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- Caesarean Section knowledge and acceptance
- Obstetric fistulae birth outcomes and repair
- How to repair a vesico-vaginal fistula
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Front cover photo: Transmission Electron Microscopic (TEM) image of an Ebola virus virion - CDC Public Health Image Library ID #1833 (Credit: Frederick A. Murphy)



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

Keeping an eye on Ebola Virus Disease

Between June and November 1976, the medical world was baffled by an outbreak of a ferocious haemorrhagic disease in Nzara, South Sudan (then part of Sudan). The disease subsequently spread to Maridi and Tombura towns. The World Health Organization (WHO) responded to the call by the Sudan government for support by sending a team of epidemiologists and doctors to investigate. The team from Sudan who participated in the investigation from the Ministry of Health in Juba were Dr Isaiah Mayom Deng, Dr Oliver Duku, Dr Anthony Lagu Gillo, Dr Pacifico Lolik, Dr William Renzi Tembura and Dr Noel Loo Warille. Two colleagues joined the team from the Ministry of Health in Khartoum: Dr Babiker el Tahir and Dr Ali Ahmed Idris^[1].

It was quickly established that it was a new disease. The focus was found to be a cotton factory in Nzara and those closely related to the patients were the most at risk due to close contacts. By the end of the period, there were 284 cases; 67 in the source town of Nzara, 213 in Maridi, 3 in Tombura, and one in Juba^[1]. Unbeknown to them, a similar outbreak was taking place in the DR Congo (formerly Zaire) in a place called Yambuku. Although initially thought to be the same outbreak, it was later established that the strains of the virus were different, subsequently named Sudan and Zaire strains. These were the first outbreaks of what became known as Ebola Virus Disease (EVD) - see EVD overview on page 100.

South Sudan went on to experience two more outbreaks in 1979^[2] and 2004^[3]. Uganda and DR Congo have had several outbreaks of EVD as well. The most devastating outbreak of EVD was the West African outbreak in Guinea, Liberia and Sierra Leone starting in 2014. It was the first outbreak in the region and by May 2016 there were 28,616 suspected cases reported and 11,310 deaths^[4].

Although South Sudan has been spared a serious outbreak for decades, the emergence of EVD in the DR Congo in 2018 is a cause for concern. It requires vigilance and constant surveillance preparedness. The establishment of a national task force by the Ministry of Health (MoH) in South Sudan with support from WHO and partners is a step in the right direction (see "Ebola on our doorstep" page 103). The capacity for early detection and response is key in dealing with EVD. South Sudan will continue to be at risk for a long time to come and the MoH will have to be ready in case of an outbreak.

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The capacity for early detection and response is key in dealing with Ebola Virus Disease

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Knowledge of type 2 diabetes mellitus and adherence to management guidelines: a cross-sectional study in Juba, South Sudan

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Introduction: In South Sudan, inadequate education and the lack of efficient diabetes care centres compounded by high costs are common barriers for diabetes care.

Objective: To assess the level of knowledge and adherence to guidelines for management of type 2 diabetes (T2D) and detect associations between knowledge scores and HbA₁C levels.

Method: A cross-sectional study among 176 participants aged from 20 to 79 years with T2D randomly selected in Malakia Diabetic Clinic, Juba from July to September 2017.

Results: The proportions of "poor", "average", and "good" scores for knowledge were 58%, 18% and 24%, respectively. Fewer than half of the patients had had retinal check-ups (46.6%), HbA₁c tests (44.3%), lipid measurements (37.5%), dental examinations (20.5%) and renal function reviews (10.2%) in the last year.

Conclusion: There was poor knowledge and low adherence to diabetes management guidelines. This study highlights the significance of educational intervention and implementation of diabetes management guidelines in South Sudan.

Keywords: Type 2 diabetes; knowledge; adherence to guidelines; self-management; South Sudan

INTRODUCTION

South Sudan is one of the world's youngest nations with extreme poverty and poor healthcare provision. Diabetes mellitus (DM) has steadily increased across the country in recent years and currently has a prevalence rate of 11.8% ^[1].

Diabetes is an expensive disease to treat because of the range of complications which exerts a tremendous economic burden on patients, families, health systems and society as a whole ^[2]. Knowledge of DM and adherence of physicians and patients to management guidelines are crucial for the reduction of complications and improved health outcomes. Management requires clear instruction from both doctors and nurses, and the patients making various life style choices ^[3].

No studies in the country have specifically examined to what extent the diabetes management guidelines are being followed. This small cross-sectional study evaluated the knowledge of, and adherence to, clinical guidelines of patients with type 2 diabetes (T2D), and detected associated factors.

METHODOLOGY

This descriptive cross-sectional study design used primary data that were collected from 176 adults with T2D in the Malakia Diabetic Control Centre of Juba City between July and September 2017. A three-part questionnaire was used: Part I consisted of general characteristics of patients, Part II related to knowledge about different aspects of diabetes and general principles of disease care and Part III collected data on patients' self-management of diabetes for annual follow-up criteria as reported in guidelines. The guidelines' criteria were extracted from international guidelines ^[4-6]. The questionnaire about knowledge was developed and adopted from the Michigan Diabetes Training Centre Diabetes Knowledge Test (DKT) as a guide for primary data collection^[7].

Data were analysed using Statistical Package for Social Sciences (SPSS) version 24. Descriptive statistics (frequencies and percentages) were used to describe the general characteristics. The level of adherence to criteria, i.e. the number of criteria achieved, was calculated for each criterion in percentage terms. The knowledge scores and HbA₁C levels were compared with general information

Table 1. Characteristics of the study subjects (n = 176)						
Characteristic	n	%				
Age (years, mean±SD)	52.6±11.1					
Age category						
<40	19	10.7				
50 - 40	58	33.0				
60 - 51	61	34.7				
>60	38	21.6				
Gender						
Male	85	48.3				
Female	91	51.7				
Education level						
No formal education	62	35.2				
Primary education	39	22.2				
Secondary education	50	28.4				
Post-secondary education/degree	25	14.2				
Employment status						
Employed	114	64.8				
Unemployed	62	35.2				
Monthly income (190 South Sudan Pour	nds (SSP) =	= 1US\$)				
<ssp 1000<="" td=""><td>102</td><td>58</td></ssp>	102	58				
SSP 2000 – 1001	38	21.6				
>SSP 2000	36	20.5				
Duration of diabetes (years, mean±SD)	6.9±5.7					
<2 years	30	17				
2-5 years	57	32.4				
>5 years	89	50.7				
Family history of DM						
Present	65	63.1				
Absent	111	36.9				
Body Mass Index (BMI) (mean±SD)	25.6±5.1					
Underweight: BMI < 18.5	10	5.7				
Normal: BMI 18.5 - 25	70	39.8				
Overweight: BMI 25 - 30	67	38.1				
Obese: BMI ≥ 30	29	16.5				
Smoking habit						
Yes	27	15.3				
No	149	84.7				

variables and management practices using an independent sample t-test and ANOVA. The means and standard deviations were calculated and a p-value of 0.05 or less was considered statistically significant.

RESULTS

The level of adherence to criteria varied among the study participants. In the past year fewer than half of respondents had had eye examinations 46.6% (n=82), HbA₁c tests 44.3% (n=78), lipid tests 37.5% (n=66), dental checkups 20.5% (n=36) and renal check-ups 10.2% (n=18) (Figure 1.A). Almost 40% (n=69) were not using oral anti-diabetic medication or insulin (Figure 1.B). Only 1.7% (n=3) were following physical activity guidelines (Figure 1.C); 30.1% (n=53) were always following the dietary recommendations (Figure 1. D).

