> Therefore improved completion rates of PMTCT are necessary to reduce vertical HIV transmission.<sup>[13,14]</sup>

The clinical pattern in our study compares well with other studies in Africa.<sup>[3, 4, 5, 6]</sup> Most of our children infected with HIV were at WHO clinical stage 3.

Other studies have reported higher rates of deaths in the HIV in-patient population compared to our study.<sup>[15]</sup> The reason for our lower rate may be attributed to the shorter period of follow-up.

## CONCLUSION

The prevalence of HIV in our hospitalized children was 2.8% being lower than that reported from elsewhere. Expanding access to early detection of infant HIV infection in South Sudan should aid in the HIV care for infants, and contribute to the 'Elimination of mother to child transmission' (EMTCT)/PMTCT) programme.

The clinical characteristics associated with HIV infection compared to HIV negative children were: a history of cough, weight loss, oral thrush, lymphadenopathy, ear discharge, skin lesion, hepatomegaly, and splenomegaly. These should raise suspicion of HIV infection and the need for HIV testing.

## Acknowledgements

We thank the staff at Al Sabah Children's Hospital, Dr Charles Kiyaga at the Central Public Health Laboratory, Uganda, Prof. James Tumwine of Makerere University, Gordon Memorial Trust Fund and SURVIVAL PLUS project for financial and other logistical support.

## References

1. Joint United Nations Programme on HIV/AIDS (UNAIDS). UNAIDS Data 2017. [www.unaids.org/en/resources/documents/2017/2017\\_data\\_book](http://www.unaids.org/en/resources/documents/2017/2017_data_book).
2. Gisselquist D, Potterat JJ, Brody S. Review article: HIV transmission during paediatric health care in sub-Saharan Africa-risks and evidence: original article. *South African Medical Journal*. 2004; 94(2):109-16.
3. Rabie H, de Boer A, van den Bos S, et al. Children with human immunodeficiency virus infection admitted to a paediatric intensive care unit in South Africa 2007. 270-3 p
4. Wanyenze RK, Nawavvu C, Ouma J, Namale A, et al. Provider-initiated HIV testing for paediatric inpatients and their caretakers is feasible and acceptable. *Tropical Medicine & International Health*. 2010;15(1):113-9.
5. Leyenaar JK, Novosad PM, Ferrer KT, et al. Early clinical outcomes in children enrolled in human immunodeficiency virus infection care and treatment in Lesotho. *The Pediatric Infectious Disease Journal*. 2010;29(4):340-5.
6. Ogunbosi BO, Oladokun RE, Brown BJ, et al. Prevalence and clinical pattern of paediatric HIV infection at the University College Hospital, Ibadan, Nigeria: a prospective cross-sectional study. *Italian Journal of Pediatrics*. 2011; 37(1):29.
7. UNHCR. South Sudan Crises risk of reversal of HIV gains time to act now. . December 2013. Available on [www.unhcr.org/52c6c1159.pdf](http://www.unhcr.org/52c6c1159.pdf). Retrieved on May 30th, 2017.
8. Mohamed BA, A Mahfouz, Mohamed Salih. Factors associated with HIV/AIDS in Sudan. *BioMed research international*. 2013; 2314-6133.
9. UNAIDS. SOUTH SUDAN UNAIDS. 2017. [www.unaids.org/en/regionscountries/countries/southsudan](http://www.unaids.org/en/regionscountries/countries/southsudan).
10. Sudan RoS. South Sudan AIDS Commission and Ministry of Health June 2015. Unpublished.
11. Uganda TRo The HIV and AIDS Uganda Country Progress Report 2014. 15th June, 2015. [www.unaids.org/sites/default/files/country/.../UGA\\_narrative\\_report\\_2015.pdf](http://www.unaids.org/sites/default/files/country/.../UGA_narrative_report_2015.pdf).
12. Council NAC. Kenya AIDS Response Progress Report 2014- progress towards Zero, March 2014. [www.unaids.org/sites/default/files/country/.../KEN\\_narrative\\_report\\_2014.pdf](http://www.unaids.org/sites/default/files/country/.../KEN_narrative_report_2014.pdf).
13. Dionne-Odom J, Welty TK, Westfall AO, et al. Factors associated with PMTCT cascade completion in four African Countries. *AIDS research and treatment*. 2016; 2016.
14. Johnson LF. The contribution of maternal HIV seroconversion during late pregnancy and breastfeeding to mother-to-child transmission of HIV. 2012;59(4):417-25.
15. Kabue MM, Buck WC, Wanless SR, Cox CM, et al. Mortality and clinical outcomes in HIV-infected children on antiretroviral therapy in Malawi, Lesotho, and Swaziland. *Pediatrics*. 2012; 130(3):e591-e9.



# The effects of maternal Body Mass Index on placental morphology and foetal birth weight: a study from Dodoma Central Region, Tanzania

Elly O. Kiliopa<sup>a</sup>, Peter Ainory Gesase<sup>b</sup> and Athanase Lilungulu<sup>c</sup>

<sup>a</sup> College of Health Science, School of Nursing and Public Health, The University of Dodoma, Dodoma, Tanzania.

<sup>b</sup> Department of Anatomy, College of Health Sciences, The University of Dodoma, Dodoma, Tanzania

<sup>c</sup> Department of Obstetrics and Gynaecology, College of Health Sciences, The University of Dodoma, Dodoma, Tanzania.

Correspondence:

Elly O. Kiliopa  
ellyok54@yahoo.com

Submitted: January 2019

Accepted: April 2019

Published: August 2019

**Introduction:** The placenta plays a pivotal role during pregnancy by being intimately connected to the mother and foetus.

**Objective:** To determine the effects of maternal Body Mass Index (BMI) on placental morphology and foetal birth weight.

**Method:** The placental samples were obtained with consent from 236 mothers with a singleton full term pregnancy and who had a live birth between January 2017 and June 2018. Statistics on maternal BMI, placental morphology and foetal birth weight were collected and analysed using SPSS version 20 for Window (SPSS Inc., Chicago, IL, USA).

**Results:** The mean maternal BMI was  $24.25 \pm 131.605$  and was positively correlated with the foetal birth weight ( $r=0.66$ ;  $p<0.001$ ), number of cotyledons ( $r=0.71$ ,  $p<0.001$ ), placental weight ( $r=0.50$ ;  $p <0.001$ ) and placental thickness ( $r=0.42$ ;  $p<0.001$ ).

**Conclusion:** The study supports the hypothesis that maternal factors which are known to influence foetal growth, birth weight and neonatal body composition are also the determinants of the placental morphology. Therefore, all the parameters can be clinically used in the prediction of birth outcome

**Key words:** placenta, morphology, birth weight, maternal BMI, Tanzania

## INTRODUCTION

The wellbeing of the foetus is influenced by a number of factors<sup>[1]</sup> including maternal characteristics, the placenta and umbilical cord morphology and functions.<sup>[2]</sup>

The placenta is a fantastic organ yet often neglected due to its transient existence; it performs functions that are later taken on by separate organs, including the lungs, liver, gut, kidneys and endocrine glands.<sup>[3]</sup> It is the interface between mother and foetus and influences maternal and newborn mortality.<sup>[4]</sup>

Careful examination of the placenta can shed light on the in-utero environment of the foetus<sup>[5, 6]</sup> and can help to explain an abnormal neonatal outcome and might have consequences for treatment.<sup>[8,7]</sup> It might identify a risk of recurrence resulting in preventive measures during subsequent pregnancies.<sup>[8]</sup> However, there is evidence that the quality of the investigations of the placenta is very variable.<sup>[7]</sup>

## OBJECTIVE

To determine the effects of maternal (BMI) on placental morphology and foetal birth weight.

## METHOD

Gravid mothers at full term admitted to the labour wards of Dodoma Regional Referral Hospital, Chamwino District Hospital and Makole Urban Health Centre, for spontaneous vertex delivery were selected through simple random sampling. With the mothers' consent the freshly delivered placentas were examined consecutively until the sample size of 236 was achieved. The mothers were weighed prior to delivery (with 12 kg deducted to give pre-pregnancy

## Citation:

Kiliopa et al, The effects of maternal Body Mass Index on placental morphology and foetal birth weight: a study from Dodoma Central Region, Tanzania. South Sudan Medical Journal 2019; 12(3):89-92

© 2019 The Author (s)

## License:

This is an open access article under  
[CC BY-NC-ND](#)

**Table 1. The demographics and clinical characteristics of the mothers (n=236)**

| Characteristics            | n (%)      |
|----------------------------|------------|
| <b>Age years</b>           |            |
| 18-24                      | 136 (57.6) |
| 25-31                      | 56 (23.7)  |
| 32-38                      | 34 (14.4)  |
| 39 and above               | 10 (4.3)   |
| <b>Parity</b>              |            |
| Primipara                  | 117 (49.6) |
| Multipara                  | 119 (50.4) |
| <b>Gestation age weeks</b> |            |
| 37-39                      | 155 (65.7) |
| 40-42                      | 81 (34.3)  |
| <b>BMI</b>                 |            |
| <18.5=Underweight          | 20 (8.5)   |
| 18.5-24.9=Normal           | 208 (88.1) |
| 25.0-29.9=Overweight       | 8 (3.4)    |

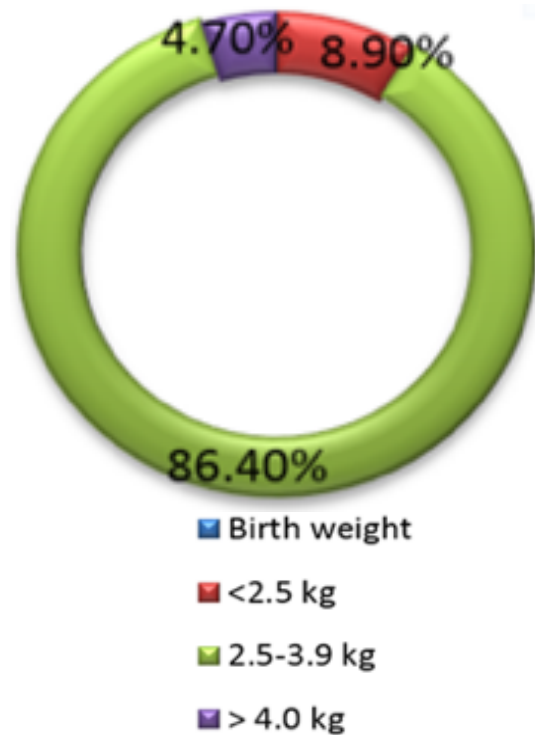


Figure 1. Neonatal birth weights

**Table 2. Chi-square analysis of the maternal BMI versus morphology of the placenta and foetal birth weight.**

| Placental morphology            | BMI             |                   |                | Chi-Square      |         |
|---------------------------------|-----------------|-------------------|----------------|-----------------|---------|
|                                 | Underweight n % | Normal weight n % | Overweight n % | Chi-Square test | p-value |
| <b>Weight of placenta g</b>     |                 |                   |                |                 |         |
| <400                            | 16 (61.5%)      | 10 (38.5%)        | 0 (0.0%)       | 112.017a        | 0.001   |
| 400-700                         | 3 (1.5%)        | 187 (95.4%)       | 6 (3.1%)       |                 |         |
| ≥701                            | 1 (7.1%)        | 11 (78.6%)        | 2 (14.3%)      |                 |         |
| <b>No. of cotyledons</b>        |                 |                   |                |                 |         |
| <15 (few cotyledons)            | 16 (88.9)       | 2 (11.1%)         | 0 (0.0%)       | 162.466a        | 0.001   |
| 15-25(normal no. of cotyledons) | 4 (1.8%)        | 206 (94.5%)       | 8 (3.7%)       |                 |         |
| <b>Placental thickness</b>      |                 |                   |                |                 |         |
| <2.0 cm (thin)                  | 9 (56.2%)       | 7 (43.8%)         | 0 (0.0%)       | 58.859a         | 0.001   |
| 2.0-4.0 cm (normal)             | 11 (5.1%)       | 199 (91.7%)       | 7 (3.2%)       |                 |         |
| ≥4.1cm (thick)                  | 0 (0.0%)        | 2 (66.7%)         | 1 (33.3%)      |                 |         |
| <b>Diameter of the placenta</b> |                 |                   |                |                 |         |
| 11-22 cm (normal)               | 20 (8.8%)       | 201 (88.2%)       | 7 (3.1%)       | 2.730a          | 0.255   |
| ≥23 cm (large)                  | 0 (0.0%)        | 7 (87.5%)         | 1 (12.5%)      |                 |         |
| <b>Cord length</b>              |                 |                   |                |                 |         |
| <31cm (short)                   | 0 (0.0%)        | 3 (100.0%)        | 0 (0.0%)       | 2.717a          | 0.606   |
| 32-70 cm (normal)               | 19 (9.3%)       | 178 (86.8%)       | 8 (3.9%)       |                 |         |
| >70 cm (long)                   | 1 (3.6%)        | 27 (96.4%)        | 0 (0.0%)       |                 |         |

| <b>Cord diameter</b>            |            |             |           |          |       |
|---------------------------------|------------|-------------|-----------|----------|-------|
| <1 cm (thin)                    | 0 (0.0%)   | 1 (100.0%)  | 0 (0.0%)  | 0.829a   | 0.935 |
| 1-2 cm (normal)                 | 20 (8.7%)  | 202 (87.8%) | 8 (3.5%)  |          |       |
| >2 cm (thick)                   | 0 (0.0%)   | 5 (100.0%)  | 0 (0.0%)  |          |       |
| <b>No. of umbilical vessels</b> |            |             |           |          |       |
| 2 vessels (SUA)                 | 0 (0.0%)   | 6 (100.0%)  | 0 (0.0%)  | 0.829a   | 0.661 |
| 3 vessels (normal)              | 20 (8.7%)  | 202 (87.8%) | 8 (3.5%)  |          |       |
| <b>Cord around the neck</b>     |            |             |           |          |       |
| Yes                             | 1 (2.3%)   | 43 (97.7%)  | 0 (0.0%)  | 4.853a   | 0.088 |
| No                              | 19 (9.9%)  | 165 (85.9%) | 8 (4.2%)  |          |       |
| <b>Cord entanglement</b>        |            |             |           |          |       |
| Yes                             | 0 (0.0%)   | 16 (94.1%)  | 1 (5.9%)  | 1.963a   | 0.375 |
| No                              | 20 (9.1%)  | 192 (87.7%) | 7 (3.2%)  |          |       |
| <b>Cord insertion</b>           |            |             |           |          |       |
| Centric                         | 0 (0.0%)   | 5 (100.0%)  | 0 (0.0%)  | 3.430a   | 0.489 |
| Eccentric                       | 20 (9.4%)  | 185 (86.9%) | 8 (3.8%)  |          |       |
| Marginal                        | 0 (0.0%)   | 18 (100.0%) | 0 (0.0%)  |          |       |
| <b>Newborn weight</b>           |            |             |           |          |       |
| <2.5 kg (underweight)           | 17 (81.0%) | 4 (19.0%)   | 0 (0.0%)  | 175.792a | 0.001 |
| 2.5-3.9 kg (normal weight)      | 3 (1.5%)   | 196 (96.1%) | 5 (2.5%)  |          |       |
| ≥4.0 kg (big baby)              | 0 (0.0%)   | 8 (72.7%)   | 3 (27.3%) |          |       |

weights) and their BMIs calculated.

The nurse-midwife who delivered the placenta gave it to the researcher who cleaned off the blood using running tap water. The placenta was put in a plastic bag and weighed, using a scale which recorded to 0.01 kg, after the umbilical cord was cut 3 cm from the neonate (after the cord had been measured). Cord length was considered short when < 32 cm and long when > 70 cm.

Data management and analysis were performed using Statistical Package for Social Sciences (SPSS) version 20 and the results presented in frequency tables; bivariate analyses were conducted to determine the effects of maternal BMI on placental morphology and foetal birth weight.

## RESULTS

Table 1 shows the age, parity, gestation age and BMI of the mothers.

Twenty six (11%) of the placentas weigh <400g, and 14 (5.9%) weigh >701g. Most of the placentas 196 (83%) were of normal weight (400 - 700g); the range was 210-1000 g and the mean weight was  $524.24 \pm 131.605$  g.

Most (92.4%) of the placentas had a normal cotyledon count (15-25 cotyledons), the range was 12 – 25 cotyledons and the mean cotyledon count was  $19.61 \pm 2.895$ ; most

(96.8%) had the normal range of thickness of 2 – 4 cm with a mean of  $2.888 \pm 0.6472$  cm and most (96.6%) had a diameter in the normal range of 11 – 22 cm with a mean of  $16.86 \pm 2.359$  cm. Most (86.9%) umbilical cords had a normal length of 32 – 70cm with a mean of 57.102 and  $\pm 11.5739$  cm. Most (90.3%) had eccentric umbilical cord insertions in the chorionic plate.

Half (50.4%) of the 236 neonates were female and 49.6% were male. Figure 1 shows that the majority had a normal birth weight of 2.5 - 3.9 kg; the mean birth weight was  $3.051 \pm 0.051$ .

Table 2 shows that there was a significant association between maternal BMI and morphology of the placenta:

- Out of 26 low weight placentas (<400 grams), 61.5% were from underweight mothers ( $p < 0.001$ ).
- Among 16 placentas with a number of cotyledons below normal, 88.9% of them were from the mothers who were underweight ( $p < 0.001$ ).
- Out of 16 placentas less than 2.0cm, 56.2% were from underweight mothers ( $p < 0.001$ ).

The placental diameter, umbilical cord length, umbilical cord diameter, number of umbilical vessels, cord insertion and status of the cord did not show any association with the maternal BMI ( $p = 0.489$ ).

**Table 3. Relationship of maternal BMI versus placental morphology versus foetal birth weight**

| Variable 1         | Variable 2               | Pearson's r | P-value  |
|--------------------|--------------------------|-------------|----------|
| Body Mass Index vs | Foetal birth weight (kg) | 0.66*       | <0.001** |
|                    | Cotyledons count (n)     | 0.71*       | <0.001** |
|                    | Placental weight (g)     | 0.50*       | <0.001** |
|                    | Placental thickness (cm) | 0.42        | <0.001** |

There was a significant association between maternal BMI and birth weight since out of 21 babies who were underweight 17 (81.0%) were from underweight mothers ( $p < 0.001$ ).

The relationship between maternal BMI, placenta morphology and foetal birth weight was investigated using Pearson's correlation. Table 3 shows that maternal BMI was positively correlated with the foetal birth weight.

## DISCUSSION

In our study the mean placental weight was  $524 \pm 132$  g. We found a significant positive correlation between maternal BMI with placental weight (50%), and foetal birth weight (66%). This suggests that maternal underweight is an indication of low placental indices and this results in low foetal birth weight. Thus the results are compatible with the concept that some of the effects of BMI on foetal birth weight are mediated through the promotion of placental growth.

## CONCLUSION

The study supports the hypothesis that maternal factors which are known to influence foetal growth, birth weight and neonatal body composition are also the determinants of the placental morphology. Therefore, all the parameters can be clinically used in the prediction of birth outcome.

## RECOMMENDATIONS

Better understanding of the placenta is needed. Therefore, it is recommended that, midwives, doctors and delivery assistants should check the placenta to make sure it is complete because if some is missing the woman is in danger of bleeding or infection. If anything unusual is noticed it should be documented with measurements and photographs if possible. In places where there are sophisticated scans showing things like placental blood flow and growth of the foetus information gained allows more individual diagnosis and management of problems. Therefore the relevant authorities should encourage protocols and develop guides/checklists for placenta examination in health facilities.

## Acknowledgment

We thank the pregnant women who, despite being caught up in a realm of labour pains, agreed to participate in this study, the administrations of Dodoma Regional Referral Hospital, Chamwino District Hospital and Makole Urban Health Centre and all the health care providers who provided me with unconditional support.

## Competing interest

The authors declare that they have no competing interests.

## References

1. Madkar C, Musale J, Deshpande H. A Study Of Placental Weight And Birth Weight Ratio (Pw / Bw) And It ' S Effects On Perinatal Outcome, Indian Journal of Obstetrics and Gynecology 2(March), 1–6.
2. Bimpong S. Qualitative Evaluation of Umbilical Cord and Placental Indices and Pregnancy Outcome. Thesis. Kwame Nkrumah University Of Science & Technology, Kumasi 2012
3. Costa MA. The endocrine function of human placenta: An overview. Reproductive BioMedicine Online 2016; 32(1), 14–43. <https://doi.org/10.1016/j.rbmo.2015.10.005>
4. Burton G J, Fowden AL. The placenta: a multifaceted, transient organ. Philosophical Transactions of the Royal Society B: Biological Sciences 2015; 370(1663), 20140066–20140066. <https://doi.org/10.1098/rstb.2014.0066>
5. Higgins LE. (2015). Assessing And Quantifying Placental Dysfunction In Relation To Pregnancy Outcome In Pregnancies Complicated By Reduced Fetal Movements. Thesis Faculty of Medical and Human Sciences University of Manchester 2015
6. Panti A, Yakubu A, Ekele B, Nwobodo E. The relationship between the weight of the placenta and birth weight of the neonate in a Nigerian Hospital. Nigerian Medical Journal 2012; 53(2), 80. <https://doi.org/10.4103/0300-1652.103547>
7. Pathak S et al. Cord coiling, umbilical cord insertion and placental shape in an unselected cohort delivering at term: Relationship with common obstetric outcomes. Placenta 2010; 31(11), 963–968. <https://doi.org/10.1016/j.placenta.2010.08.004>
8. Senapati S, Nayak L, Behera SS, Chinara PK. Morphometric Study of Placenta of Full Term New Born & Its Relation To Fetal Weight: a Study in Tertiary Care Hospital of Odisha. Journal of Evolution of Medical and Dental Sciences-Jemds 2015; 4(5), 742–747. <https://doi.org/10.14260/jemds/2015/107>



# Multiple-drug resistant (MDR) tuberculosis among HIV sero-positive and sero-negative populations in Ilorin, North-Central Nigeria

Abubakar A. Abdulazeez<sup>a</sup>,  
Adeniran A. Margaret<sup>b</sup>, Nassar  
A. Sulaiman<sup>c</sup> and Abdulazeez I.  
Abdulazeez<sup>d</sup>

a Department of Medical Laboratory Science,  
University of Medical Sciences, Ondo- City,  
Nigeria.

b Department of Microbiology, Kwara State  
University, Malete- Ilorin Nigeria

c Department of Biomedical Sciences, Ladoke  
Akintola University, Osogbo, Nigeria.

d Department of Medical Laboratory Services,  
LAUTECH Teaching Hospital, Osogbo, Nigeria.

## Correspondence:

Abubakar Aderemi Abdulazeez [abuazeez1962@gmail.com](mailto:abuazeez1962@gmail.com)

Submitted: December 2018

Accepted: June 2019

Published: August 2019

## Citation:

Abdulazeez et al Multiple-drug resistant (MDR) tuberculosis among HIV sero-positive and sero-negative populations in Ilorin, North-Central Nigeria. South Sudan Medical Journal 2019; 12(3):93-96

© 2019 The Author (s)

## License:

This is an open access article under

[CC BY-NC-ND](https://creativecommons.org/licenses/by-nc-nd/4.0/)

**Introduction:** Multiple-drug resistant tuberculosis (MDR-Tb) has become a global issue especially in many African countries. Regular studies are needed to ascertain its early detection and elimination in the endemic regions in order to reduce the morbidity and mortality rates

**Objective:** To assess the frequency of MDR-Tb among HIV sero-positive and sero-negative populations in Ilorin, North-Central Nigeria.

**Method:** Sputum samples were collected from 1,601 subjects provisionally diagnosed with pulmonary tuberculosis (TB) at Sobi Specialist Hospital, Ilorin-Nigeria. Inclusion criteria were based on a cough for at least three weeks with no response to antibiotics treatment or when the chest Xray indicated TB infection. From each patient three specimens were obtained for Ziehl Neelsen staining and 4ml of blood were collected for HIV antibody testing.

**Results:** The frequency of Acid Fast Bacilli (AFB) positive cases was 10.86% while 0.72% MDR-Tb and 3.2% concurrent infection with *Mycobacterium tuberculosis* and HIV were documented. Statistically, no significant association between age and MDR-Tb ( $X^2=0.6731$ ,  $P>0.05$ ) was found.

**Conclusion:** The study revealed 10.86% of AFB positive cases, 0.74% MDR-Tb cases and 3.2% concurrent infection between *Mycobacterium tuberculosis* and HIV. We therefore recommend aggressive and effective control measures to prevent further transmission of MDR-Tb between patients and health care workers while increased access to ART for HIV infected MDR-TB patients is also suggested.

**Key words:** multiple-drug resistant tuberculosis, co-infection, HIV, Nigeria

## INTRODUCTION

Pulmonary tuberculosis (TB) is an infectious disease causing high morbidity and mortality throughout the world.<sup>[1-5]</sup> In 2015, reports showed an estimated 10.4 million cases of tuberculosis globally, including 1.2 million (11%) people living with Human Immunodeficiency Virus (HIV). Recent reports showed that 57% of TB among people living with HIV was not promptly diagnosed or treated, resulting in 390,000 tuberculosis-related deaths in 2015.<sup>[6, 7]</sup>

HIV infection increases the risk of TB infection<sup>[8, 9]</sup> by 26 to 36 times.<sup>[10, 11]</sup> TB causes about a third of HIV-related deaths.<sup>[4, 6]</sup> *Mycobacterium tuberculosis* is defined as multidrug-resistant when it becomes resistant to first-line drugs as isoniazid and rifampin. This accounts for 5% of all TB cases globally.<sup>[12, 13]</sup> The World Health Organization (WHO) endorsed the Gene Xpert MTB/RIF for use in countries where TB is endemic and declared it a major milestone for global TB diagnosis in December 2010.<sup>[14]</sup>

In view of paucity of information about MDR-Tb in our locality, this study was carried out to determine the frequency among HIV sero-positive and sero-negative populations

## METHOD

### Selection of subjects and specimen collection

The study was carried out between June 2017 and May 2018 in the chest clinic

of the Specialist Hospital Ilorin, north -central Nigeria on sputum collected from 1,610 patients provisionally diagnosed with pulmonary TB. Ethical approval was obtained from Ethical and Animal Care Committee of the School of Basic Medical Sciences, Kwara State University. Informed consent of the subjects and the parents of children was obtained.

A cross-sectional simple random method was employed. Inclusion criteria were based on a cough for at least three weeks with no response to antibiotics or when the chest Xray indicated TB infection.

Three specimens were obtained per subject. The first specimen was produced on the first contact, the second produced early morning following the first day at home while the third was produced at the clinic. Four milliliters of blood were collected from each subject for HIV antibody testing.

#### Laboratory analysis of specimens.

Each sputum specimen was treated with a mixture of sodium hypochlorite and sodium hydroxide for decontamination before analysis. Smears were made from the sediment of the specimens and stained by Ziehl Neelsen techniques and examined for Acid-Fast Bacilli.

Assessment for multiple drug resistance was based on the use of the Gene Xpert machine which is an automatic sputum processor by real time amplification. The process was repeated for all the specimens and only the concordant results were considered in this study.

Commercial Determine test strip (Global source, Shenyang LTH Tech, China) was employed for qualitative detection of HIV antibodies. Each test strip was removed from the foil, dipped in the serum for 30 seconds and allowed for 5 minutes on the work bench for the serum to flow through control and test columns. Appearance of two pinkish lines in the strip within 5 minutes was an indication of HIV positive while appearance of a single line at the control column was an indication of negative HIV serum.

#### Statistical analysis

Data were analyzed using SPSS version 23 software

(SPSS Inc. USA). The Chi Square test was used to assess the distribution of MDR-Tb and the frequency of co-infection between AFB and HIV infection.

#### RESULTS

Frequency of Multiple Drug Resistance and co-infection of AFB and HIV with respect to age is shown in Table 1. Out of 1,610 subjects examined, no case of MDR-Tb was reported among age groups of 15-29 years and 30-44 years while 1.10% and 8.0% MDR tuberculosis were documented in age groups of 45-59 years and 60 years and above respectively. Chi-Square test showed no significant association between age and MDR-Tb ( $\chi^2=0.6731$ ,  $P>0.05$ ). The highest rate (4.2%) of concurrent infection was reported within the age group 30-44 years while no case of co-infection was recorded among those aged 60-72 years. Statistically significant positive correlation was recorded between co-infection (of AFB and HIV) and age ( $r = 4.9210$ ,  $P<0.05$ ).

Figure 1 shows that a higher rate of TB was recorded among the male subjects ( $n=98$ , 6.1%) than among females ( $n=75$ , 4.7 %). Conversely, a higher rate of HIV infection was recorded for females ( $n=36$ , 2.2 %) than the males ( $n=28$ , 1.7 %). Our findings also revealed a higher rate (3.45%) of co-infection among females than in males with 3.10%. Out of 175 AFB positive cases recorded, 47 of them were also infected with HIV representing 26.90% of the AFB positive cases.

Figure 2 shows the frequency of MDR-Tb in relation to HIV status. Out of 62 subjects tested positive for AFB with unknown HIV Status, six (9.6%) were MDR. Also, out of 63 HIV sero-positive cases living with TB, 6 (9.5%) were MDR resistant while no case of MDR was recorded among 50 HIV sero-negative subjects with tuberculosis.

Occurrence of co-infection of AFB and HIV with respect to marital status is as shown in Table 2. The results showed no case of co-infection among the widows whereas 2.98% and 0.90% of the co-infections were documented among single and married subjects respectively. Chi-square test showed no significant difference in the rate of co-infection with respect to marital status ( $\chi^2=0.9337$ ,  $P>0.05$ ).