Only 78 (44.3%) patients had been tested for HbA₁C within last four months and only their results were used to compare their adherence to DM management guidelines. The mean HbA₁C differed significantly according to whether respondents were taking neither oral antidiabetic medication nor insulin, not undertaking vigorous physical activity and habitually not following diet recommendations. Insulin, 150 minutes/week of exercise and always following diet recommendations for diabetes were significantly associated with lower or normal HbA₁C values (p < 0.01) (Table 2).

More than 50% of patients showed poor knowledge (58%, n=102), 24% (n=42) expressed good knowledge and 18% (n=32) exhibited moderate knowledge (Figure 2).

The knowledge score was unaffected by the duration of diabetes and family history of diabetes. However, subjects younger than 40 years had significantly higher knowledge scores than those older than 60 years (P = .022). Similarly, subjects with post-secondary education or degrees had significantly higher knowledge scores than those with secondary education or less (P=<0.001). Participants with normal HbA₁C (6.5) had significantly higher knowledge scores than subjects with HBA, C results >6.5 (P=<0.001). (Table 3).

DISCUSSION

Diabetes is a demanding disease requiring much patient self-management. This study highlights a critical situation in South Sudan, a country without official guidelines for the management of diabetes. Evidence suggests that knowing the facts about diabetes and adherence of patients to guidelines have a significant effect on control of the disease. One of the objectives of this study was to assess the level of knowledge among T2D patient: 58% of whom showed poor knowledge. This was associated with a low level of education among participants. Our study observed that higher educational backgrounds were associated with gradually increasing knowledge scores - a



 $HbA_{l}C = glycosylated baemoglobin$

Figure 1. Level of adherence according to the criteria for type 2 diabetes follow-up (% of patients)

finding similar to that from Bangladesh^[8]. However this is in contrast from a Kenyan report which found very low levels of knowledge (27%)^[9]. Our study discovered that knowledge was associated with age: age under 40 years was significantly associated with better knowledge regarding diabetes compared to those aged over 40 years. This matches findings from Ethiopia^[10]. This indicates that older people are at a higher risk and may need targeted programmes for their care.

Exercise duration

Concerning the adherence to recognised guidelines we

found 28%, 27%, 46.6%, 10.2% and 20.5% of the patients had had at least one HbA₁C test, lipid profile, retinal, renal and dental check-up respectively in the last year which agree with previous Sudanese data in 2015: 22.9%, 17%, 9.2% and 14.1% ^[11].

Following diet

Recommendations for the frequency of HbA_1C measurement range from twice to four times annually ^[6]. This study found a strong inverse association between knowledge scores and HbA_1C levels; the HbA_1C level was lower with each one-unit increase in knowledge score.

Characteristic	Category	HbA1C level (mean±SD)	Р
Diabetes medication	Oral anti-diabetic (n=22) Insulin (n=4) Neither oral nor insulin (52)	6.47±2.89 ^b 5.90±3.14 ^c 12.22±3.14 ^a	<0.01
Following diet recommendations	Always (n=22) Sometimes (n=15) Never (n=41)	6.20±2.82° 8.87±2.87 ^b 10.93±2.69 ^a	<0.01
Exercise duration/week	No exercise (n=69) 90-120 min./wk. (n=8) ≥150 min./wk. (n=1)	10.42±2.88 ^a 9.67±2.40 ^a 5.20±0.00 ^b	<0.01

Table 2. HbA₁C level in patients with different medication, diet and exercise (78 patients)

* Note: different letters (a, b or c) indicate statistical significance (P<0.05) among groups. SD=standard deviation.

Almost 50% of respondents were not following diet recommendations. Also, the finding of a statistically significant association between HbA_1C levels and diet for T2D is as predicted.

This study found that patients who undertook vigorous activity had normal HbA₁C levels compared to patients who undertook no physical activity, which was inconsistent with Bouléet et al ^[12]. Physical activity has the greatest effect to minimize diabetes complications and reducing weight. Our study suggested some barriers to exercise adherence such as lack of motivation and convenience and weather. Another barrier is that South Sudanese adult population are less inclined to engage in physical activity.

CONCLUSION

Knowledge about diabetes mellitus and adherence to guidelines and recommendations are important drivers for controlling the disease and reducing risks of complications and death. Thus, this study emphasises the importance of implementation of guidelines in South Sudan and education of communities and physicians, with a view to to improved management of the disease.

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Conflict of interest: The authors declare that there is no conflict of interest.

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Figure 2. Distribution of participants according to their levels of knowledge of diabetes

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Characteristic	Category	Knowledge score (mean±SD)	Р
Age	<40 years (n=19) 40 – 50 years (n=58) 51 – 60 years (n=61) >60 years (n=38)	8.47±3.72 ^a 3.72±3.59 ^c 4.84±3.63 ^b 3.84±3.71 ^c	.022
HbA ₁ C	≤6.5 >6.5	9.43±3.86ª 4.30±3.54 ^b	<0.01
Education level	No formal (n=62) Primary (n=39) Secondary (n=50) Post-sec./degree (n=25)	1.68±2.25 ^d 3.23±3.09 ^c 6.38±30 ^b 9.24±.53 ^a	<0.01
Duration of diabetes	<2 years (n=30) 2–5 years (n=57) >5 years (n=89)	4.70±3.89 4.37± 3.71 4.38±3.75	.911
Family history of diabetes	Present (n=65) Absent (n=111)	4.77±3.78 4.23±3.70	.358

Table 3. Knowledge scores of the study participants according to different variables

* Note: different letters (a, b or c) indicate statistical significance (P<0.05) among groups. SD=standard deviation.

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Knowledge, attitude and willingness to accept Caesarean Section among women in Ogbomoso, southwest Nigeria

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Introduction: Caesarean section (CS) is a common procedure in obstetrics and has contributed immensely to improving maternal and foetal outcome; there are still concerns about the knowledge, attitude and willingness to accept the procedure among women especially those in the developing world.

Objective: This study seeks to assess the level of knowledge, attitude and acceptance of women about CS in Ogbomoso. These women were more educated than most of their counterparts in South Sudan but because of the political situation we are unlikely to get similar data from South Sudan and therefore this study is of interest.

Methodology: This is a descriptive study which was carried out in four health facilities. Respondents were selected using the systematic random technique with a sample interval of 2. A semi-structured questionnaire was used for data collection. Data were analysed using the statistical package for social sciences (SPSS), version 16.

Results: Of the 410 respondents, 63.2% of the women have a good knowledge of CS as a method of delivery. When CS was compared to vaginal delivery, 33.5% said that CS was preferable to vaginal delivery because the pain involved was much less; this view was however disagreed upon by 54.8% of the respondents. Only 75.6% of the respondents were ready to accept CS if there was a need for it.

Conclusion: Mothers should be educated on the process involved in Caesarean delivery, the indication, advantages and complications in order to help them make the right informed decision.

Key words: Women knowledge, attitude, Caesarean section, Nigeria

INTRODUCTION

Caesarean section is a surgical procedure which involves incisions made through a mother's abdomen (laparotomy) and uterus (hysterectomy) to deliver one or more babies or to remove a dead foetus. Compared to the consequences of, for example, an obstructed labour, CS is safe for both the mother and baby and it is the most commonly performed obstetric operation. There are some risks such as accidental damage to the woman's bladder or bowel and an increase in the incidence of breathing difficulties in the baby. These should be explained to the woman as part of preparation for surgery.

While the experience of some women as it concerns pregnancy and delivery is very pleasant others have hazardous experiences ^[1]. Most of the deaths of pregnant women occur in low resource settings and are largely preventable ^[2]. It has been postulated that increased access of women to CS may decrease maternal mortality rate by as much as 92% ^[3]. Nevertheless, the World Health Organization have noticed that the CS rate in many countries have continued to be on the rise despite the advice to keep the rates low ^[4]. Factors influencing the rise include safer anaesthesia and fear of litigation.