**Table 1. Frequency of Multiple Drug Resistance and co-infection of AFB and HIV according to age**

| Age – years | Number examined | AFB positive n (%) | MDR n (%) | HIV positive only n (%) | AFB + HIV Co-infection n (%) |
|-------------|-----------------|--------------------|-----------|-------------------------|------------------------------|
| 15-29       | 575             | 64 (11.13)         | 0(0.0)    | 28(4.9)                 | 20 (3.4)                     |
| 30-44       | 571             | 83(14.53)          | 0(0.0)    | 27(4.7)                 | 24(4.2)                      |
| 45-59       | 364             | 20(5.49 )          | 4(1.10)   | 4(1.10)                 | 8(2.2)                       |
| 60-74       | 100             | 8 (8.00)           | 8(8.00)   | 4(4.0)                  | 0( 0.00)                     |
| Total       | 1610            | 175 (10.86)        | 12(0.72)  | 63(3.91)                | 52(3.2)                      |

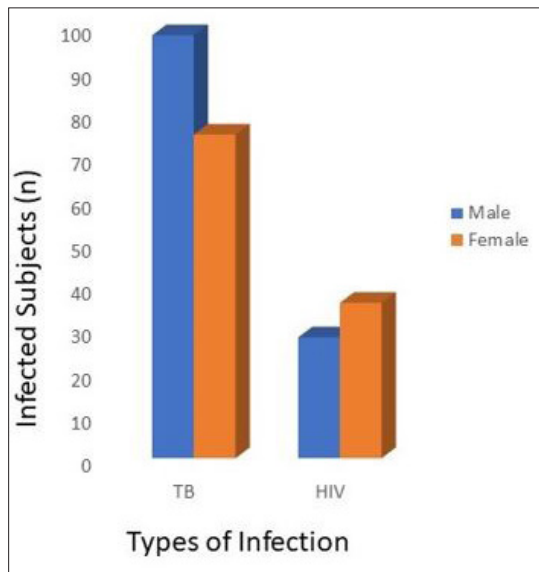


Figure 1. Distribution of AFB and HIV by gender

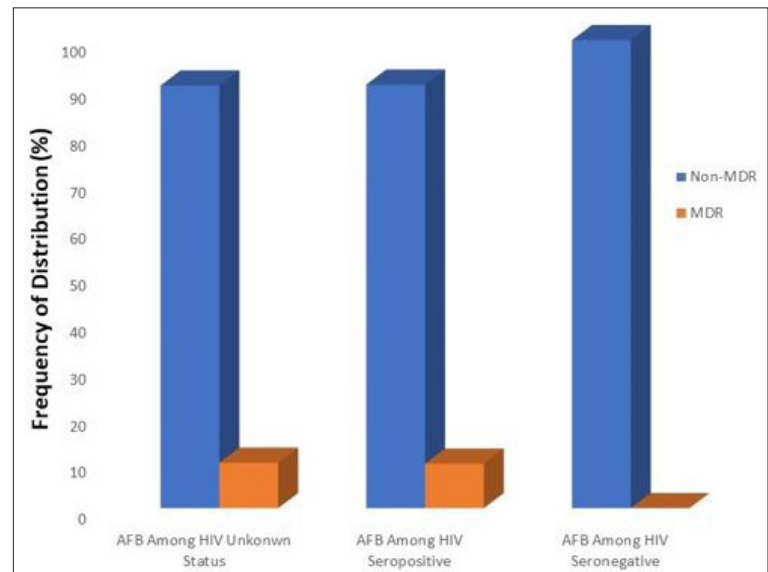


Figure 2. Prevalence of MDR tuberculosis in relation to HIV status

Table 2. Concurrent infection of AFB and HIV in relation to marital status.

| Marital Status | No examined | AFB positive n (%) | HIV positive n (%) | AFB + HIV Co-infection n (%) |
|----------------|-------------|--------------------|--------------------|------------------------------|
| Single         | 436         | 43 (9.86)          | 20 ( 4.58)         | 13 (2.98)                    |
| Married        | 1035        | 132 (14.00)        | 43(4.15)           | 10 (0.90)                    |
| Widow/Divorced | 139         | 0 ( 0.00)          | 0 (0.00)           | 0 (0.00)                     |
| <b>Total</b>   | <b>1610</b> | <b>175 (10.86)</b> | <b>63 ( 3.91)</b>  | <b>23 (1.43)</b>             |

## DISCUSSION

This study reveals 0.74% prevalence rate of MDR-Tb while 3.2% of co-infection with *Mycobacterium tuberculosis* and HIV was documented. The frequency of AFB positive cases was 10.86%. This finding differs from the result of a previous study<sup>[15]</sup> in which a 22% prevalence rate was found in the south-eastern part of the same country. Our sample size was larger and may explain this difference. Out of the 175 AFB positive cases recorded, only 12 cases were MDR positive representing 4.0 % of the AFB positive cases and 0.74% of the entire sampled population. Coincidentally, all the cases of MDR were documented among the HIV sero-positive population while none was reported among their sero-negative counterparts. The finding is similar to a previous WHO report.<sup>[5]</sup>

The MDR result in the present study is however at variance with the 3.6% reported by Okorie et al.<sup>[15]</sup> The difference could be attributed to the automated machine employed in this study while a manual technique was used by the previous authors. This requires further investigation.

Assessing the frequency of AFB positive cases with respect to age, the highest rate (14.53%) was recorded within the

age group 30-44 years, implying that this age group was more vulnerable to *Mycobacterium tuberculosis* infection. However, there was no record of MDR-Tb among this age group whereas 8.0% was recorded among subjects of 60 years and above. The reason for higher MDR among the older age group may be attributed to lower immunity with advancing age. Our finding differs from a previous study [8] where the highest rate was reported within the age of 50 years and above. Chi-Square test showed no significant association between age and MDR-Tb ( $X^2=0.6731$ ,  $P>0.05$ ) and between gender and MDR-Tb, ( $X^2 = 0.912$ ,  $P>0.05$ ).

Our study showed no case of co-infection with HIV and AFB among the widows while 2.98% and 0.90% co-infection was documented among the single and married subjects respectively. The reason for this could probably be due to a lower exposure by the widows to both infections as against single and married subjects. Also, non-uniformity of the specimens collected in the present study could probably be the cause of the variation.

Statistically, our findings showed a positive correlation between AFB and HIV prevalence in relation to age ( $r = 4.9210$ ,  $P < 0.05$ ). This observation implies that with

the rate of Mycobacterium tuberculosis infection, the frequency of HIV in the study area may be predicted in a model investigation.

## CONCLUSION

This study revealed 10.86% of AFB positive cases, 0.74% MDR-Tb and 3.2% concurrent infection between Mycobacterium tuberculosis and HIV. We therefore recommend aggressive and effective control measures to prevent further transmission of MDR-Tb between patients and health care workers while increased access to ART for HIV infected MDR-TB patients is also suggested. Further studies that may lead to the discovery of new molecular markers are germane for prompt diagnosis and control of MDR-Tb.

## References

- Cox HS, Kalon S, Allamuratova S, Sizaire V, Tigay ZN. Multidrug-resistant tuberculosis treatment outcomes in Karakalpakstan, Uzbekistan: treatment complexity and XDR-TB among treatment failures. *PLoS One* 2007; 2: e1126. Table 4. <https://doi.org/10.1371/journal.pone.0001126.t004>
- Gupta R, Kim JY, Espinal MA, Caudron JM, Pecoul B. Public health. Responding to market failures in tuberculosis control. *Science* 2001; 293:1049–1051. [www.sciencemag.org/DOI:10.1126/science.1061861](http://www.sciencemag.org/DOI:10.1126/science.1061861)
- Resch SC, Salomon JA, Murray M, Weinstein MC. Cost-effectiveness of treating multidrug-resistant tuberculosis. *PLoS Med* 2006; 3: e241. <https://doi.org/10.1371/journal.pmed.003024>
- Mukadi YD, Maher D, Harries A. Tuberculosis case fatality rates in high HIV prevalence populations in sub-Saharan Africa. *AIDS* 2001; 15:143–152. <https://www.ncbi.nlm.nih.gov/pubmed/11216921>
- World Health Organization. Anti-tuberculosis drug resistance in the world: Fourth global report. Geneva. 2008. <https://www.who.int/tb/publications/tb-drugresistance-fourthreport/en/>
- United Nation Program on AIDS (UNAIDS). Global HIV and AIDS statistics fact sheets, 2018. <http://www.unaids.org/en/resources/fact-sheet>
- World Health Organization. Fact sheet: HIV treatment and care: what's new in infant diagnosis. WHO, 2015 <http://apps.who.int/iris/handle/10665/204346>
- Raviglione MC, Narain JP, Kochi A. HIV-associated tuberculosis in developing countries: clinical features, diagnosis, and treatment. *Bulletin of the World Health Organization*. 1992; 70(4):515. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2393393/>
- Friedland G. Tuberculosis, drug resistance, and HIV/AIDS: a triple threat. *Curr Infect Dis Rep* 2007; 9: 252–261. <https://www.ncbi.nlm.nih.gov/pubmed/17430708>
- World Health Organization Global HIV statistics Fact sheets, 2016 <https://www.who.int/hiv/data/en/>
- Kelly P, Burnham G, Radford C. HIV seropositivity and tuberculosis in a rural Malawi hospital. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 1990; 84(5):725-7. <https://www.ncbi.nlm.nih.gov/pubmed/2278084>
- Brust JC, Gandhi NR, Carrara H, Osburn G, Padayatchi N. High treatment failure and default rates for patients with multidrug-resistant tuberculosis in KwaZulu-Natal, South Africa, 2000-2003. *Int J Tuberc Lung Dis* 2010; 14:413–419. <https://www.ncbi.nlm.nih.gov/pubmed/20202298>
- World Health Organization. Tuberculosis MDR-TB & XDR-TB: The Geneva Report, 2008 [https://www.who.int/tb/publications/2007/mdr\\_xdr\\_global\\_response\\_plan.pdf](https://www.who.int/tb/publications/2007/mdr_xdr_global_response_plan.pdf)
- Ejilude AM, Paul A, Oluwadun A. Primary multi-drug resistant tuberculosis among HIV seropositive and seronegative patients in Abeokuta, South-western Nigeria. *America J Research Communication* 2013; 1(10): 224-237 <https://www.semanticscholar.org/paper/Primary-Multi-drug-Resistant-Tuberculosis-among-Hiv>
- Okorie O, John A, Gidado M, Akang G, Emperor U, Rupert E, Vivian I, Meribole E, Osakwe P. The prevalence of drug-resistant tuberculosis among people living with HIV (PLHIV) in Abia State. *Advances in Infectious Diseases*. 2016; 6 (2):63-67. <https://www.scirp.org/journal/PaperInformation.aspx?PaperID=67504>



# Prevalence of chronic rhinosinusitis at Muhimbili National Hospital, Dar es Salaam

Zephania Saitabau Abraham<sup>a</sup>,  
Rafael Gabriel<sup>b</sup>, Aveline Aloyce  
Kahinga<sup>c</sup>, Daudi Ntunaguzi<sup>c</sup>,  
Kassim Babu Mapondella<sup>c</sup> and  
Enica Richard Massawe<sup>c</sup>

a Department of Surgery, University of Dodoma-  
College of Health and Allied Sciences, Dodoma-  
Tanzania

b Department of Otorhinolaryngology-Mbeya  
Zonal Referral Hospital, Mbeya Tanzania

c Department of Otorhinolaryngology-Muhimbili  
University of Health and Allied Sciences, Dar es  
Salaam-Tanzania.

## Correspondence:

Zephania Saitabau  
[zsaitabau@yahoo.com](mailto:zsaitabau@yahoo.com)

Submitted: January 2019

Accepted: April 2019

Published: August 2019

## Citation:

Abraham et al. Prevalence of chronic  
rhinosinusitis at Muhimbili National Hospital,  
Dar es Salaam. South Sudan Medical Journal  
2019; 12(3):97-100

© 2019 The Author (s)

## License:

This is an open access article under  
[CC BY-NC-ND](https://creativecommons.org/licenses/by-nc-nd/4.0/)

**Introduction:** Chronic rhinosinusitis (CRS) affects people of all ages worldwide and has significant socio-economic impact. Data on chronic rhinosinusitis are scarce.

**Objective:** To determine the prevalence of CRS among patients attending the Otorhinolaryngology Department at Muhimbili National Hospital (MNH).

**Method:** This was a hospital based descriptive cross-sectional study where 56 patients with CRS were recruited from July to December 2015 after meeting the criteria set by American Academy of Otorhinolaryngology Head and Neck Surgery (AAO-HNS). Data were analysed using SPSS program version 21.

**Results:** The prevalence of CRS among 5321 patients was 1.07%; 51.8% were female and the highest proportion was aged 11-20 years. Bilaterality of disease was found in 62%. The maxillary sinus (83.9%) was the most affected sinus whilst the sphenoid sinus was least affected. There was good correlation between computerized tomography (CT) and intraoperative findings, anatomical variations and pathological features.

**Conclusion:** CRS appears to be less prevalent at MNH than elsewhere with a tendency to bilaterality and maxillary sinus predominance similar to other studies.

**Keywords:** Prevalence, chronic rhinosinusitis, Muhimbili Hospital, Tanzania

## INTRODUCTION

Chronic rhinosinusitis (CRS) has a significant impact on the quality of life. The recurrent nature of the problem presents a clinical and economic challenge in developing countries.

A number of studies have been carried out to assess the prevalence of CRS. A survey in USA estimated that about 16% of the population was affected by CRS.<sup>[1]</sup> In a Sao Paulo (Brazil) study, CRS was found in 5.51%.<sup>[2,3]</sup> A Nigerian study found a prevalence of CRS of 7.3%.<sup>[4]</sup> In North-central Nigeria, a higher prevalence was reported at 24.7% similar to reports from Canada and USA<sup>[5-8]</sup> The maxillary sinuses have been reported in most studies as the sites predominantly affected by CRS.<sup>[8]</sup>

Data on this condition in sub-Saharan Africa are scarce and no study has been done in Tanzania.

## METHOD

A hospital based descriptive cross sectional study, with the approval of the Research and Publication Committee of the Muhimbili University of Health and Allied Sciences, was conducted between July and December 2015. Participants were recruited on the basis of those who were found at the hospital. Those with CRS and underlying neoplasms were excluded to create comparability with other studies. Computerized tomography (CT) scan was obtained and the clinical diagnosis of CRS was made based on the presence of at least two major symptoms for at least twelve weeks consecutively as per the Task Force of American Academy of Otorhinolaryngology, Head and Neck Surgery (AAO-HNS).

**Table 1. Age and sex distribution of participants**

| Age group (years) | Sex         |             | Total n(%)  |
|-------------------|-------------|-------------|-------------|
|                   | Males n (%) | Female n(%) |             |
| ≤10               | 937 (51.9)  | 870 (48.1)  | 1807 (34.0) |
| 11-20             | 279 (48.7)  | 293 (51.3)  | 573 (10.8)  |
| 21-30             | 318 (40.1)  | 475 (59.9)  | 793 (14.9)  |
| 31-40             | 274 (42.2)  | 375 (57.8)  | 649 (12.2)  |
| 41-50             | 290 (46.5)  | 334 (53.5)  | 624 (11.7)  |
| 51-60             | 229 (43.1)  | 303 (56.9)  | 532 (10.0)  |
| >60               | 170 (49.4)  | 174 (50.6)  | 344 (6.5)   |
| Total             | 2497 (46.9) | 2824 (53.1) | 5321 (100)  |

**Table 2. Proportion of patients with chronic rhinosinusitis by age**

| Age group (years) | Chronic rhinosinusitis |             | Total n(%) |
|-------------------|------------------------|-------------|------------|
|                   | Yes n (%)              | No n(%)     |            |
| ≤10               | 1 (0.1)                | 1806 (99.9) | 1807(34.0) |
| 11-20             | 17 (3.0)               | 555 (97.0)  | 572 (10.7) |
| 21-30             | 4 (0.5)                | 789 (99.5)  | 793(14.9)  |
| 31-40             | 10 (1.5)               | 639 (98.5)  | 649(12.2)  |
| 41-50             | 11 (1.8)               | 613 (98.2)  | 624(11.7)  |
| 51-60             | 7 (1.3)                | 525 (98.7)  | 532 (10.0) |
| >60               | 6 (1.7)                | 338 (98.2)  | 344 (6.5)  |
| Total             | 56 (1.1)               | 5265(98.9)  | 5321 (100) |

**Table 3. Distribution of clinical features of chronic rhinosinusitis by sex**

| Clinical Presentation   | Sex        |              | Total n (%) |
|-------------------------|------------|--------------|-------------|
|                         | Male n (%) | Female n (%) |             |
| Nasal obstruction       | 27 (48.2%) | 28 (50.9%)   | 55 (98.2%)  |
| Nasal discharge         | 27 (48.2%) | 27 (48.2%)   | 54 (96.4%)  |
| Post nasal discharge    | 23 (41.1%) | 28 (50.0%)   | 51 (92.1%)  |
| Reduced smell sensation | 24 (42.9%) | 25 (44.6%)   | 49 (87.5%)  |
| Facial pain             | 17 (30.4%) | 22 (39.3%)   | 39 (69.6%)  |
| Fatigue                 | 15 (26.8%) | 15 (26.8%)   | 30 (53.4%)  |
| Halitosis               | 9 (16.1%)  | 9 (16.1%)    | 18 (32.2%)  |
| Headache                | 9 (16.1%)  | 8 (14.3%)    | 17 (30.4%)  |
| Dental pain             | 4 (7.1%)   | 5 (8.9%)     | 9 (16.1%)   |
| Ear pain                | 2 (3.6%)   | 5 (8.9%)     | 7 (12.5%)   |

Nasal endoscopy was done on all 5321 patients and 56 had CRS. Pre-operative findings were compared with intra-operative findings during endoscopic or open surgery. Data were analyzed using SPSS version 21. The relationship between variables was established using Chi-square test and logistic linear regression. The level of agreement between scanning CT scanning and intra-operative findings was determined by calculating kappa statistics, sensitivity and specificity.

## RESULTS

### Demographic characteristics of study participants

This study involved 5321 patients: 2824 (53.1%) were females. The largest (34.0%) age group was ≤10 years while the smallest (6.5%) group was >60 years. The mean age was 25.5 years (Table 1).

The highest proportion (3.0%) of CRS was found in age group 11-20 years whilst the group ≤10 years had the lowest prevalence (0.06%) ( $p < 0.0001$ ) (Table 2).

Proportions of chronic rhinosinusitis by sex ( $p = 0.603$ ): Of the 56 patients with CRS 29 (51.8%) were female and 27 (48.2%) were male.

### Clinical features of chronic rhinosinusitis by sex

The most common presenting symptom was nasal obstruction 55 (98.2%) whilst the least common was ear pain 7(12.5%) ( $p < 0.05$ ) (Table 3).

Almost two-thirds of patients had bilaterality (62.5%). The right side was affected more often than the left (Table 4). There was almost an equal sex distribution of the side involved.

The maxillary sinus was the most commonly affected sinus group (83.9%) while the sphenoid sinus was the least involved group (30.4%) (Figure 1).

CT scan was very sensitive and specific in picking up concha bullosa, followed by septal deviation, and hypertrophied inferior turbinate with sensitivity 83.3% and 95.6 % respectively. Correlation Coefficient  $r = 0.95$ , t-test for significance coefficient is 8.390. ( $R^2 = 90.5\%$ ) (Table 5).

Among 32 patients with homogenous opacification, 16 had pus or mucus intraoperatively and 14 had polyposis.

## DISCUSSION

CRS is a significant health problem with a rising prevalence worldwide (2-15%). Data for Tanzania are unknown. This study revealed the prevalence in patients attending our department to be 1.07 % similar to the study from Korea (1.1%) 10 although dissimilar to other community based studies with higher prevalences.<sup>[4,11,12]</sup>

Variability in age distribution of CRS was found similar to other studies.<sup>[6]</sup> Findings from this study demonstrated

**Table 5. The comparison between pre-operative CT scan and intra-operative findings**

| Finding                       | FESS Positive |         |    | FESS Negative |         |    | Se   | Sp   | NPV  | PPV  |
|-------------------------------|---------------|---------|----|---------------|---------|----|------|------|------|------|
|                               | CT + ve       | CT - ve | n  | CT + ve       | CT - ve | n  |      |      |      |      |
| Mucosal thickening            | 8             | 10      | 18 | 4             | 22      | 26 | 44.4 | 84.6 | 68.7 | 66.6 |
| Fungal balls                  | 14            | 2       | 16 | 1             | 27      | 28 | 87.5 | 96.4 | 93.1 | 93.3 |
| Septal Deviation              | 5             | 1       | 06 | 2             | 36      | 38 | 83.3 | 94.7 | 97.3 | 71.4 |
| Hypertrophied Inferior Concha | 22            | 1       | 23 | 1             | 20      | 21 | 95.6 | 95.2 | 95.2 | 95.7 |
| Concha Bullosa                | 12            | 0       | 12 | 0             | 32      | 32 | 100  | 100  | 100  | 100  |
| Blocked Osteomeatal complex   | 14            | 12      | 26 | 3             | 15      | 18 | 53.8 | 83.3 | 82.3 | 55.6 |

(Abbreviations for this table: Se: Sensitivity, Sp: Specificity, NPV: Negative predictive value, PPV: Positive predictive value, CT: Computerized tomography, FESS: Functional Endoscopic Sinus Surgery)

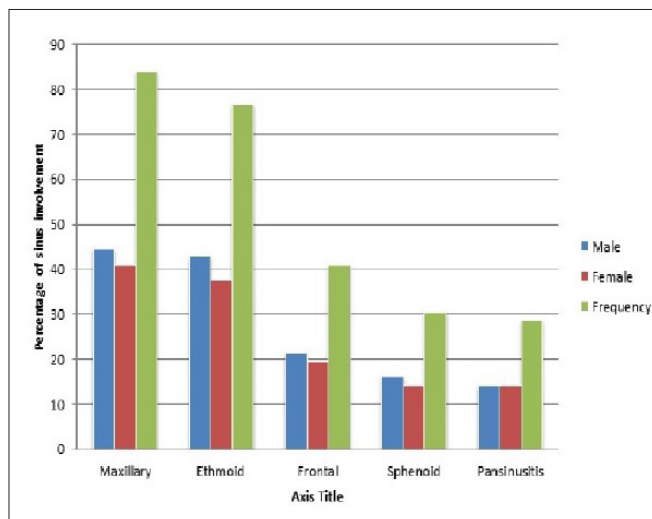


Figure 1. Involvement of various sinus groups demonstrated by CT scan by sex

the prevalence of CRS to be similar to other community based studies<sup>[13,14]</sup> though dissimilar to findings from western countries which were also community based.<sup>[1,5,6,15]</sup> The controversy may be due to differences in the perception of CRS-related symptoms and lifestyles in different settings.

The most common features were nasal obstruction in 55(98.2%), nasal discharge in 54(96.4%), post nasal discharge in 51(92.1%), reduced smell sensation 48(85.7%) similar to other studies [5,8,11,12]. Most patients had bilateral disease with the right side being more affected in unilateral disease. The maxillary sinus was most affected and the sphenoid sinus the least. Similar findings were reported in other studies.<sup>[4,5,8,11,12]</sup>

Perhaps an expected finding was that CT scans were sensitive in demonstrating the paranasal sinus pathologies with significant sensitivity and specificity similar to other studies.<sup>[8]</sup>

## CONCLUSION

CRS has an overall prevalence of 1.1% in our setting being less than found elsewhere. The disease has a male preponderance and CT scanning has shown usefulness but added little to endoscopic evaluation. Thus the study has unveiled useful information on CRS in Tanzania.

**Acknowledgements:** We thank members of staff from our Department for their valuable inputs.

**Competing interests:** We declare we have no competing interests.

## References

1. Pleis JR, Ward BW, Lucas JW. Summary health statistics for US adults: National Health Interview Survey, 2009. Vital and health statistics. Series 10, Data from the National Health Survey. 2010 Dec(249):1-207.
2. Pilan RR, Pinna FD, Bezerra TF, Mori RL, Padua FG, Bento RF, Perez-Novo C, Bachert C, Voegels RL. Prevalence of chronic rhinosinusitis in Sao Paulo. *Rhinology*. 2012 Jun;50(2):129-38.
3. Slavin RG, Spector SL, Bernstein IL, Kaliner MA, Kennedy DW et al; American Academy of Allergy, Asthma and Immunology; American College of Allergy, Asthma and Immunology; Joint Council of Allergy, Asthma and Immunology: The diagnosis and management of sinusitis: a practice parameter update. *J Allergy Clin Immunol* 2005, 116(6 Suppl):S13-S47.
4. Iseh KR, Makusidi M. Rhinosinusitis: a retrospective analysis of clinical pattern and outcome in north western Nigeria. *Annals of African medicine*. 2010;9(1).
5. Adoga AA, Ma'an ND. The Epidemiology and Economic Impact of Rhinosinusitis in Jos, North Central Nigeria.

6. Chen Y, Dales R, Lin M. The epidemiology of chronic rhinosinusitis in Canadians. *The Laryngoscope*. 2003 Jul;113(7):1199-205.
7. Jarvis D, Newson R, Lotyall D, Hastan D et al; Asthma in adults and its association with CRS: the GA2LEN survey in Europe. *Allergy* 2012, 67(1):91-98
8. Amodu EJ, Fasanla AJ, Akano AO, Olusesi AD. Chronic rhinosinusitis: correlation of symptoms with computed tomography scan findings. *Pan African Medical Journal*. 2014;18(1).
9. Li C, Musich PR, Ha T, Ferguson DA, Patel NR, Chi DS, Thomas E. High prevalence of *Helicobacter pylori* in saliva demonstrated by a novel PCR assay. *Journal of clinical pathology*. 1995 Jul 1;48(7):662-6.
10. Fokkens W, Lund V, Mullol J. European position paper on rhinosinusitis and nasal polyps 2007. *Rhinology*. Supplement. 2007;20:1-36.
11. Pilan RR, Pinna FR, Bezerra TF, Mori RL, Padua FG, Bento RF, Perez-Novo C, Bachert C, Voegels RL; Prevalence of chronic rhinosinusitis in Sao Paulo. *Rhinology* 2012,50(2):129-138
12. Shi JB, Fu QL, Zhang H, Cheng L, Wang YJ, Zhu DD, Lv W, Liu SX, Li PZ, Ou CQ, Xu G. Epidemiology of chronic rhinosinusitis: results from a cross-sectional survey in seven Chinese cities. *Allergy*. 2015 May;70(5):533-9.
13. Fokkens W, Lund V, Mullol J; European position paper on rhinosinusitis and nasal polyps 2007. *Rhinology* 2007, 20:1-136
14. Kim YS, Kim NH, Seong SY, Kim KR, Lee GB, Kim KS. Prevalence and risk factors of chronic rhinosinusitis in Korea. *American journal of Rhinology & Allergy*. 2011 May; 25(3):e117-21.
15. Hastan DF, Fokkens WJ, Bachert C, Newson RB, Bislumovska J, Bockelbrink A, Bousquet PJ, Brozek G, Bruno A, Dahlén SE, Forsberg B. Chronic rhinosinusitis in Europe—an underestimated disease. A GA2LEN study. *Allergy*. 2011 Sep;66(9):1216-23.

## QUIZ

### Dodoma, Tanzania CS paper:

1. What were the main indications for primary Caesarean Section?
2. What was the prevalence of primary Caesarean Section?

### Dar es Salaam CRS paper:

3. Which nasal sinuses are most commonly affected by chronic rhinosinusitis (CRS)?
4. What was the prevalence of CRS reported?
5. What were the four main presenting features of CRS?

### Nigerian MDR paper:

6. What virus affecting immunity is associated with TB?
7. Which age group was reported with the highest incidence of TB multiple drug resistance?

### Dodoma, Tanzania maternal BMI paper:

8. Name three factors listed in this paper that affect foetal health.
9. What characteristics of the placenta seem to be related to low maternal BMI?
10. Does the placenta have an endocrine function?

See answers on page 115



# The acceptability of HIV testing among women receiving post abortion care

Lado Wani Ismail, Zahida P. Qureshi and Shadrack B. Ojwang

Department of Obstetrics and Gynaecology,  
University of Nairobi, Kenya

## Correspondence:

Lado Wani Ismail [ladowani85@gmail.com](mailto:ladowani85@gmail.com)

Submitted: February 2019

Accepted: July 2019

Published: August 2019

**Introduction:** In South Sudan few women have heard about the HIV. The prevalence of HIV infection in the country is 2.6%. Post abortion care (PAC) accounts for over 50% of all gynaecological admissions at the Juba Teaching Hospital (JTH). HIV testing is not routinely offered as part of PAC services.

**Objective:** To determine factors associated with acceptability of HIV testing among women receiving PAC at JTH.

**Methods:** This was a cross-sectional study, conducted at the Gynaecological Unit of JTH. Three hundred and forty patients were interviewed using a structured questionnaire.

**Results:** The mean age of the participants was 24.7 years with 50.5% aged <25 years, 31.5% were employed, and 31.8% had no formal education. Acceptability of HIV testing was 70.9% and the prevalence of HIV was 2.7%. The most common reason for not accepting, was the belief, based on previous results, that they were HIV negative. Patients aged  $\geq 25$  years and those with primary and secondary education were twice as likely to accept HIV testing than those <25 years and those with no formal education, respectively. Employment status, religion and marital status were not statistically associated with acceptability of HIV testing. Patients previously tested for HIV were more likely to accept testing.

**Conclusion:** Routine HIV testing should be integrated into PAC services with efforts to increase awareness of HIV and importance of testing

**Key words:** HIV, abortion, post-abortion care, South Sudan

## INTRODUCTION

South Sudan has a relatively low prevalence of HIV/AIDS at about 2.6%, with pockets of concentration in specific geographic zones.<sup>[1]</sup> The government's effort in combating the disease has been hampered by ignorance about HIV, with 45% of women aged 15-49 years having no knowledge of the virus. Most feared taking the test and said it is a death sentence.<sup>[2,3]</sup>

Political instability has caused the displacement of people, with most living in camps where the risk of HIV infection is thought to be high.<sup>[4]</sup> Limited access to services due to poor infrastructure and inadequate human resources are challenges holding back the fight against HIV. Only about 13% of pregnant women living with HIV have access to PMTCT. AIDS related deaths have almost doubled (6,900 to 13,000) between 2001 and 2012, and it is still on the rise in association with ongoing conflicts and displacement of populations.<sup>[4]</sup>

Women are disproportionately affected by the HIV epidemic in sub-Saharan Africa as a result of social and economic inequality. In 2012, about 59% of those living with HIV were female. Women often face discrimination in terms of access to education, employment, and health care. The man is often the decision maker in a relationship, and as a result, women cannot always negotiate for safer sex practices with high risk partners. Gender based violence has also been identified as a major player when it comes to HIV transmission.<sup>[5]</sup> The post abortion care (PAC) recommended by United States Agency for International Development (USAID) has three components: emergency

## Citation:

Ismail et al, The acceptability of HIV testing among women receiving post abortion care, South Sudan Medical Journal 2019; 12(3):101-105

© 2019 The Author (s)

## License:

This is an open access article under

[CC BY-NC-ND](https://creativecommons.org/licenses/by-nc-nd/4.0/)

treatment, counselling on family planning (including services such as evaluating and treatment of sexually transmitted infections and HIV testing and counselling), and community empowerment through community awareness and mobilization.<sup>[6]</sup> However, routine HIV testing and counselling is not practiced as part of PAC services in South Sudan.