In developing countries, women and those who make decisions for them such as husbands, mothers in law and local authority figures are reluctant to accept CS because of the traditional beliefs and sociocultural norms. Some women even see delivery by CS as reproductive failure on their part ^[5]. As a result of these they engage untrained and unskilled providers, they only report to the hospital when life threatening complications set in ^[6].

A literature search revealed a positive correlation between CS rate and level of education of women. However, there is an aversion for CS among women ^[7, 8]. Overall, women prefer vaginal delivery to CS ^[9]. In a study in Ghana on the awareness, perception and attitudes of women towards CS, it was observed that 93.3% of clients preferred vaginal delivery to CS. Nevertheless, majority of these women

(98.1%) wanted CS to be part of antenatal care education $^{[10]}$.

The objective of this study was to determine the level of knowledge, attitude and acceptance of Caesarean section among women in Ogbomoso, south west Nigeria

METHODOLOGY

This was a descriptive cross sectional study carried out in four health facilities in Ogbomoso which is a major semi-urban town. Respondents were selected using the systematic random technique. Participation in the study was voluntary. Inclusion criteria were any parous woman, while the exclusion criteria includes refusal to participate in the study and any woman with history of primary infertility. An interviewer used a semi-structured 4-section questionnaire:

- Section A; sociodemographic characteristics,
- Section B; knowledge of the respondents on CS,
- Section C; attitude of respondents to CS,
- Section D; willingness to accept CS if indicated.

A scoring system was developed for the level of knowledge of the respondents, correct answers attracted 2 marks and incorrect answers 1mark. The total score was categorized as good knowledge>70%, fair knowledge 50-69% and poor knowledge <49%. Data were analysed using SPSS 16.

RESULTS

A total of 410 questionnaires were completed and analysed. The majority of respondents were between the ages of 25-34 years (Table 1); 278 (68.5%) had acquired a tertiary level of education, this accounted for the most common attained level of education amongst the respondents (Table 1).

Majority of the respondents had a good knowledge of CS (Table 2). A further analysis of the association between the level of knowledge about CS and level of education of the women revealed a significant statistical relationship (p<0.05). Most women with tertiary education had a better knowledge of CS when compared with their counterparts in the other categories (Table 3).

As it concerns the perception of these women about CS and its safety, 164 (40.1%) of the respondents agreed that CS was as safe as vaginal delivery, while 200 (48.9%) disagreed. The rest of the respondents were indifferent in their perception as it concerns the different modalities of delivery.

When CS was considered necessary as a method of delivery, 309 (75.6%) of the respondents were willing to accept CS if the need arose while 100(24.5%) indicated that they will be unwilling to do so irrespective of the circumstance.

Sociodemographic variable	n	%
Age years:		
15-19	4	0.99
20-24	97	24.1
25-29	102	25.3
30-34	107	26.6
35-39	65	16.1
>40	28	7.0
Ethnicity:		
Yoruba	388	94.6
Igbo	11	2.7
Hausa	2	0.5
Others	9	2.2
Marital status:		
Unmarried	96	23.4
Married	314	76.6
Divorced	0	0
Religion:		
Christianity	337	82.2
Islam	69	16.8
Traditional	4	1.0
Level of Education:		
Primary	24	4.9
Secondary	106	26.1
Tertiary	278	68.5
No formal education	2	0.5

Table 1. Respondents' sociodemographic variables

Table 2. Knowledge of Caesarean section

Level of knowledge	n	%
Good	259	63.2
Fair	99	24.1
Poor	52	12.7
Total	410	100

DISCUSSION

This study revealed that majority (63.2%) of the respondents had a good knowledge of CS. This may be because most of the respondents had some form of education - 68.5% had tertiary level of education. The study also clearly demonstrated that the higher the level of education, the better the inclination of women to

Education level/ Level of knowledge	Good	Fair	Poor
	n (%)	n(%)	n(%)
Primary Education	9(3.5)	7(7.1)	4(7.7)
Secondary Education	53(20.5)	38(38.4)	15(28.8)
Tertiary Education	194(74.9)	52(52.5)	32(61.5)
No formal Education	3(1.1)	2(2.0)	1(2.0)
Total	259(100)	99(100)	52(100)

Table 3. Respondents knowledge of Caesarean section bylevel of education

accept CS when necessary. This finding is similar to that demonstrated in a study which revealed that low level of acceptance of CS was common in women of the lower educational class ^[11]. Our observation from this study was that majority refused to accept CS for religious reasons as they perceive it as a means of delivery in women with suboptimal level of faith. Other reasons for refusal were the desire to experience vaginal delivery, a similar observation was found in a previous study ^[12].

Due to the greater number of respondents being educated, it was observed that the majority (75.5%) were willing to have CS if indicated, this was however contradictory to the observation among other Nigerian women ^[6,13]. Nevertheless, it should be noted that CS acceptance rate was higher than the average in most of the conducted studies ^[14,15].

Although efforts are being made to lower the CS rate, when the need arises it may be refused by some women due to poor knowledge and negative attitude towards CS. As it was observed in our study 100 (24.5%) respondents were unwilling to have CS irrespective of the indication and the circumstance that may necessitate it. Common reasons for this were that CS was perceived to be for the rich, while others considered it very unsafe; others felt that delivery via CS would make them unfulfilled as women. From the observations above, one in every four women will refuse CS when needed. A critical look at this indicates the burden it may pose to increasing maternal and foetal morbidity and mortality.

CONCLUSION

Women need to be properly educated and empowered to take appropriate decisions as it concerns their health during the birth process. The existing trend can be improved when health care givers provide health education and proper counselling during antenatal care. Non-governmental organizations can help with improved education, campaigns and awareness on birthing process as it concerns CS. In particular it should be made clear that the need for intervention is not the result of the beliefs or behaviour of the woman in question. Governments can assist in providing quality affordable education for the girl child. Efforts should be made at all levels to reach out to religious and traditional organizations and leaders to assist in improving the dearth of knowledge as it concerns CS in the community.

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Caesarean Section acceptability and rate in South Sudan

Women may refuse or be reluctant to have a planned or unplanned Caesarean Section (CS) for many reasons. A knowledge of these reasons can help health professionals to persuade a woman and, as importantly, her relatives to agree to a CS if the need arises.

The article on page 89 reports on the knowledge, attitude and willingness to accept CS among women in southwest Nigeria, and gives references to similar studies in other parts of West Africa. There appear to be few studies in eastern or central Africa, including South Sudan (although data from South Africa^[1] and immigrant Somali women in US^[2] indicate negative attitudes).

The most common indicator for CS in Africa is obstructed labour. If not treated promptly by an emergency CS, obstructed labour may lead to vesico-vaginal fistulae (VVF) in the mother or end in maternal/neonatal deaths (see article on page 93). Thus, the alternative to not doing a CS is worse for the mother and baby, although the complications of CS itself cannot outweigh the safety of the dyad.

There is no comprehensive data on the rate of CS or its acceptance rate among women in South Sudan. Globally, World Health Organization (WHO) has expressed concern about the rise in CS rates. Its statement emphasized that "Every effort should be made to provide Caesarean Sections to women in need, rather than striving to achieve a specific rate"^[3].

SSMJ is interested in publishing valid information on the perception of CS from South Sudanese women and their families.

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Obstetric fistulae, birth outcomes, and surgical repair outcomes: a retrospective analysis of hospital-based data in Dodoma, Tanzania

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Introduction: Obstetric Fistula (OF) among pregnant women remains a widespread condition with devastating consequences and poses a significant challenge in a community as well as globally.

Objective: To determine the predictors and contributing factors associated with OF and birth outcomes in women undergoing fistula repair at the Dodoma Regional Referral Hospital (DRRH).