This study was designed to determine the factors associated with the acceptability of HIV testing among women receiving PAC services in JTH, specifically to determine the socio- demographic characteristics

## METHOD

This cross-sectional study was carried out at the Gynaecological unit (December 2015 to January 2016). Three hundred and forty patients were recruited by consecutive sampling having had abortions up to 20 weeks gestation. Severely ill patients were excluded. The sample size was determined using Fisher's formula for prevalence taking an estimate of 67.6% as expected proportion of patients accepting HIV testing.<sup>[7]</sup>

Approval to conduct the study was obtained from the Kenyatta National Hospital/University of Nairobi Ethics and Research Committee through the Department of Obstetrics and Gynaecology at the University of Nairobi. Permission was also obtained from the Research Committee at the Ministry of Health, South Sudan. Informed, written consents were obtained from all participants or their careers.

Information was collected by confidential interviews after the patients had received treatment of abortion. Patients accepting a HIV test were given pre- and post-test counselling. Results were disclosed and the interview concluded. Patients with positive results were counselled and initiated on anti-retrovirus treatment (ARVs).

The dependent variable was calculated as proportion of those who accepted testing. Comparison between categorical variables were done using Chi square test. To identify factors associated with acceptability, the dependent variable was cross tabulated with each socio-demographic characteristic, health seeking, and reproductive health attributes. Factors found significantly associated with HIV testing were included in multivariate logistic regression model to identify independent predictors of acceptability. All analyses were performed with SPSS version 21. A two-sided P-value of <0.05 was considered statistically significant.

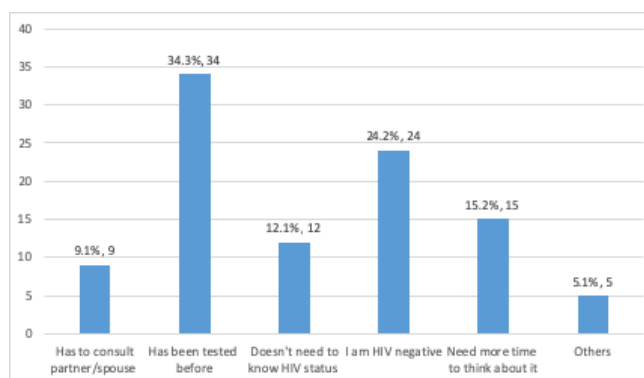
## RESULTS

The demographic characteristics of the women are shown in Table 1.

Among the 340 women, 241 (70.9%) accepted HIV testing and 2.7% were positive. The reasons for not

**Table 1. Demographic characteristics of women who received PAC**

| Characteristic                   | n %        |
|----------------------------------|------------|
| <b>Age year</b>                  |            |
| 15 – 19                          | 60 (17.6)  |
| 20 – 24                          | 112 (32.9) |
| 25 – 29                          | 107 (31.5) |
| 30 – 34                          | 41 (12.1)  |
| 35 – 39                          | 17 (5.0)   |
| 40 – 45                          | 2 (0.6)    |
| 45 and above                     | 1 (0.3)    |
| <b>Marital status</b>            |            |
| Single                           | 40 (11.8)  |
| Married                          | 293 (86.2) |
| Divorced / Separated             | 7 (2.1)    |
| <b>Level of formal education</b> |            |
| None                             | 108 (31.8) |
| Primary                          | 123 (36.2) |
| Secondary                        | 85 (25.0)  |
| College / University             | 24 (7.1)   |
| <b>Currently employed</b>        |            |
| Yes                              | 107 (31.3) |
| No                               | 233 (68.5) |
| <b>Religion</b>                  |            |
| Christian                        | 302 (88.8) |
| Muslim                           | 34 (10.0)  |
| Others                           | 4 (1.2)    |



**Figure 1. Reasons for declining HIV testing among women receiving post abortion care at JTH.**

accepting testing are displayed in Figure 1. Table 2 displays the bivariate analysis of the socio-demographic factors associated with acceptance of HIV testing.

Acceptance increased with age: those over 35 years were 4.9 times more likely to accept testing than those under 20 years. Acceptability also increased with level of education. Women having university education were three times more likely to accept testing in comparison to women with no formal education.

**Table 2. Bivariate analysis of Socio-demographic characteristics associated with acceptance of HIV testing**

| Characteristic                   | Accepted testing   |                  | OR (95% CI)      | P value |
|----------------------------------|--------------------|------------------|------------------|---------|
|                                  | Yes<br>n = 241 (%) | No<br>n = 99 (%) |                  |         |
| <b>Age (year)</b>                |                    |                  |                  |         |
| 15-19                            | 32(13.3)           | 28(28.3)         | 1.0              |         |
| 20-24                            | 79(32.8)           | 33(33.3)         | 2.09(1.09-4.01)  | 0.026   |
| 25-29                            | 79(32.8)           | 28(28.3)         | 2.47(1.27-4.80)  | 0.008   |
| 30-34                            | 34(14.1)           | 7(7.1)           | 4.25(1.63-11.08) | 0.003   |
| ≥35                              | 17(7.1)            | 3(3.0)           | 4.96(1.31-18.71) | 0.018   |
| <b>Age (years)</b>               |                    |                  |                  |         |
| <25                              | 111(46.1)          | 61(61.6)         | 1.0(ref)         |         |
| ≥25                              | 130(53.9)          | 38(38.4)         | 1.9 (1.2-3.0)    | 0.009   |
| <b>Marital status</b>            |                    |                  |                  |         |
| Single                           | 26(10.8)           | 14(14.1)         | 1.0              |         |
| Married                          | 212(88.0)          | 81(81.8)         | 1.41(0.70-2.83)  | 0.336   |
| Divorced / Separated             | 3(1.2)             | 4(4.0)           | 0.40(0.08-2.07)  | 0.276   |
| <b>Level of formal education</b> |                    |                  |                  |         |
| None                             | 65(27.0)           | 43(43.3)         | 1.0              |         |
| Primary                          | 93(38.6)           | 30(30.3)         | 2.05(1.17-3.60)  | 0.013   |
| Secondary                        | 63(26.1)           | 22(22.1)         | 1.89(1.02-3.52)  | 0.043   |
| College / University             | 20(8.3)            | 4(4.0)           | 3.31(1.06-10.35) | 0.040   |
| <b>Currently employed</b>        |                    |                  |                  |         |
| Yes                              | 82(34.0)           | 25(25.3)         | 1.0              |         |
| No                               | 159(66.0)          | 74(74.7)         | 0.66(0.39-1.11)  | 0.115   |
| <b>Religion</b>                  |                    |                  |                  |         |
| Christian                        | 216(89.6)          | 86(86.9)         | 1.0              |         |
| Muslim                           | 21(8.7)            | 13(13.1)         | 0.64(0.31-1.34)  | 0.240   |
| Others                           | 4(1.7)             | 0(0.0)           | NA               |         |
| <b>Previous HIV testing</b>      |                    |                  |                  |         |
| Yes                              | 193 (80.1)         | 69 (69.7)        | 1.74(0.98-3.07)  | 0.033   |
| No                               | 48 (19.9)          | 30 (30.3)        | 1.0(ref)         |         |

**Table 3. Bivariate analysis of reproductive health history of women receiving PAC who accepted HIV testing and those who did not accept testing**

| Characteristic               | Accepted testing   |                  | OR (95% CI)     | P value |
|------------------------------|--------------------|------------------|-----------------|---------|
|                              | Yes<br>n = 241 (%) | No<br>n = 99 (%) |                 |         |
| <b>Number of abortions</b>   |                    |                  |                 |         |
| 1                            | 201(83.4)          | 84(84.8)         | 1.0(ref)        |         |
| 2                            | 23(9.5)            | 11(11.1)         | 0.87(0.41-1.87) | 0.729   |
| More than 2                  | 17(7.1)            | 4(4.0)           | 1.78(0.58-5.44) | 0.314   |
| <b>Period of amenorrhoea</b> |                    |                  |                 |         |
| Less than 8 weeks            | 41(17.0)           | 21(21.2)         | 1.0(ref)        |         |
| Between 8-12 weeks           | 104(43.2)          | 40(40.4)         | 1.33(0.70-2.53) | 0.38    |
| Between 12-16 weeks          | 57(23.7)           | 29(29.3)         | 1.01(0.50-2.01) | 0.985   |
| Between 16-20 weeks          | 25(10.4)           | 6(6.1)           | 2.13(0.76-6.01) | 0.151   |

**Table 4. Bivariate analysis of utilization of reproductive health services among women receiving PAC who accepted and those who did not accept the HIV testing.**

| Characteristic                              | Accepted testing   |                  | OR (95% CI)      | P value |
|---|--------------------|------------------|------------------|---------|
|   | Yes<br>n = 241 (%) | No<br>n = 99 (%) |                  |         |
| <b>Ever used any family planning method</b> |                    |                  |                  |         |
| Yes   | 49(20.3)           | 25(25.3)         | 1.0(ref)         |         |
| No  | 192(79.7)          | 73(73.7)         | 1.34(0.77-2.33)  | 0.296   |
| <b>Type of family planning method used</b>  |                    |                  |                  |         |
| Injectable                                  | 25(10.4)           | 17(7.1)          | 1.0(ref)         |         |
| Implant                                     | 14(5.8)            | 10(4.1)          | 0.95(0.34-2.64)  | 0.925   |
| IUCD  | 3(1.2)             | 0(0.0)           | NA               |         |
| Others                                      | 5(2.1)             | 1(0.4)           | 3.40(0.36-31.74) | 0.283   |

**Table 5. Multivariable analysis of the factors associated with acceptability**

| Characteristic              | OR   | 95% CI     | P value |
|-----------------------------|------|------------|---------|
| <b>Age</b>                  |      |            |         |
| 15-19                       | 1.0  |            |         |
| 20-24                       | 1.99 | 1.02-3.88  | 0.043   |
| 25-29                       | 2.25 | 1.12-4.50  | 0.022   |
| 30-34                       | 4.38 | 1.26-11.84 | 0.004   |
| ≥35                         | 5.06 | 1.30-19.71 | 0.019   |
| <b>Level of education</b>   |      |            |         |
| None                        | 1.0  |            |         |
| Primary                     | 2.15 | 1.18-3.93  | 0.012   |
| Secondary                   | 1.97 | 1.03-3.78  | 0.041   |
| College/University          | 2.62 | 0.82-8.41  | 0.105   |
| <b>Previous HIV testing</b> |      |            |         |
| Yes                         | 1.0  |            |         |
| No                          | 0.83 | 0.46-1.47  | 0.516   |

Of the 340 women 262 (77.1%) had had prior HIV testing. The main reasons for HIV testing were routine ante-natal profiling (159, 68.8%) and self-awareness (58, 25.1%). All said that the results of the test were disclosed to them (2 (0.9%) were HIV positive).

There were no significant associations between factors in the reproductive health history and acceptance of HIV testing (Table 3).

Also, there were no significant associations between acceptance of testing and the utilisation of reproductive health services (Table 4).

However, age and level of education were significantly associated with acceptance of testing after adjusting for the effect of previous HIV testing (Table 5).

## DISCUSSION

This study reports a 70.9% acceptability of HIV testing which is comparable to the 67.9% observed at Kenyatta National Hospital (KNH).<sup>[7]</sup> Acceptance of HIV testing is crucial in combating the spread of infection.<sup>[8]</sup> In JTH a policy of provision of testing and counselling has not been included into the PAC services.

Among the 99 women who refused HIV screening, there might have been some who were infected and thus missing out on appropriate anti-retroviral treatment (ART). Most declined because they believe they were HIV negative based on previous tests. At the KNH, the prevalence of HIV was 31.8%.<sup>[7]</sup> This high figure may be attributed to the small sample size and that KNH is a referral hospital receiving high risk patients.

The socio-demographic characteristic of the women recruited into this study was comparable to previous similar ones<sup>[7, 9]</sup> characterized by a low level of education and unemployment. More than 75% in our cohort were married but there was no association between marital status and the acceptance of testing.

Our study found a significant association between educational level and HIV test acceptability agreeing with the KNH report.<sup>[7]</sup> This suggests that education plays a key role in the understanding of HIV campaign messages. Most communications are delivered in English or Classic Arabic which are not understood by most women in Juba. Studies have shown a high acceptance rate when HIV awareness and messaging is conducted in familiar languages<sup>[10, 11]</sup> Policy makers therefore need to bear in mind this communication issue when designing campaigns.

Our findings reveal that 77.1% of the participants had had prior HIV testing and they also had a high acceptance



rate of testing than women who had not been tested before (OR=1.74). A report from Ugandan study showed that women who had not been tested for HIV previously were 2.1 times more likely not to accept testing.<sup>[12]</sup> Religion and employment status were not associated with the acceptability of HIV testing. Rasch et.al in Tanzania<sup>[9]</sup> have reported that women who earn an income were more likely to accept HIV testing.

South Sudan has the highest unmet need for family planning<sup>[13]</sup> worldwide. Religious and cultural issues may play a part in this. Our study showed no association between the use of these family planning services and acceptability of HIV testing. These services are underutilized in JTH, however where they are available the acceptability of HIV testing improves.<sup>[13]</sup>

This study was conducted in an urban health facility so the results cannot be extrapolated to a rural setting where demographics are quite different.

## CONCLUSION

HIV testing is well accepted among PAC women in JTH and it should be integrated into the PAC services in all health facilities. Campaigns on regular screening for HIV and counselling services should be tailored to the needs and circumstances of all women of reproductive age. Key groups to be targeted are those with limited education through all forms of media and particularly in local languages. Women less than 20 years old should also be equipped and empowered with life skills regarding reproductive health services, HIV education and testing. These interventions should also extend to women who do not attend ANC through community health workers and outreach visits.