Method: This retrospective study used hospital records of women repaired over 2013 and 2014. Data were analysed using SPSS version 21 for Window (SPSS Inc., Chicago, IL, USA). Frequency tables were generated and bivariate analyses were conducted to determine the contributing factors associated with OF using chi-squared statistics.

Results: Fifty two women underwent surgical repair of a fistula; 47(90.2%) were primiparous and 5(9.6%) multiparous. There were 42(80.8%) vesico-vaginal fistulae (VVF), and 10(19.2%) recto-vaginal fistulae (RVF). Of those with VVF 5 (9.6%) had been living with urine leakage for 10 years, 25 (48.1%) for 17 years, and 12 (23.1%) for 20 years; all 10 (19.2%) with RVF had been living with the defect for 10 years. No patient had been living with both vaginal and recto fistulae.

Most of the fistulas were associated with prolonged difficult spontaneous vaginal delivery but two were associated with surgery: Caesarean Section and hysterectomy.

Surgical repair was by the transvaginal 47(90.4%) and trans abdominal 5(9.6%) routes. Female genital mutilation (FGM) was found in all the 28 women from the Gogo tribe but only in 12 of the 24 women from other tribes.

Conclusion: Timely fistula repair by experienced fistula surgeons, adhering to fastidious basic surgical principles, will improve outcomes and limit the clinical insult and distress that OF invariably causes.

Keywords: obstetrics fistula, recto-vaginal fistula, vesico-vaginal fistula, surgical repair, female genital mutilation, Tanzania.

INTRODUCTION

Obstetric fistula (OF) is a devastating pregnancy-related disability which affects an estimated 50,000 to 100,000 woman each year ^[1]. OF is a global problem, but is more common in Africa especially sub-Saharan Africa and South Asia ^[2]. The World Health Organization estimates that approximately 2 to 4 million women live with OF worldwide, with more than 1.5 million in sub-Saharan Africa ^[3].

This results in prolonged pressure of the baby's head against the mother's pelvis which cuts off the blood supply to the entrapped soft tissues; this leads to tissue necrosis and can involve the bladder, rectum, and vagina. The outcome is usually the death of the baby and OF in the mother ^[4]. In developed countries with good obstetric care OF has been completely eradicated ^[5].

The objective of the study is to determine the predictors and contributing factors associated with OF in women undergoing fistula repair at Dodoma Regional Referral Hospital (DRRH).

METHOD

The hospital records of 52 women whose fistula had been repaired between January 2013 and December 2014 were examined.

Data were analysed using SPSS version 21 for Window

Table 1. Socio characteristics of the enrolled patients (n=52)

Characteristics	n (%)
Age years	
Less than 35	30(57.7)
More than 35	22(42.3)
Education	
None - Primary education	49(94.2)
Secondary - highest education	3(5.8)
Occupation	
Peasants	50(96.2)
Small business	2(3.8)
Residence	
Rural	50(96.2)
Urban	2(3.8)
Marital status	
Married	15(28.8)
Divorced	30(71.2)
Others	7(13.5)
Tribe	
Gogo	28(53.8)
Other	24(46.2)
Mode of delivery	
Spontaneous Vaginal Delivery	45(86.5)
C-Section	7(13.5)
Vulva visual inspection	
With FGM	40(76.9)
Without FGM	12(23.1)

Table 2. Obstetric history and fistula outcome

Obstetrics history and fistula outcome	n(%)
Parity status	
Primipara	47(90.4)
Multipara	5(9.6)
Years of living with injury/defect	
For 10 years	5(9.6)
For 17 years	25(48.2)
For 20 years	12(23.1)
Duration of faecal vaginal leakage	
Up to 10 years	10(19.2)
Cause of fistula	
Prolonged obstructed labour	50(96.2)
Emergency Caesarian Section	1(1.9)
Hysterectomy	1(1.9)
Duration of labour	
Up to 24 hours	12(23.1)
24 - 48 hours	40(76.9)
Child outcome post delivery	
Died	20(38.5)
Survived	32(61.5)
Type of fistula	
Vesicle Vaginal	42(80.8)
Recto Vaginal	10(19.2)

(SPSS Inc., Chicago, IL, USA). Frequency tables were generated and bivariate analyses were conducted to determine the contributing factors associated with OF using chi-squared statistics.

The University of Dodoma Research Committee approved the study and permission was received from the DRRH authorities.

RESULTS

Table 1 shows the age, education, occupation, residence, marital status and tribe of the 52 patients at time of the OF repair.

Of the enrolled patients 47(90.4%) were primipara and 5(9.6%) were multipara. Table 2 shows the duration of

urine leakage, cause of the fistula, and duration of labour and outcome for the baby.

Table 3 shows that transvaginal repair was the commonest route of repair - 47(90.4%) women - compared with 5(9.6%) having a trans abdominal repair. The commonest surgical suture materials used were vicrly number 3/0 and 2/0.

Repair of the fistulae it was done through the posterior wall of the vagina apart from three cases of base of the bladder fistulae and the two surgical injuries. These five were accessed abdominally.

After surgical repair 5 women (9.6%) had postoperative wound sepsis, 45(86.5%) had a negative dye test and 7(13.5%) a positive dye test (Table 4).

Table 5 shows the association between the variables related to OF and birth outcome. The deaths of all the babies delivered by C-Section were due to prolonged obstructed labour leading of massive head entrapment and causing foetal asphyxia.

DISCUSSION

The high prevalence of OF in Africa is due to poor/ underdeveloped reproductive health services, individual illiteracy and community unawareness toward seeking health services ^[6]. Early marriage accounts for a high proportion of all pregnancies in developing countries. Studies show that OF tends to occur in first pregnancies often following teenage marriages; at this age the teenagers are at high risk of getting complications during and after delivery. Women often delay seeking medical help and live with OF for a long time even into advanced old age. This may be because of social stigma, a poor quality of life and/or lack of education preventing them seeking medical help ^[7].

Table 3. The surgical repair and perioperative characteristics among obstetric fistula-repaired women

Characteristics	n(%)				
Route of repair					
Transvaginal	47(90.4)				
Transabdominal (ureteric and bladder base injuries)	5(9.6)				
Type of anaesthesia					
Spinal	49(94.2)				
Saddle block	3(5.8)				
Antibiotics given					
Preoperative	43(82.7)				
Post-operative	9 (17.3)				
Postoperative characteristics					
Duration of continuous bladder drainage					
Self-retaining catheterization - 14 days	47(90.4)				
Self-retaining catheterization - 21 days	5(9.6)				
Postoperative wound sepsis					
Yes	5(9.6)				
No	47(90.4)				
Haemoglobin level checked					
Yes	49(94.2)				
No	3(5.8)				

Studies done in Tanzania show that there are 1200 to 3000 new cases of OF each year; the contributing factors are lack of accessible care at dispensaries, health centres and hospitals so that women have to deliver at home ^[8].

The high rates of primipara in our study (90%) suggest that in order to reduce OF, one target for education on family planning should be teenagers and their families. In Zambia only 49% of women with OF were primipara^[9].

In Tanzania the prevalence of FGM is 15% ^[10]; our study

Table 4.	Post	obstetric	fistula	surgical	repair	

Surgical repair outcome	n (%)						
Vesicle vaginal fistula closure							
- Successful: Negative dye test	35(83.3)						
- Unsuccessful: Positive dye test	7(16.6)						
Total	42						
Post Recto vaginal fistula repair and anal sphincter reconstruction							
- Successful repair	10(100)						
Total	10						

Table 5. Factors related	to birth	outcome	among	women
with obstetric fistulae				

	Survived		Died			
Variables	n	%	n	%	P-value	
Mode of delivery:						
SVD	20	44.4	25	55.6	-0.025	
CS	0	0(0.0)	7	100	<0.025	
Duration of labour:						
Up to 24 hours	0	0.0	12	100	<0.001(***)	
24 - 48 hours	20	50	20	50		
Parity:						
Primiparous	19	40.4	28	59.6	<0.000(***)	
Multiparous	1	20	4	80		
Tribe:						
Gogo	20	71.4	8	28.6	<0.000(***)	
Other	0	0.0	24	100		
Genital Mutilated:						
With FGM	20	50	20	50	<0.000(***)	
Without FGM	0	0.0	12	100		
Education Level:						
None–Primary	20	40.4	29	59.6	<0.224	
Secondary–High	0	0.0	3	100		

area is among the geographical regions with a high rate of FGM. However the increased risk of both recto and vaginal fistula from FGM is still controversial ^[11]. In this study the Gogo were the tribe that seemed to have a high risk of fistula. The Gogo perform both clitoridectomy and the excision type of FGM, types that are probably not associated with the risk of OF. A similar study done in Ethiopia showed no association between FGM and risk of fistula ^[12].

However, the type of circumcision related to causing OF is still in doubt. Most studies have reported observational studies rather than clinical trials. These seem to indicate that FGM is associated with a significant risk of VVF and RVF^[13]. On the other hand, a study in Somalia showed that the Infibulation type of FGM was the direct cause of prolonged obstructed labour rather than clitoridectomy and excision^[14].

The Kuria in Mwanza is the only tribe that specifically performs clitoridectomy and similar rates of OF to that of the Kuria was observed among other tribes in Tanzania not practicing clitoridectomy. Therefore factors other than FGM should be considered when examining the risks of OF ^[15].

RECOMMENDATIONS

To prevent OF there needs to be increased awareness, through community education, of the dangers of prolonged labour especially among families of pregnant teenager girls and other primipara. The partogram should be seen as an important tool at all health facilities.

The social stigma of OF needs to be eradicated so that a woman with a fistula (whatever her marital status) can seek treatment early.

Skilled surgical personnel should be available to all health facilities for the intermediate and late surgical repair for both RVF and VVF.

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How to repair a vesico-vaginal fistula

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INTRODUCTION

It is not possible to describe in a short article how to repair a vesico vaginal fistula (VVF) as this is a large and complex subject. So, I will just give a brief overview and refer the reader to resources that cover the practical aspects of the surgery and holistic care of the patient.

The tragedy of obstetric fistula is that it is entirely preventable, if only there was access to quality obstetric services everywhere.

Most fistulae are caused by ischaemic necrosis of the genital tract and adjacent organs through prolonged obstructed labour (Figure 1). Increasing numbers are due to operative damage to the bladder or ureter at Caesarean Section, emergency hysterectomy for ruptured uterus and elective hysterectomy. Another cause of VVF is sexual violence particularly in war conflict situations.

It is estimated that three in 100 pregnant women will develop obstruction in labour in tropical Africa. In societies where under-age marriage is common (e.g. Ethiopia) many girls become pregnant before the pelvis has fully developed. This has given the impression that fistula is a condition affecting principally primipara but it is just as common in multiparous women. A few women reach hospital in time for a live baby to be delivered by Caesarean Section, but others arrive too late to save the baby and yet others, especially multipara, have ruptured their uterus. About one in 10 women developing obstruction will end up with a fistula, thus the best estimate is an incidence of one fistula for every 300 deliveries. This should be seen against a background of the appalling lifetime risk of death in pregnancy of 1:20 in sub-Saharan Africa. There is an enormous backlog of unrepaired cases of fistula in Africa.

Prevention is the long-term goal, so it is important to understand the reasons why these fistulae occur.

In most of Africa, more than half the women deliver at home without expert help. Fewer have access to good antenatal care where risks can be assessed (e.g. small stature) and hospital care advised.

There can be three stages for delay in receiving appropriate care:

1. When complications in labour develop at home, they are recognised too late.



Figure 1. The area in blue is most damaged by the pressure of obstructed labour (Credit Brian Hancock).

- 2. After a decision is made by the family or traditional birth attendant that help is needed, there is delay accessing transport. It may be costly, and funds have not been set aside. A medical centre may be remote and even several days journey away.
- 3. Even when a hospital is reached there may be unacceptable charges or delays in performing a Caesarean Section. This could be because of the volume of cases, as at some teaching hospitals, and lack of, or inadequately, trained staff at many rural hospitals

In summary fistulae will only be eliminated, as they have been in the developed world, when women and their families are better educated about the advantages of antenatal care and skilled attendance at delivery and have access to them (Figure 2). Women need more empowerment to act in their own interests rather than have decisions made by members of the family. There must be better emergency transport infrastructure to wellequipped and well-staffed hospitals. While small steps are being made in the right direction there remains a large backlog of cases to repair and a steady stream of new cases.

MANAGEMENT

Management of obstructed labour is by Caesarean Section carried out as soon as possible.



Figure 2. The most important message (Credit Brian Hancock).

A urinary catheter should be left in the bladder for at least 10 days after a Caesarean for severe obstruction. This may prevent a fistula from forming, but if urine leakage appears through the vagina the catheter should be retained for at least six weeks on continuous drainage. If the fistula is judged to be large there is no point in persisting but a small fistula under 1cm has a high chance of healing if the bladder is kept empty. If this advice was followed the incidence of fistula could be reduced by up to 20%.

It cannot be over-emphasized that a fistula patient has more than just a hole in the bladder. The whole person is damaged by the disastrous outcome of obstructed labour. She has almost certainly lost her baby and often her partner and may be treated as an outcast by her community. Depression is understandably common, and she may have foot drop or even severe paralysis with contractures from ischaemia to the lower limb nerves as they pass though the pelvis. For several reasons she may have difficulty reproducing again even if surgery has closed her fistula.

Patients should be treated in a centre that is familiar with all aspects of care. Team work is essential; those who operate on large numbers of fistula undoubtedly get the best results.

SURGICAL REPAIR

It must be clearly understood that the first operation carries the best chance of success so unless one is fully familiar with the problem any temptation to "have a go" at repair should be strongly resisted. A badly performed and failed repair makes a second attempt much more difficult.

In contrast to even a decade ago, almost all African countries have hospitals where experts are operating either as visiting surgeons or increasingly as national residents.

It is essential that doctors working in developing countries find out where these centres are, either through local contacts or through contact with international organizations.

There is an enormous range of fistulae - from pin hole in



Figure 3. Types of fistula. The worst damage is usually at the uretero-vesical junction (Credit Brian Hancock).



Figure 4. The worst type of fistula. Note the bladder is completely detached from a stenosed urethra (Credit Brian Hancock).

the mid vagina to total destruction of the bladder base and anterior vagina together with severe scar tissue (Figures 3 and 4). Primipara, who deliver vaginally, suffer the most damage. They have the highest incidence of urethral and rectal damage. Although the fistula can be closed in most patients some may still be wet because of the severe urethral damage. Multipara, especially those having been eventually delivered by Caesarean Section, tend to have fistulae higher in the genital tract in the region of the cervix. They do have a better prognosis though the fistula may be challenging to close. It is usual to wait about three months after the injury before doing the repair.

A beginner at fistula surgery should only operate on the smallest most accessible fistulae. Unfortunately, this is only about 20% of cases, as shown in the mid-vaginal fistula in Figure 3. It should be greater than 3.5 cm from the external meatus, is less than 2cm diameter, is mobile, not scarred and finally is not too close to the cervix. In these latter cases the ureteric orifices are at risk unless identified or preferably catheterized.

The complexity of cases varies enormously: 25% are reasonably simple, 50% present a variety of technical challenges and the final 25% can be extremely challenging to cure.