## References

- World Bulletin. South Sudan alarmed by rising HIV/AIDS prevalence [rates.www.worldbulletin.net/haber/144756/s-sudan-alarmed-by-rising-hiv-aids-prevalence-rates](http://www.worldbulletin.net/haber/144756/s-sudan-alarmed-by-rising-hiv-aids-prevalence-rates)
- South Sudan AIDS commission and Ministry of Health, June 2015, [www.unaids.org/sites/default/files/country/documents/SSD\\_narrative\\_report\\_2015.pdf](http://www.unaids.org/sites/default/files/country/documents/SSD_narrative_report_2015.pdf)
- South Sudan integrates HIV testing into other health services. [www.avert.org/news/south-sudan-integrates-hiv-testing-into-other-health-services](http://www.avert.org/news/south-sudan-integrates-hiv-testing-into-other-health-services).
- The HIV response in conflict: lessons learnt from South Sudan. International HIV/AIDS alliance case study 2014. [http://www.aidsalliance.org/assets/000/000/795/South\\_Sudan\\_report\\_original.pdf?1407227301](http://www.aidsalliance.org/assets/000/000/795/South_Sudan_report_original.pdf?1407227301)
- HIV/AIDS in sub Saharan Africa /AVERT [www.avert.org/hiv-aids-sub-saharan-africa](http://www.avert.org/hiv-aids-sub-saharan-africa).
- Fullerton JT, Ottolenghi E. Global post abortion care desk review. Washington (DC): The Global Health Technical Assistance Project; 2012.
- Chege H. Acceptability of rapid HIV test screening among patients presenting with incomplete abortion at Kenyatta National Hospital. M.Med Dissertation UON 2006.
- Boswell D, Kakonge L M, Kasonde F 2009. Are the counselors counseling? The impact of counseling training in Lusaka and reflections from the field report and abstract presented at ICASA, Lusaka Zambia September 1999.
- Rasch V, Yambesi F, Massawe S. post abortion care and voluntary HIV counseling and testing – an example of integrating HIV prevention into reproductive health services. Trop Med Int Health 2006 May; 11(5):697-704.
- Arulogun OS, Adewole IF, Olayinka-Alli L, Adesina AO. Community gate keepers' awareness and perception of prevention of mother-to-child transmission of HIV services in Ibadan. Nigeria. Afr J Reprod Health. 2007; 11:67-75. doi: [10.2307/30032489](https://doi.org/10.2307/30032489).
- Koo DJ, Begier EM, Henn MH, Sepkowitz KA, Kellerman SE. HIV counseling and testing: less targeting, more testing. Am J Public Health. 2006; 96:962-964. doi: [10.2105/AJPH.2006.089235](https://doi.org/10.2105/AJPH.2006.089235).
- V.Dahl et.al acceptance of HIV testing among women attending ante natal care in South- Western Uganda: risk factors and reasons for test refusal. AIDS CARE 2008; 20(6). [www.tandfonline.com/doi/abs/10.1080/09540120701693990](http://www.tandfonline.com/doi/abs/10.1080/09540120701693990)
- UNAIDS 23 June2014 Raising awareness of HIV testing and counseling in South Sudan. <http://www.unaids.org/en/resources/presscentre/featurestories/2014/june/20140623souths>

We thank the following who helped prepare this issue: Ajibola Abioye, Charles Bakheit, Nick Dyer, Brian Hancock, Ayat, Jervase, Nancy MacKeith, Martin Porter, Indranil Saha and Grace Juan Soma.

# Prevalence of primary Caesarean Section deliveries among primiparous and multiparous women at Iringa Regional Referral Hospital, Tanzania

Erick Augustino Mbunga<sup>a</sup>, Ipyana Hudson Mwampagatwa<sup>b</sup> and Alex Ibolinga Ernest<sup>b</sup>

<sup>a</sup> College of Health Science, School of Medicine and Dentistry, The University of Dodoma, Dodoma, Tanzania.

<sup>b</sup> Department of Obstetrics and Gynaecology, College of Health Sciences, The University of Dodoma, Dodoma, Tanzania

## Correspondence:

Erick Augustino Mbunga  
erickaugustino@yahoo.co.uk

Submitted: February 2019

Accepted: May 2019

Published: August 2019

## Citation:

Mbunga et al, Prevalence of primary Caesarean Section deliveries among primiparous and multiparous women at Iringa Regional Referral Hospital, Tanzania. South Sudan Medical Journal 2019; 12(3):106-108  
©2019 The Author (s)

## License:

This is an open access article under  
[CC BY-NC-ND](#)

**Introduction:** Primary Caesarean Section (CS) is an operation that is performed for the first time on a pregnant woman. Primary CS is of particular interest because it has an influence on future modes of delivery. There is also an issue about the original indication for the procedure both in a woman who has never tried her pelvis for vaginal delivery and a woman who has delivered vaginally in the past.

**Objectives:** To determine the prevalence, indications, and outcomes of primary CS deliveries among primiparous and multiparous women, and associations with some demographic characteristics among pregnant women who deliver at Iringa Regional Referral Hospital, Tanzania.

**Methods:** An analytical cross section hospital based study was used with a quantitative research approach. A sample size of 247 of primary CS deliveries was obtained. A structured questionnaire was used to collect the data and the Statistical Package for Service Solutions (v. 23) software programme was used for data entry and analysis.

**Results:** The prevalence rate of primary CS delivery was 247 (21.6%) out of 1144 deliveries between January 2017 and June 2018. The highest indication for CS was foetal distress which was foetal heart rate below 120b/m and above 160 b/m 79 (32.0%) followed by prolonged labour 65 (25.1%). Maternal outcomes revealed that 65 (26.3%) women experienced significant blood loss which was above 1000mls, with blood transfusion of at least more than one unit of blood (PPH) followed by 29 (11.7%) who experienced a high body temperature above 37.5 degree of centigrade. The new born outcomes found that 128 (51.8%) were unable to breast feed and 95 (38.5%) had low Apgar scores below 7 in the 1st and 5th minute.

**Conclusion:** There was a high prevalence of primary CS among primiparous and multiparous women which is above the recommended WHO threshold of 15%. Also, the highest indication for primary CS was foetal distress. The most common complication for the mother was significant blood loss and the commonest newborn complication was that the baby was unable to breastfeed.

**Key Words:** Caesarean Section (CS), primiparous and multiparous, Iringa, Tanzania

## INTRODUCTION

Caesarean Section (CS) is the surgical procedure by which a foetus is delivered through an incision in the mother's abdomen and uterus. It is called a primary CS when it is done for the first time on a pregnant woman.<sup>[1]</sup> Primary CS is of particular interest because it has an influence on future modes of delivery. There is also a concern about the indication for the procedure in a woman who has never tried her pelvis for vaginal delivery. It is a global issue because CS births are increasing,<sup>[1]</sup> with short and long term maternal and newborn implications,<sup>[2, 3]</sup> These include post CS infection, dangerous bleeding, increased need for blood transfusion, breathing problems and deaths among newborns, long hospital stay, risk of problems for future pregnancies including uterine rupture and maternal deaths.<sup>[1]</sup>

CS delivery is a commonly performed operation because it is a life-saving obstetric procedure for both the mother and the foetus and reduces poor obstetric outcomes.<sup>[1]</sup> Safety has increased following the introduction of good anaesthesia, blood transfusion facilities, and antibiotic prophylaxis. The rate of CS procedures has dramatically increased with its indications being liberalized to include foetal distress, dystocia, placenta praevia, as well as Bad Obstetric History (BOH).<sup>[2]</sup>

The objective of this paper was to determine the prevalence, indications, and outcomes of primary CS deliveries among primiparous and multiparous women, and associations with some demographic characteristics among pregnant women who deliver at Iringa Regional Referral Hospital, Tanzania.

## METHOD

An analytical cross section hospital based study with a quantitative research approach was utilized between January 2017 and June 2018. A sample size of 247 of primary CS deliveries was obtained. A structured questionnaire was used to collect data, and the Statistical Package for Service Solutions (v. 23) software programme was used for data entry and analysis.

## RESULTS

219 (88.7%) of the cases reviewed were aged between 19 and 39 years. Additional demographic characteristics of the respondents are shown in the Table 1.

Out of 1 144 deliveries, 247(21.6%) were primary CS deliveries and 897 (78.4%) deliveries were other than CS. Most of respondents who underwent primary CS delivery were multiparous (53%) followed by primiparous (47%), as shown in Figure 1.

As shown in Table 2, the commonest indications for CS were foetal distress (32.0%), prolonged labour (25.1%) and obstructed labour (20.2%).

For the maternal outcomes of the primary CS deliveries, there were significant blood loss per vaginam in only 65 cases (25%) and high body temperature in only 182 cases (11.7%). The newborn outcomes for live babies within days of hospital stay is shown in Table 3.

## DISCUSSION

It has been reported that primigravida women are more prone to primary CS deliveries and their associated outcomes as compared to multigravida women because locally used protocols, unsatisfactory staff motivation, inadequate capacities to handle cases among young doctors, midwives and availability of medical supplies and equipment [4]. This is contrary to what has been observed in the current study in which multiparous women who underwent CS section were found to be 53% as compared to primiparous women.

**Table 1. Demographic characteristics of the respondents (n=247)**

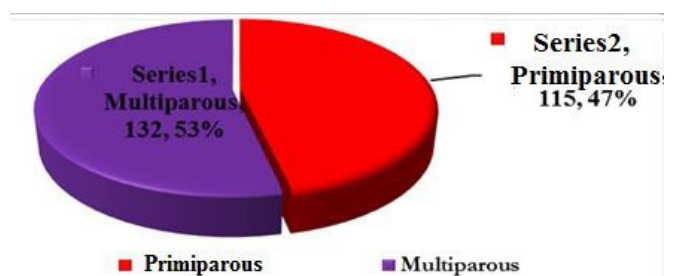
| Characteristic             | n (%)      |
|----------------------------|------------|
| <b>Age years</b>           |            |
| ≤ 18                       | 24 (9.7)   |
| 19 – 39                    | 219 (88.7) |
| ≥ 40                       | 4 (1.6)    |
| <b>Education level</b>     |            |
| No formal education        | 31 (12.6)  |
| Primary education          | 81 (32.8)  |
| Secondary education        | 53 (21.5)  |
| College/University         | 82 (33.2)  |
| <b>Marital status</b>      |            |
| Single                     | 50 (20.2)  |
| Married                    | 197 (79.8) |
| <b>Occupational status</b> |            |
| Employed                   | 40 (16.2)  |
| Self employed              | 96 (38.9)  |
| Housewife                  | 111(44.9)  |

**Table 2. Indication for Caesarean Section (n=247)**

| Indicators             | n (%)       |
|------------------------|-------------|
| <b>Foetal distress</b> | 79 (32.0)   |
| Obstructed labour      | 50 (20.2)   |
| Malposition            | 33 (13.4)   |
| Prolonged labour       | 62 (25.1)   |
| Others                 | 23 (9.3)    |
| <b>Total</b>           | 247 (100.0) |

**Table 3. Newborn outcomes for live babies within days of hospital stay**

| Variable                     | n (%)      |
|------------------------------|------------|
| <b>Low Apgar Score</b>       |            |
| Yes                          | 95 (38.5)  |
| No                           | 152 (61.5) |
| <b>Ability To Breastfeed</b> |            |
| Yes                          | 119 (48.2) |
| No                           | 128 (51.8) |
| <b>High Body Temperature</b> |            |
| Yes                          | 28 (11.3)  |
| No                           | 219 (88.7) |



**Figure 1. Prevalence of Caesarean Section delivery among primiparous and multiparous women**

This was consistent with findings from India<sup>[5,6]</sup> which found a higher prevalence of CS deliveries among multiparous women as compared to primiparous. This trend could be attributed to factors such as education level.

However, many women in Tanzania still deliver at home and only attend a hospital if there are problems such as prolonged labour. It is difficult to find out how many do this. The WHO threshold is for all births in a population, not just the hospital. The percentage may be lower than 21.6% when looked at in this way.

## CONCLUSION

The prevalence of primary CS in this study was 21.6% and the leading indications for primary CS were foetal distress, prolonged labour, obstructed labour, malposition, and others in that order.

## Recommendations

Based on the findings of the current study, it is recommended that there should be an innovative structured educational programme of training, seminars or workshops for healthcare providers so that they focus on the recommended indications for primary CS deliveries. This should be achieved by proper adherence to the guidelines for CS from the Association of Gynecologists and Obstetricians of Tanzania. This will ensure the CS deliveries are done for clear clinical indications. If these issues are not adequately addressed both locally and country-wide, there may be an unnecessary increased CS delivery rate and its associated maternal and newborn negative health impact will become worse.

## Acknowledgment

Thanks go to Professor Ipyana Mwampagatwa and Dr Alex Ibolinga Ernest, my research supervisors, for their valuable contribution to this study and to the Dean, staff and students of the University of Dodoma, College of Health Science, School of Medicine and Dentistry and to the Consultant Gynecologists of Iringa Regional Referral Hospital Dr Laison Alfred Mwakalebela, Professor Vann Roosmalen, and Dr Sotel Kusekwa, and to Alexadra Kaberege and other health workers for their financial and technical support.

**Competing interest:** The authors declare that they have no competing interests.

## References

1. World Health Organization. WHO Statement on Caesarean Section rates. *Reproductive Health Matters* 2015; 23(45): 149–150. <https://doi.org/10.1016/j.rhm.2015.07.007>
2. Bayou YT, Mashalla YJS, Thupayagale-Tshweneagae G.. Patterns of Caesarean Section delivery in Addis Ababa. Ethiopia. *African Journal of Primary Health Care and Family Medicine* 2016; 8(2): 1–6. <https://doi.org/10.4102/phcfm.v8i2.953>
3. Nilsen C, Østbye T, Daltveit AK, Mmbaga BT, Sandøy IF. (2014). Trends in and socio-demographic factors associated with Caesarean Section at a Tanzanian referral hospital, 2000 to 2013. *International Journal for Equity in Health* 2014;13(1):87. <https://doi.org/10.1186/s12939-014-0087-1>
4. Suresh YA, Suresh YV. A Prospective Comparative Study of Caesarean Section. *International Journal of Pharma and Bio Sciences* 2017; 8(3):890–95.
5. Sharmila G, Nishitha Ch.. Study of Primary Caesarean Section in Multigravida. *Asian Pacific Journal of Health Sciences* 2016; 3(4):89–94. <http://www.apjhs.com/pdf/14-Study-of-primary-caesarean-section-in-multigravida.pdf>
6. Dhodapkar S, Bhairavi S, Daniel M, Chauhan N, Chauhan R.. Analysis of Caesarean Sections According to Robson's Ten Group Classification System at a Tertiary Care Teaching Hospital in South India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* 2015; 4(3):745–49. <https://www.ijrcog.org/index.php/ijrcog/article/view/1995>

## Erratum

In the 3rd paragraph, 4th line of an article, “How can we bridge the gap between literacy and health in South Sudan? *South Sudan Medical Journal* 2019; 12(2):66-68, 2019”, the figure for adult literacy rate change between 2008(27%) and projected rate by 2015(32%) was wrongly quoted as 19.18% when it is actually 5%.

Correction: “In South Sudan, the adult literacy rate was 32% in 2015[3], up by 5% from 2008(27%)[3,4] but is still one of the lowest rates in the world today.”



# Case Report: Huge inclusion cyst as a long term complication of female genital mutilation

**Raymond Takpe, Oluwasomidoyin  
Olukemi Bello and Chinedum A.C  
Onebunne**

Department of Obstetrics and Gynaecology,  
University College Hospital, Ibadan, Nigeria

Correspondence:  
Oluwasomidoyin Olukemi Bello  
[oluwasomidoyin@gmail.com](mailto:oluwasomidoyin@gmail.com)

Submitted: March 2019  
Accepted: July 2019  
Published: August 2019

Female genital mutilation (FGM) is a common practice in Nigeria and is performed for religious and cultural reasons despite associated short- and long-term complications. Epidermoid inclusion cyst of the external genitalia is one of its late complications.

We describe the successful management of a huge painless vulva mass measuring 10cm by 8cm in a 40-year-old woman. She had excision of the cyst with histological diagnosis of epidermal inclusion cyst. There is need for medical practitioners to have a high index of suspicion of epidermal inclusion cyst for vulva swelling especially in Nigeria where FGM is prevalent. However, public enlightenment and enforcement of laws on eradication of FGM as well as management of its complications are crucial.