Results of surgery

Even experts cannot cure every case; in about 1 in 50 cases there is too much damage to even attempt a repair. The most experienced surgeons claim that 95% of fistulae can be closed though they may have to operate on up to 10% of patients for a second or third time to achieve this figure. Closure of the fistula, is not the same as cure. Some 15–20% will have severe stress incontinence because the urethra and bladder have been so badly damaged. A few may improve in time, but, for those who do not, the operation has failed. Secondary operations for stress incontinence are possible but have uncertain results. A reasonably experienced surgeon who takes on almost all cases seen can at best probably only make 65–75% dry.

A novice surgeon should have the same closure rate as an expert (i.e. at least 90%). This is because he or she should only be operating on the less damaged cases. If below this figure there is a problem with selection or surgical skill.

Anyone who watches a master fistula surgeon at work will marvel at the ease with which he or she demonstrates the art of fistula surgery. Even experienced surgeons who come new to fistula surgery will be surprised at how demanding the operations are and how difficult they seem at the start. The distorted anatomy and rigidity of tissues come as a shock. One not only has to know what must be done but also have the skill to do it. Accurate dissection and suturing in a confined space is difficult and requires more than average manual dexterity. There is a long learning curve owing to the complexity of many cases, and experience can only be gained by hands-on work and regular visits to work with a more experienced surgeon.

The technical aspect of repairing fistulae has been largely worked out, the challenge remains to train more surgeons and co-workers and provide the facilities where they may be safely repaired.

Post-operative care

Nursing care is equally important as the surgery and is simple provided certain basic principles are observed. It is the surgeon's responsibility to be familiar with and to supervise all aspects of pre- and postoperative care.

Continuous bladder drainage for about 10 days is advised for simpler cases. Many prefer open drainage into a bucket, there is less to go wrong. At all times the patient must be Dry, Drinking and Draining. A blocked catheter is an emergency as an over full bladder may burst the repair. The commonest cause is kinking of the drainage tube or catheter. Fluids should be taken liberally to ensure a good flow of dilute urine and to lessen the chance of catheter blockage and urinary infection. A wet bed must be investigated by inspection or a dye test as this may confirm a breakdown.

If it occurs in the first week of repair the prognosis is not good. But later small breakdowns may still heal with prolonged bladder drainage.

Repairs can be done again after an interval of three months but with each repair the prognosis is less good.

After removal of the catheter preferably preceded by a dye test the patient should not go home immediately. A few develop a degree of retention which predisposes to breakdown after going home. Emptying should be checked by measurement of residual urine before going home. In the event of large residual, the catheter must stay in longer till the bladder has recovered. The patient should be advised to avoid sex for at least three months and must attend for a Caesarean Section ideally electively for any future deliveries. There is a risk of a new fistula if she tries to deliver without aid.

RESOURCES

Readers who wish to know more should consult the website of the Global Library of Women's Medicine. www.glowm.com. Under the safe motherhood / fistula section (<u>http://www.glowm.com/resource_contents/page/fistula</u>) there are links to two books which can be downloaded for free:

- "An introduction to obstetric fistula surgery" <u>http://www.glowm.com/pdf/Intro to obstetric fistula surgery.pdf</u> which is for beginners and nurses. Hard copies can be purchased from Health Books International.
- "Practical Fistula Surgery". <u>http://www.glowm.</u> <u>com/resources/glowm/pdf/POFS/POFS_full.pdf</u> <u>which is more advanced</u>.

Anyone commencing fistula surgery should know of the publications of Kees Waaldijk. He has the largest personal experience in the world and his publications form the most comprehensive guide to the art and science of fistula surgery. For the beginner he has produced "Obstetric trauma surgery, training manual", obtainable as a pdf file direct from him kees.waaldijk@yahoo.com.

The International Federation of Obstetrics and Gynaecology (FIGO) sponsor training for carefully selected individuals and have some useful information on and fistulae on their website <u>www.figo.org</u>. A series of five **highly recommended** videos on fistula repair by Andrew Browning should be available from FIGO soon.

Note:

If you are a trainee fistula surgeon Brian Hancock is willing to send you a copy of the two books listed above - as long as stocks last. The charity "Uganda childbirth injury fund" can fund the postage. Contact Brian Hancock <u>brian@yealand.demon.co.uk</u> if you are interested.

Ebola Virus Disease: epidemiology, management, prevention and control

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INTRODUCTION

Ebola Virus Disease (EVD) is part of the group of illnesses known as viral haemorrhagic fevers, and was previously known as Ebola haemorrhagic fever. Infection with EVD is acute, severe and often fatal in humans. Five species of the Ebolaviruses have been identified: Zaire, Bundibugyo, Sudan, Reston and Tai Forest^[1]. The Zaire, Bundibugyo and Sudan ebolaviruses were responsible for the largest outbreaks in Africa^[2]. This paper aims to provide an outline of what is known about EVD.

EPIDEMIOLOGY

The EVD occurs in both non-human primates and humans, but the largest outbreak so far was in humans. The first cases of EVD came in 1976 from two simultaneous outbreaks from Zaire (now the Democratic Republic of Congo) and southern Sudan (now South Sudan)^[2]. Both, the Zaire ebolavirus and the Sudan ebolavirus were responsible for these outbreaks, which in Zaire, have caused 280 deaths out of 318 cases (88% case fatality rate)^[3]. Much later, cases were reported from eastern and western African countries^[4]. Between 1976 and 2015 the Ebolavirus has affected over 31,000 and killed

around 13,000 people worldwide ^[2]. The largest outbreak since the discovery of the ebolavirus in 1976 occurred in West Africa between 2014 and 2016 [2]. This outbreak started in Guinea, then spread across land borders to neighboring Sierra Leone and Liberia, and has killed over 11,000 people out of more than 28,000 identified cases ^[5]. During these outbreaks, EVD also affected other countries such as Italy, Mali, Nigeria, Senegal, Spain, the United Kingdom and the United States ^[5]. Failure to contain the outbreak in Guinea due to weak surveillance and poor health infrastructure led to the massive spread of the disease across the different borders. Overcrowding in urban areas, increased movement across the borders and poor personal infection prevention practices worsened the situation. A recent outbreak was announced in the North Kivu and Ituri provinces of the Democratic Republic of Congo in August 2018, killing 92 people as of September 2018 [6].

TRANSMISSION

EVD is zoonotic (i.e. it normally exists in animals but can be transmitted to humans), and fruit bats are considered to be the main reservoir ^[7, 8] - see figure 1. The Ebola virus



Figure 1. The life cycle of ebolavirus (credit: CDC)

enters the human body when breaks in the mucosa or skin come into contact with the blood, secretions, other bodily fluids and organs of infected animals like fruit bats, monkeys, chimpanzees, gorillas, porcupines and forest antelopes. Once in the human body, the virus can be transmitted from one human to another through direct contact with bodily fluids or organs of infected persons, and also with materials and surfaces soiled with these fluids ^[2]. Contaminated materials and surfaces can be anything, such as beddings, clothing, etc. EVD can also be transmitted from human-to-human through sexual intercourse up to 6 months after developing the disease ^[9]. Ebolavirus transmission can also occur during burial ceremonies, when there is direct contact with the dead body of an infected person. Healthcare workers often get infected when treating Ebola infected persons, especially when they do not follow appropriate infection control measures. Ebola infected people continue to infect others as long as they have the virus in their blood.

CLINICAL PRESENTATION

The incubation period is 2-21 days, although in most cases, symptoms occur within two weeks of infection ^[2, 10, 11]. The initial symptoms of EVD include fever, headache, fatigue, muscle/body pain and sore throat ^[2]. This can be followed by epigastric and abdominal pain, nausea, vomiting, diarrhoea, rash, hiccups, chest pain, symptoms of impaired liver and kidney functions, and internal and external bleeding such as gum bleeding, blood in stools and blood in vomitus. ^[2, 12]. Laboratory findings include raised liver enzymes and reduced white blood cells and platelets counts, raised blood urea nitrogen, creatinine and lactate levels, reduced plasma sodium, potassium and calcium levels, and abnormal coagulation profile ^[2, 10].

DIAGNOSIS

It is very difficult to diagnose EVD based on symptoms because in the early stages of the disease it presents like other diseases, such as malaria, typhoid and meningitis. However, during outbreaks, case definition using specific criteria can be used to help in diagnosis (see Table 1). Laboratory methods used to detect infection with the Ebolavirus include:

- 1. serologic tests that detects human antibodies produced against the Ebolavirus,
- 2. antigen tests that detect proteins from the Ebolavirus,
- 3. molecular tests that detect viral nucleic acid (RNA) sequences, and
- 4. the traditional gold standard isolation of the Ebolavirus by cell culture $^{[2, 13]}$.

Table 1: Case definition for Ebola Virus Disease [5]

Persons under investigation (PUI)

PUI is any person with both consistent symptoms or signs and risk factors as follows:

- High body temperature or subjective fever or symptoms including severe headache, fatigue, muscle pain, vomiting, diarrhoea, abdominal pain, or unexplained haemorrhage; AND
- 2. An epidemiological risk factor within the 21 days before the start of symptoms.

Confirmed case

Laboratory-confirmed diagnostic evidence of Ebolavirus infection.

TREATMENT

There is no available specific treatment for the EVD. Current treatment is supportive with oral rehydration and intravenous fluids including blood transfusion, and treatment of specific symptoms. Currently, other potential treatment options including drug and immune therapies, and blood products are being evaluated ^[2].

PREVENTION AND CONTROL

Control of EVD outbreak involve implementation of an intervention package that includes case management, surveillance and contact tracing, laboratory diagnosis, safe burials, social mobilization and community involvement ^[2]. People should be informed of the following ^[2, 14]:

- Prevention of transmission from animal-tohuman: avoiding direct contact with sick animals (fruit bats, monkeys, chimpanzees, etc.) and consumption of their raw meat;
- Prevention of transmission from human-tohuman: avoiding direct/close contact with people having Ebola symptoms. When taking care of the Ebola sick person, gloves and other appropriate personal protective equipment should be worn. Hands should regularly be washed after caring for the Ebola sick patients in hospital or at home;
- **Prevention of sexual transmission:** safe sex and hygiene should be practiced for 12 months from start of Ebola disease symptoms by male survivors of EVD and their sexual partners or using a PCR, testing can be started at 3 months of onset of Ebola symptoms and then monthly until their semen tests negative for the Ebolavirus on 2 separate occasions at least 1 week apart. During this period, healthcare providers should ensure that all EVD survivors and their sexual partners receive counselling on safe sex practices;

• Measures to contain outbreaks: this includes identification of people who have been in contact with an EVD patient and monitoring them for 21 days, practicing safe burial of the dead, separation of healthy individuals from the Ebola patients to prevent transmission, and practicing good hygiene while maintaining clean environment.

Healthcare workers should perform thorough standard precautions and protective measures to prevent contact with infected blood and body fluids and contaminated surfaces or materials. This should include basic hygiene, respiratory hygiene, wearing of personal protective equipment (face shield/mask, goggle, clean non-sterile long-sleeve protective gown, gloves and boots), safe injection practices, safe burial practices, and safe handling of infected samples for laboratory tests from humans or animals^[2].

A vaccine called rVSV-ZEBOV is currently being used in the DRC outbreak, as it is proven to be highly protective against the Ebolavirus ^[15, 16]. WHO recommends that as long as there is no licensed candidate vaccine, the rVSV-ZEBOV vaccine should be used during outbreaks with the Zaire Ebolavirus species, but with informed consent and good clinical practice ^[17].

CONCLUSION

Infection with the Ebolavirus is rare but deadly and has no borders if outbreaks are not contained. However, if appropriate measures are thoroughly and promptly taken, its transmission can be prevented and controlled, especially given the effectiveness of the existing tools, including the new vaccine.

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Ebola on our doorstep: Ebola Virus Disease preparedness in South Sudan

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INTRODUCTION

No disease invokes fear and panic globally like Ebola Virus Disease (previously known as the Ebola Haemorrhagic Fever). Ebola Virus Disease (EVD) is a severe febrile illness which causes death in 25-90% of all the clinically ill, and is caused by the Ebola virus, a member of the Filoviridae family. Five species of Ebola virus (Zaire, Sudan, Bundibugyo, Reston and Taï Forest) constitute the genus Ebola virus. The Bundibugyo, Zaire, and Sudan Ebola virus species cause severe EVD outbreaks in humans. Fruit bats of the Pteropodidae family are considered to be the natural host of the Ebola virus [1]. Epidemics of EVD are thought to begin when an individual becomes infected through contact with the meat or body fluids of an infected animal. Once the patient becomes ill or dies, the virus spreads to others who come into direct contact. Personto-person transmission occurs through direct contact with the blood, body fluids, or skin of patients with EVD, including those who have died. Laboratory diagnosis is essential to confirm EVD cases [2]. Over the last two decades, Ebola virus disease outbreaks have become more frequent^[3]. The unprecedented 2014 outbreak in Guinea, Liberia and Sierra that infected over 28,616 people and killed over 11,000 ^[4] disrupted the entire health systems and almost resulted in a total economic collapse was a stark reminder of the devastation that EVD outbreaks can cause. It also emphasized the need for countries to take proactive preparedness actions whenever there is an outbreak in a neighbouring country.

RISK ASSESSMENT OF EVD SPREAD TO SOUTH SUDAN

The risk assessment of EVD spreading from the epicentre in Ituri province in the Democratic Republic of Congo (DRC) to South Sudan was jointly done by the Ministry of Health (MoH) in DRC with the three levels of the World Health Organization (WHO) and employed the methodology in the WHO guidelines for the risk assessment of acute public health events ^[5]. Based on the initial hazard, context and exposure assessments which considered the porous border of the two countries, the high trade and population movement, the presence of refugees and IDPs along the border areas, the weak and fragile health systems in the region and the similarities in culture, flora and fauna the level of risk was placed at 'high' (similar to that of neighbouring countries like Uganda and Rwanda). On 28th September 2018 the level of risk was raised to 'very high'^[6] as the outbreak in DRC evolved and was compounded by insecurity that saw interruptions in control measures resulting in a number of contacts being missed and new cases being identified that were not known contacts.

South Sudan has previously experienced three EVD outbreaks in 1976^[7], 1979^[8] and 2004^[9] and all these were due to Ebola Sudan species and were not linked to cross-border transmission. Therefore, given the presence of the reservoirs (fruit eating bats) in the greater Equatoria region, it is possible that a sporadic outbreak can happen, and so the country is always at risk.

BASELINE ASSESSMENT USING WHO CONSOLIDATED PREPAREDNESS CHECKLIST

When the EVD outbreak was declared in the DRC, the MoH used the WHO Consolidated EVD Preparedness Checklist^[10] to establish the status of preparedness at the national level as well as to inform the development of a comprehensive contingency plan. The assessment also took into consideration the gaps identified in the Joint External Evaluation (JEE) of the International Health Regulation Core capacities in October 2017^[11]. The assessment revealed serious gaps in Coordination, Risk Communication, Rapid Response teams, Laboratory, Case Management and Infection Prevention and Control, Safe and Dignified Burial and Logistics. Consequently, these thematic areas were earmarked for immediate intervention in order to scale up the capacity to respond given that the DRC outbreak was spreading.