**Key words:** FGM, vulva swelling, inclusion cyst

## Introduction

A vulva epidermoid inclusion cyst often presents in the perimenarcheal period as one of the late complications of FGM.<sup>[1]</sup> It may involve the vagina, vulva, or clitoris. The cyst is usually small and painless although large sizes have been reported.<sup>[2,3]</sup> It may occur years after FGM as a result of implantation of squamous epithelium under the dermis or subcutaneous tissue which leads to accumulation of epidermal desquamations, secretions, and debris in a closed space.<sup>[4,5]</sup> The cyst is usually slow growing but has a rapid growth in the perimenarcheal period due to increased vagina and vulva secretions resulting from high oestrogen levels.<sup>[5,6]</sup>

Most patients present late because it is painless and slow growing. However if they develop complications like pain, difficulty in walking or micturition, sexual difficulty, or discharge from the swelling they may present early.<sup>[6]</sup> The diagnosis is made by clinical examination and confirmed with histology. Ultrasonography and magnetic resonance imaging are useful in differentiating it from other forms of vulva tumours.<sup>[5]</sup>

Excision is the management of choice but the surgical removal of a large cyst is challenging especially considering cosmetic outcome.<sup>[6]</sup> Therefore, we present the successful management and outcome of a huge epidermoid inclusion cyst that developed about three decades after FGM was performed.

## Case Report

Mrs AA, a 40-year-old P1+1 (1Alive) woman, presented with a 7-year history of a progressively increasing swelling in the external genitalia. There were associated sexual difficulty and psychological disturbance but no history of difficulty with walking or urination. She experienced pain with associated tenderness and purulent discharge from the swelling 5 years prior to presentation. Tenderness subsided and the purulent discharge ceased with spontaneous healing of the sinus following course of antibiotics. The swelling however recurred. There was history of circumcision in infancy but no other history of genital trauma. She had a normal menstrual history and an uneventful hospital supervised pregnancy and delivery.

### Citation:

Takpe et al, Case Report: Huge Inclusion cyst as a long term complication of female genital mutilation, South Sudan Medical Journal 2019; 12(3):109-111

© 2019 The Author (s)

### License:

This is an open access article under  
[CC BY-NC-ND](https://creativecommons.org/licenses/by-nc-nd/4.0/)



Figure 1. Mass involving right periclitoral area, residual labia minora, mons pubis and obscuring the urethral meatus - before surgery (credit O.O. Bello).



Figure 2. Successful dissection of the surrounding structure (credit O.O. Bello)



Figure 3. Vulva cosmetically re-fashioned (credit O.O. Bello)

The woman had normal secondary sexual characteristics and no feature of hyperandrogenism. A 10cm by 8cm rounded non-tender, mobile, cystic mass with normal overlying skin involving the right periclitoral area, residual labia minora, mons pubis and stretching the ventral skin of the urethra was noted (Figure 1). The residual clitoris was palpable beneath and separate from the cyst; thereby ruling out clitoromegaly. The vagina, cervix, and uterus were normal on speculum and digital examinations with no palpable inguinal lymph nodes. Other systems were normal as were the investigation results. An informed consent for surgical excision was obtained followed by successful excision without complications (Figure 2).

Operative findings included the presence of a subcutaneous well-encapsulated cystic mass with a well demarcated plane of cleavage between the overlying skin and cyst wall. The cyst was dissected from the surrounding structures and excised intact, redundant vulva tissue trimmed and the skin margin repaired with 3/0 polyglactin (Figure 3). Her postoperative recovery was uneventful. She had no complaints at two weeks and one month follow ups. She had resumed sexual intercourse which was satisfactory, without difficulty or pain, and was psychologically satisfied with her new genitalia appearance (Figure 4). The histology revealed a keratinous smooth cystic wall composed of laminated keratin and lined by stratified squamous cells with a granular cell layer.

### Discussion

Epidermoid inclusion cysts are slowly growing tumours that arise due to the invagination of epidermis into the dermis following trauma. While common locations are the face, scalp, neck and trunk, external genitalia can also be affected with scrotal, labial or clitoral involvement.<sup>[4,5]</sup> This is a possible finding in women with prior history of FGM like the patient presented who had type II FGM in infancy and presenting with vulva swelling more than three decades later.<sup>[2,5,7]</sup> However, anecdotal cases of epidermal cysts localized on the clitoris and labia in patients without any history of trauma or surgery have been reported.<sup>[3]</sup>

The period of delay from FGM to development of the epidermoid inclusion cyst varies and this is postulated to be as a result of unopposed oestrogenic stimulation of the embedded epidermal tissue and sebaceous glands into the dermis during the woman's anovulatory stages.<sup>[8]</sup> This is not true for the patient presented, who was 40 years old and had regular menstrual cycles.

The patients frequently present with an asymptomatic, slowly growing vulva mass and few associated symptoms.<sup>[4,6,7]</sup> Although purulent discharge and pain at the swelling are relatively uncommon findings, our patient had experienced both symptoms 5 years prior to presentation and was managed with antibiotics only. This calls for medical practitioners to be alert to this long-term complication of FGM and its management because if the residual cyst wall had been excised after antibiotics treatment it would have prevented the recurrent swelling, psychological disturbance and sexual difficulty that this patient experienced.

Management of an epidermoid inclusion cyst is total excision to prevent recurrence. Considering the large size of the cyst and

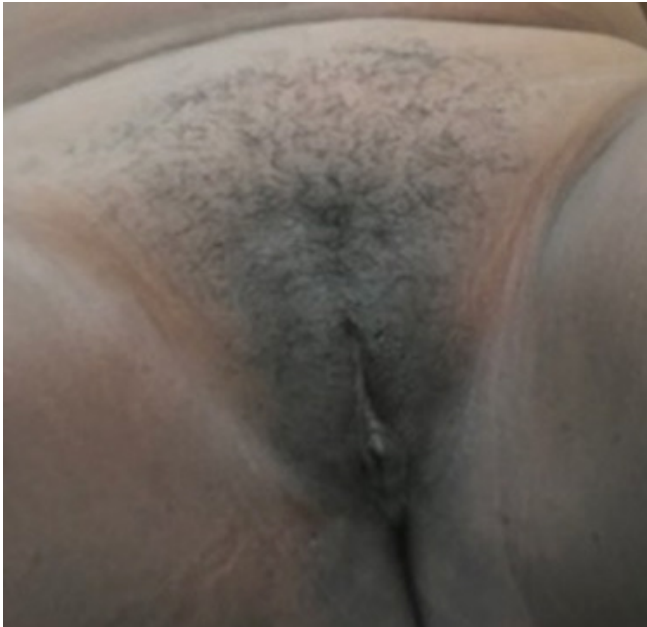


Figure 4. At 1-month follow-up (credit O.O. Bello)

anticipated challenges in our patient, the cyst was carefully enucleated without damage to surrounding structures with haemostasis secured and cosmetic refashioning of the external genital performed. This gives her aesthetically acceptable external genitalia with a normal urethral orifice thus reducing psychological problems or the need for further genital cosmetic surgery.<sup>[9]</sup>

Differential diagnosis must include vulva benign tumours like cyst of the canal of Nuck and Bartholin's cyst and malignant tumours of the vulva such as liposarcoma.<sup>[3]</sup> The diagnosis is confirmed on histologic examination which reveals a cyst lined by keratinized stratified squamous epithelium due to invagination of the epidermal keratinized squamous epithelial cells and sebaceous glands in the line of the clitoral circumcision scar, which then desquamates into a closed space to form a cyst.<sup>[10]</sup>

### Conclusion

Medical practitioners should be aware of all the associated complications of FGM as well as the anatomical and surgical technique of excision of huge vulva cysts with the aim of achieving a successful surgical and cosmetic outcome. In addition the psychological and psychosexual impact on women's health should be considered. There is a need for more public health campaigns to educate communities about the complications of FGM and laws associated with its ban be enforced.

### Conflict of Interest

All authors declare no conflict of interest.

### Consent for publication

A written informed consent was obtained from the patient

for publication of this case report and accompanying images.

### References

1. Ekanath L, Rajasekaran A. A Rare Case of Epidermoid Cyst of Clitoris. *Int J Cur Res Rev*, 2013;05(23):10–2.
2. Gudu W. Surgical Management of a Huge Post- Circumcision Epidermoid Cyst of The Vulva Presenting Unusually in a Postmenopausal Woman : A Case Report. *J Med Case Reports*. 2018;10–3.
3. Pehlivan M, Özün P, Temur M, Yılmaz Ö. Gümü Z, Güzel A Epidermal Cyst in An Unusual Site : A Case Report. *Int J Surg Case Reports J*. 2015;8C:114–6.
4. Rouzi AA, Sindi O, Facharzt BR, Ba'aqeel H. Epidermal clitoral inclusion cyst after type I female genital mutilation. *Am J Obstet Gynecol*. 001;185:569e71.
5. Osifo OD. Post Genital Mutilation Giant Clitoral Epidermoid Inclusion Cyst in Benin City, Nigeria. *J Pediatr Adolesc Gynecol*. 2010;23:336–e340.
6. Karaman E, et al. Giant Vulvar Epidermoid Cyst in an Adolescent Girl. *Hindawi Publishing Corporation Case Reports in Obstetrics and Gynecology Volume 2015, Article ID 942190*.
7. Berg RC, Underland V. *Gynecological Consequences of Female Genital Mutilation/ Cutting (FGM/C)* Oslo, Norway: Knowledge Centre for the Health Services at The Norwegian Institute of Public Health (NIPH); 2014 May. Report from Norwegian Knowledge Centre for the Health Services (NOKC) No. 11-2014. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK464818/>
8. Rizk DE. A large clitoral epidermoid inclusion cyst first presenting in adulthood following childhood circumcision. *J Obstet Gynaecol* 2007;27:445–8.
9. Moran C, Lee C. 'Everyone wants a vagina that looks less like a vagina': Australian women's views on dissatisfaction with genital appearance. *J Health Psychol* 2018;23:229-39
10. Kroll GL, Miller L. Vulvar epithelial inclusion cyst as a late complication of childhood female traditional genital surgery. *Am J Obstet Gynecol* 2000;183:509–10.



# Case Report: Ultra-Short Bowel Syndrome after a near-total small bowel resection for gangrene due to volvulus in a district hospital in South Sudan

## Koma Akim

General Surgeon/Health Coordinator, St. Theresa Mission Hospital, Isohe, Caritas Torit, Torit State, South Sudan,

Correspondence:  
Koma Akim,  
[akimkoma@gmail.com](mailto:akimkoma@gmail.com)

Submitted: April 2019  
Accepted: June 2019  
Published: August 2019

## Introduction

The length of the small intestine ranges between 3m-10m with an average of 6.5m.<sup>[1]</sup> It is made up of the duodenum (25cm), jejunum (1.5m), and ileum (distal three fifths). Resection of up to a third or even half is compatible with a normal life. However, survival has been reported with a small bowel length of only 45 cm.<sup>[2]</sup> A major resection leads to the small gut syndrome of malabsorption of macro and micro nutrients.<sup>[3]</sup> The classical symptoms are diarrhoea and those arising from malabsorption. Long term survival is enhanced with the use of parenteral nutrition<sup>[4]</sup> but there are no publications of survival without parenteral nutrition. Small bowel volvulus causing gangrenous bowel is one of the commonest reasons for major small bowel resection.<sup>[5]</sup> This case report highlights the survival of a patient who had major small bowel resection, developed ultra-short gut syndrome (USBS) and the challenges in managing the patient.

## Case presentation

The case is of a 15-year-old female pupil at a local primary school. She had been sick for more than three months frequently attending various hospitals and outpatient clinics with no improvement. For five days before her admission, she complained of abdominal pain, constipation, abdominal distention, vomiting, dizziness, easy fatigability and palpitations. There were no other symptoms from a systematic enquiry. Menstrual cycles had not begun. There was no history of prior abdominal surgery.

The patient looked unwell, lying motionless, in moderate pain, very pale, not jaundiced, no lymphadenopathy but mildly dehydrated. Her blood pressure was 106/70mmHg, and the pulse rate was 108/min, respiratory rate of 21/min, temperature of 37.7°C. The abdomen was symmetrical, not moving with respiration, with generalized tenderness, guarding, rebound tenderness, board-like rigidity, moderately distended, and absent bowel sounds. The rectum was empty on digital examination.

The differential diagnosis included peritonitis secondary to perforated bowel, intestinal obstruction secondary to volvulus and a ruptured ectopic pregnancy.

Facilities for an abdominal X-ray were not available but an ultrasound scan showed intestinal obstruction with peritoneal fluid. Haemoglobin was 11g/dl and urine HCG was negative. Other laboratory tests were not possible. After blood grouping two units of blood were held on standby.

## Preoperative management

The patient was kept nil by mouth, given antibiotics ( intravenous ceftriaxone 1g stat, intravenous metronidazole 500mg stat, intravenous gentamicin 80mg stat ), analgesia (intravenous tramadol 100mg stat ), intravenous fluids ( IVF Ringers Lactate 1.5 litres in 6 hours, intravenous dextrose 50mls of 50% stat), naso-gastric tube (NGT), urethral catheter.

## Citation:

Akim, Case report: Ultra-Short Bowel Syndrome after a near-total small bowel resection for gangrene due to volvulus in a District Hospital in South Sudan, South Sudan Medical Journal 2019; 12(3):112-114

© 2019 The Author (s)

## License:

This is an open access article under

[CC BY-NC-ND](https://creativecommons.org/licenses/by-nc-nd/4.0/)



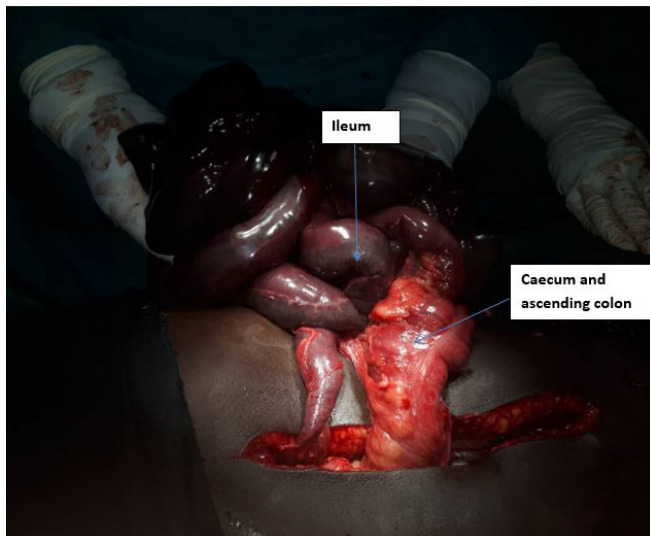


Figure 1. Note the gangrene involving the caecum and ascending colon (credit Dr Bulus Lawrance)

### Intraoperative management

After almost four hours resuscitative measures an emergency laparotomy via a midline incision was carried out under ketamine anaesthesia. The small bowel was covered with gangrenous omentum with a volvulus twisted through 270 degrees. Almost all of the small bowel and about 10cm of the caecum and the ascending colon were gangrenous. There were about 150 mls of dark brown peritoneal fluid. There were no viscus perforations. A near total small bowel resection and a limited right hemicolectomy were done. She was left with a jejunum of approximately 5 cm and a jejuno-transverse colonic primary anastomosis. The intraoperative findings are as shown in Figures 1 and 2.

### Postoperative management and progress

The patient continued with a NGT and nil by mouth, intravenous fluids (Ringers lactate 3litres in 24hours for a week, intravenous 50% dextrose 50mls four hourly for a week), antibiotics (intravenous ceftriaxone 1g daily for a week, intravenous metronidazole 500mg three times a day for a week, intravenous gentamicin 80mg three times a day for a week, proton pump inhibitor (intravenous pantoprazole 20mg daily for week) to reduce gastric hypersecretions and analgesia (intravenous tramadol 50mg three times a day for a week).

The first three days were uneventful. However, on days 4-6 she developed watery diarrhoea and vomiting. On day 7 the surgical site was found to be infected with a degree of wound dehiscence. On day 10 she developed a minor anastomotic leak which was managed conservatively (daily dressing of the wound, allowing free drainage of the fluid, kept her nil by mouth, she was put on intravenous fluids i.e. Ringers lactate 3 litres daily alternating with 5% dextrose). The anastomotic leak healed after about four

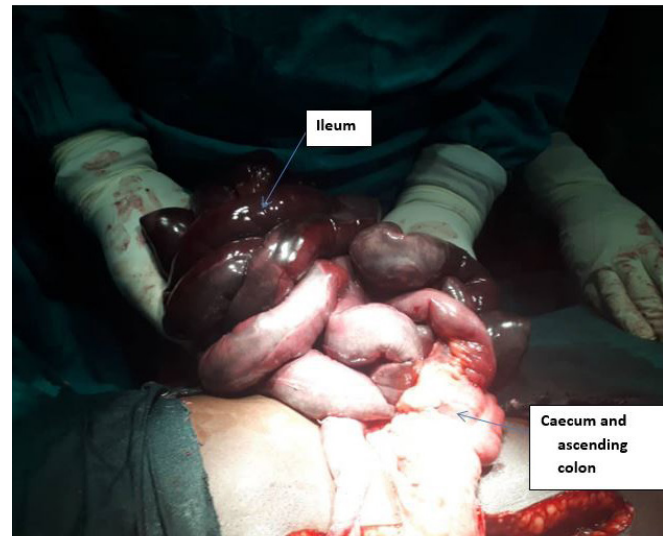


Figure 2. Derotation of the small bowel volvulus (credit Dr Bulus Lawrance)

weeks. She was discharged 3 weeks after her operation and reviewed at least weekly whenever necessary.

Approximately, about a month later after the operation, she was in a fair general condition but started exhibiting signs and symptoms of malnutrition which included weight loss, loss of muscle mass, dry and flaky skin, peripheral lower limbs oedema, malaise and generalized body weakness. She had started on the family diet (given every 4-6 hours) a fortnight after surgery. However, because she was eating very little she was also put on Corn Soya Blend (CSB), three times daily. CSB is a fortified blended food supplement, consisting of maize and soya flour fortified with vitamins and minerals, used to treat malnutrition.

The second and third months post operatively were characterized by sporadic episodes of diarrhoea and vomiting. She received home-made mango and orange juice and sometimes drank milk. She was also put on about 1.5 litres of intravenous Ringers lactate while at home supervised by an aunt who was a nurse. The aunt was reported to have tried giving ORS but, due to persistent vomiting, she stopped and gave Ringers lactate to which she had access.

Around two and half months after surgery, the girl developed a persistent cough for almost two weeks. The plan was to investigate her for tuberculosis. However, the only X-ray machine malfunctioned and therefore the CXR could not be done. Sputum for AAFBs was also planned, but this too did not materialized because of the IDD holidays.

Three months after the surgery she was brought to the hospital with a one-week history of persistent postprandial vomiting (containing the food eaten, not blood stained) and watery diarrhoea (not blood stained) three to four

times in a day. On examination, she was ill-looking, cachectic, severely dehydrated, not jaundiced and mildly pale.

Respiratory system examination: Respiratory rate of 21/min, some crepitations but no bronchial breathing. Cardiovascular examination: Pulse rate 113/min weak and thready, BP 90/50mmHg, no heave, no thrill, heart sound 1 and 2 heard, there was no murmur. Abdomen examination: Moving with respiration, a midline scar, reduced skin turgor, no tenderness, bowel sounds were present. Because of these features of hypovolaemia she was started on intravenous Ringers lactate: 1 litre over 10-15 minutes and 1.5litres 4 hourly. Sadly, however, she died approximately six hours after admission. Unfortunately in Torit Town we did not have access to biochemical measurements so cannot comment on her electrolyte and renal function.

We were initially encouraged by the progress of this patient but the outcome demonstrates how serious USBS is and how difficult it is to manage especially without extensive resources.

### Discussion

The near total resection of the small intestine in this patient resulted into USBS with approximately less than 10cm of small bowel remaining.<sup>[6]</sup> The symptoms of USBS are diarrhoea, vomiting, abdominal pain, weight loss and extreme fatigue. The morbidity and mortality rates associated with USBS are higher than those for short bowel syndrome. Short bowel syndrome is associated with a reduced quality of life and mortality of 10-15 % over 5 years.<sup>[7]</sup> The survival of patients with USBS without TPN and / or small bowel transplant is not known.

### Challenges to treating USBS in South Sudan

a. Diagnostic: The investigative and diagnostic capability of the hospital laboratory and radiology services are limited because of malfunction and financial constraints.

b. Economic: Total Parenteral Nutrition (TPN) is not generally available in South Sudan. Even when TPN is obtainable it is very expensive (about US\$ 300 per day) and beyond the reach of most people.

c. Social: Attendance at school and relationships outside and within the family setting have been disrupted.

d. Advances in treatment: Total Parenteral Nutrition (TPN) is a bridge to small bowel transplantation but in South Sudan such care is not possible.

### References

1. Ellis H, Mahadevan V. *Clinical anatomy: applied anatomy for students and junior doctors*: Wiley-Blackwell; 2018.
2. Liu M-Y, Tang H-C, Yang H-L, Chang S-J. A Short Bowel (Small Intestine= 40 cm), No Ileocecal Valve, and Colonic Inertia Patient Works Well with Oral Intake Alone without Parenteral Nutrition. *Case reports in surgery*. 2014;2014.
3. O'keefe SJ, Buchman AL, Fishbein TM, Jeejeebhoy KN, Jeppesen PB, Shaffer J. Short bowel syndrome and intestinal failure: consensus definitions and overview. *Clinical Gastroenterology and Hepatology*. 2006;4(1):6-10.
4. Wilmore DW, Dudrick SJ. Growth and development of an infant receiving all nutrients exclusively by vein. *Jama*. 1968;203(10):860-4.
5. Sala D, Chomto S, Hill S, editors. Long-term outcomes of short bowel syndrome requiring long-term/home intravenous nutrition compared in children with gastroschisis and those with volvulus. *Transplantation proceedings*; 2010: Elsevier.
6. Dore M, Junco PT, Moreno AA, Cerezo VN, Muñoz MR, Galán AS, et al. Ultrashort bowel syndrome outcome in children treated in a multidisciplinary intestinal rehabilitation unit. *European Journal of Pediatric Surgery*. 2017;27(01):116-20.
7. DeLegge M, Alsolaiman MM, Barbour E, Bassas S, Siddiqi MF, Moore NM. Short bowel syndrome: parenteral nutrition versus intestinal transplantation. *Where are we today? Digestive diseases and sciences*. 2007;52(4):876-92.

#### BACK COVER IMAGE:

#### CDC: Is it Flu or Ebola?

Credit: CDC Ebola awareness poster [www.cdc.gov/flu](http://www.cdc.gov/flu) and [www.cdc.gov/ebola](http://www.cdc.gov/ebola).

# Gunshot injuries remain high despite peace deal

Press release from International Committee of the Red Cross  
8 July 2019

Juba (ICRC) - The number of patients admitted to International Committee of the Red Cross (ICRC)-supported surgical units in South Sudan with injuries from violence remains high ten months after the signing of a peace agreement.

There has been only a small drop-off in the number of injuries from gunshot and other weapons at two ICRC-supported facilities (comparing the same six-month period year-on-year) since the signing of the latest peace deal in September 2018. Ninety-seven percent of admitted patients over a recent six-month period suffered gunshot wounds, an indication of the high prevalence and easy access to fire arms.

“We have seen a drop in fighting between parties to the conflict, a very hopeful sign. However, intercommunal violence—mostly linked to cattle raids and revenge killing—continues to threaten lives at an alarming level,” said James Reynolds, ICRC head of delegation in South Sudan.

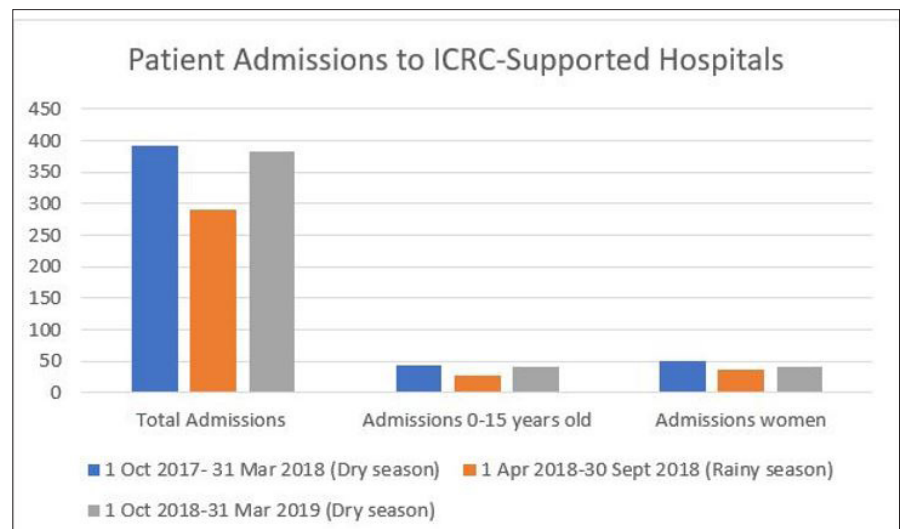
Women and children remain particularly vulnerable; about 10 percent of patients seen from October 1, 2018 to March 31, 2019 were children under the age of 15, while just over 10 percent were women.

South Sudan marks eight years of independence on Tuesday. In recent months, many residents have returned home from abroad or other parts of the country. At the same time, intercommunal violence has forced thousands of South Sudanese to flee their homes. More than 50,000 families have received seeds and tools from the ICRC since the beginning of the year, but those who left home for reasons of safety will not be able to harvest their crops. Millions of South Sudanese are already facing severe food insecurity.

“Stability will be key for South Sudanese to recover from years of conflict. Any form of violence again prevents them from a normal, peaceful life,” Reynolds said. “We will continue to deliver emergency assistance to communities affected by violence, but we hope to put more of our efforts into helping people recover and prosper, not just survive.”

Note on the numbers: From October 2017 to March 2018 there were 392 patients admitted to ICRC-supported medical facilities in Ganyliel and Juba with gunshot/weapon-related injuries. From April to September 2018 (the rainy season), there were 291 patients. From October 2018 to March 2019 there were 382 patients.

Published with permission from ICRC [www.icrc.org](http://www.icrc.org)



There has been only a small drop-off in the number of injuries from gunshot and other weapons at two ICRC-supported facilities (comparing the same six-month period year-on-year) since the signing of the latest peace deal in September 2018. Ninety-seven percent of admitted patients over a recent six-month period suffered gunshot wounds, an indication of the high prevalence and easy access to fire arms.

“We have seen a drop in fighting between parties to the conflict, a very hopeful sign. However, intercommunal violence—mostly linked to cattle raids and revenge killing—continues to threaten lives at an alarming level,” said James Reynolds, ICRC head of delegation in South Sudan.

Women and children remain particularly vulnerable; about 10 percent of patients seen from October 1, 2018 to March 31, 2019 were children under the age of 15, while just over 10 percent were women.

South Sudan marks eight years of independence on Tuesday. In recent months, many residents have returned home from abroad or other parts of the country. At the same time, intercommunal violence has forced thousands of South Sudanese to flee their homes. More than 50,000 families have received seeds and tools from the ICRC since the beginning of the year, but those who left home for reasons of safety will not be able to harvest their crops. Millions of South Sudanese are already facing severe food insecurity.

“Stability will be key for South Sudanese to recover from years of conflict. Any form of violence again prevents them from a normal, peaceful life,” Reynolds said. “We will continue to deliver emergency assistance to communities affected by violence, but we hope to put more of our efforts into helping people recover and prosper, not just survive.”

Note on the numbers: From October 2017 to March 2018 there were 392 patients admitted to ICRC-supported medical facilities in Ganyliel and Juba with gunshot/weapon-related injuries. From April to September 2018 (the rainy season), there were 291 patients. From October 2018 to March 2019 there were 382 patients.

Published with permission from ICRC [www.icrc.org](http://www.icrc.org)

## ANSWERS TO QUIZ FROM PAGE 100:

1. Foetal distress, prolonged labour, obstructed labour and malposition of the baby.
2. 21.6%
3. Maxillary sinuses.
4. 1.07%
5. Nasal obstruction, nasal discharge, postnasal discharge, reduced sense of smell.
6. HIV.
7. 60 years and over.
8. Maternal characteristics, placenta function and umbilical cord morphology.
9. Low placental weight, fewer cotyledons, placental thickness.
10. Yes.

# Is it Flu or Ebola?



## Flu (influenza)



The flu is a common contagious respiratory illness caused by flu viruses. The flu is different from a cold.

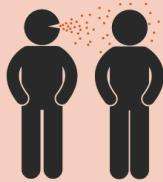
Flu can cause mild to severe illness, and complications can lead to death.

## Ebola



Ebola is a rare and deadly disease caused by infection with an Ebola virus. Sporadic outbreaks have occurred in some African countries since 1976.

## How Flu Germs Are Spread



The flu is spread mainly by droplets made when people who have flu cough, sneeze, or talk. Viruses can also spread on surfaces, but this is less common.

People with flu can spread the virus before and during their illness.

## How Ebola Germs are Spread



People get Ebola by direct contact with

- The body fluids of a person who is sick with or has died from Ebola.
- Objects contaminated with body fluids of a person sick with Ebola or who has died of Ebola.
- Infected fruit bats and primates (apes and monkeys)
- And, possibly from contact with semen from a man who has recovered from Ebola (for example, by having oral, vaginal, or anal sex)

## Who Gets The Flu?



Anyone can get the flu.

Some people—like very young children, older adults, and people with some health conditions—are at high risk of serious complications.

## Who Gets Ebola?



People most at risk of getting Ebola are

- People with a travel history to countries with widespread transmission or exposure to a person with Ebola.
- Healthcare providers taking care of patients with Ebola.
- Friends and family who have had unprotected direct contact with blood or body fluids of a person sick with Ebola.

## Signs and Symptoms of Flu



The signs and symptoms of flu usually develop within 2 days after exposure. Symptoms come on quickly and all at once.

## Signs and Symptoms of Ebola



The signs and symptoms of Ebola can appear 2 to 21 days after exposure. The average time is 8 to 10 days. Symptoms of Ebola develop over several days and become progressively more severe.

- **People with Ebola cannot spread the virus until symptoms appear.**



- **Fever or feeling feverish**
- **Headache**
- **Muscle or body aches**
- **Feeling very tired (fatigue)**
- **Cough**
- **Sore throat**
- **Runny or stuffy nose**



- **Fever**
- **Severe headache**
- **Muscle pain**
- **Feeling very tired (fatigue)**
- **Vomiting and diarrhea develop after 3–6 days**
- **Weakness (can be severe)**
- **Stomach pain**
- **Unexplained bleeding or bruising**

For more information about the flu and Ebola, visit [www.cdc.gov/flu](http://www.cdc.gov/flu) and [www.cdc.gov/ebola](http://www.cdc.gov/ebola).

May 4, 2015

CS252296-1

Every effort has been made to ensure that the information and the drug names and doses quoted in this Journal are correct. However readers are advised to check information and doses before making prescriptions. Unless otherwise stated the doses quoted are for adults.