PREPAREDNESS ACTIONS BY THEMATIC AREAS

Leadership and Coordination

The MoH and WHO fast-tracked the operationalization of the first ever Public Health Emergency Operations Centre (PHEOC) to act as the central coordinating body for the EVD preparedness activities. Given the level of



Figure 1: Organogram of the National Task Force (NTF)

risk of EVD spreading to South Sudan from DRC the PHEOC was upgraded from a "Watch Mode" to an "Alert mode", and the National EVD Taskforce (NTF) chaired by an Incident Manager and all key Technical working groups were activated (Figure 1). State level taskforces were activated in the high-risk states of Yei River, Gbudue, Torit, Maridi, Tambura and Jubek. The NTF guided the development of a contingency plan as well as an EVD preparedness operational plan and the updating of all the standard operation procedures (SOPs) for all the Technical areas of an EVD response. Over 20 Meetings of the NTF have so far been conducted, some of which have been chaired by the Honourable Minister of Health, Dr Riak Gai Gok. Six strategic areas of preparedness were identified as shown in Figure 1: The NTF has also mobilized donors to pledge towards the USD 11 million EVD preparedness operational Plan. These funds will be channelled to the different UN agencies and partners supporting different technical areas of the preparedness. So far over USD 2 million have been received by different partners to support the preparedness efforts.

Access, Security and Safety

The fact that the second wave of EVD cases in Beni, DRC has been driven by insecurity and access impediment prompted the NTF to focus on access, safety and security. High-level engagement in conflict-affected areas with armed groups enabled the establishment of screening points in parts of Yei River State such as Kaya and Okaba.

Risk Communication and Social Mobilization

Communities' perception of the risk of EVD as well as their acceptance of prevention and control measures is vital for any preparedness and control efforts. The MoH with support from UNICEF, WHO and other partners has rolled out different risk communication and community engagement strategies. High-level advocacy visits led by the National Minister of Health was made to all the priority states; mass media messaging, community meetings and Information, Education and Communication (IEC) materials have been updated and disseminated. The community has been supportive and has been calling the hotline to seek for more information or to report suspected cases or deaths. This needs to be sustained through continuous engagement and regular, accurate communication.

Epidemiology, Surveillance and Laboratory

• An Alert desk was created at the National Public Health Emergency Operations Centre with a toll-free hotline; this has received over 1200 calls of which three have been suspected Ebola cases - that were investigated and tested negative.

• To improve case detection and investigations, standard case definitions have been distributed across the country and Rapid Response teams are undergoing training and receiving mentorship from experts (WHO, Centers for Disease Control and other partners) on case investigation and contact tracing.

• At the National Public Health Laboratory over 20 laboratory personnel were trained on Biosafety and Biosecurity for management of infectious samples as well as EVD molecular testing using Genxpert Technology. This enabled the country to conduct its first in-country EVD Diagnostic test in October ^[12].

Points of Entry

• Over 39 Points of Entry have been mapped for establishing screening points, of which 14 have been prioritized in the high-risk states of Yei River, Gbudue, Tambura, and Torit - all these are currently operational. The Juba International Airport screening point has been upgraded to meet the requirements under the International Health Regulations 2005; Nimule ground crossing screening, which is the busiest in the country with over 4,000 travellers per day, is also being upgraded. Over 300,000 travellers have been screened in all 14 sites with 13 alert cases picked but none met suspected case definitions.

CASE MANAGEMENT AND INFECTION PREVENTION AND CONTROL

• Prompt isolation of suspected Ebola cases and the early

initiation of support treatment is a Key Pillar of Ebola response that reduces EVD transmission and increases the chances of survival for those infected. Using the WHO Consolidated EVD preparedness checklists, the MoH noted that there were no isolation facilities in the country and the level of infection prevention and control in most health facilities was sub-optimal. The amount of information given to health care workers increases their understanding of EVD and their engagement in training ^[13]. Therefore the MoH conducted orientation sessions to frontline healthcare workers in the early phases of the DRC outbreak, and training in 10 priority sites on comprehensive case management and infection prevention between October and November 2017.

• Construction of 10 isolation sites in Jubek, Yei River, Gbudue, Torit and Tambura states has been prioritized by the National taskforce with support from the donors.

• Safe and dignified burial teams were identified in Juba, Yei and Yambio and are undergoing training.

Vaccines and Therapeutics

The latest tool for the control of an EVD outbreak is the recombinant vascular stomatitis virus (rVSV) vaccine against Ebola Zaire (ZEBOV). This vaccine, although not yet licensed, has been reported to be safe with high efficacy ^[14]. It is being used in DRC for the response, and in Uganda among the frontline health workers as a risk mitigation. The Vaccine and Therapeutics working group has initiated the process of obtaining ethical clearance for the compassionate use of the vaccine among frontline health workers. Once this is obtained, WHO and other partners will support the vaccination of health workers as per the approved protocol.

CONCLUSION

South Sudan will remain at risk of EVD outbreaks for the foreseeable future. Therefore, it is important that relevant capacity to detect, investigate, respond and contain any outbreak at source is developed as required under International Health Regulations (2005). The country has not yet attained operational readiness, however significant progress has been made by the MoH and partners. Given the history and context of the Health System in South Sudan there is a need for more support to ensure that the required level of readiness for any EVD outbreak is attained.

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Internship training in South Sudan: the challenges and way forward

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Entry to medical school is always competitive and brings challenges for the student. However medical students do not have a direct responsibility for the care of patients. This all changes from the moment of passing the final qualifying examinations. The prospect of a new career is often daunting and this increases as one advances towards more senior positions within the medical profession. Medical mistakes must be minimized and there is no place for negligence. To achieve this a period of supervised training known as 'internship' or 'housemanship' is undertaken once the student has qualified as a doctor. This training is designed to enable him / her to consolidate clinical knowledge, extend technical skills and develop personal attitudes to fit him/her for a life within the profession.

The Intern may be referred to as a House Officer or Houseman/Housewoman. In the UK, for example, they are known as Foundation Doctors. These are graduates of a college of medicine, holders of MB, BS (Bachelor Medicine and Bachelor of

Surgery), they still lack adequate clinical experience and are not fully licensed by the medical councils of their countries.

The House Officer is the professional whom the patient meets most often when entering hospital and will remember for a long time. He/she is the face of the hospital, the source of joy and sometimes sorrow among patients and their families. The House Officer is the doctor who attends initially to all emergencies in the hospital outpatient department as well as following patients admitted to the wards. He/she makes the necessary calls to senior staff for advice about management.

This extraordinary commitment and work load of the House Officers at Juba Teaching Hospital has received little recognition by the authorities. The challenges are rarely covered by the media. Several appeals have been made to the Ministry of Health by the junior doctors with little and inadequate response. In April 2016 this situation resulted in a strike. Through the President's intervention these doctors were paid for ten months at once and resumed their duties. This was the last payment received by House Officers until the time of writing. The reputation of the Ministry of Health and the service it oversees is the consequence of hardworking countrymen

Stress is a serious matter as it affects clinical performance and decision making

who toil without pay.

The challenges that appear when passing from the status of a student to the role of a newly qualified doctor bring the potential for stress. For some this can be frightening. The causes of stress are multifactorial and include a heavy work load and a poor work-life balance, inadequate clinical supervision, some aggressive and demanding patients and families with unreasonable expectations, a lack of sympathetic understanding by senior colleagues and management, threats of medical-legal action and financial concerns because of small, if any, salaries. These doctors have personal expense commitments as well as responsibilities to their families. This stress is a serious

matter as it affects clinical performance and decision making and hence the health outcomes for the patients.

In the last three years the Ministry of Health and Juba Teaching Hospital have adopted a system of not paying the junior doctors salaries and not recognizing their legal rights as employees. They are Interns

in name only. This unfair decision has turned the House Officers into free workers.

Additionally the young doctors often work in poor and unhygienic environments. Their safety is neglected. They are denied vaccination against some of the deadliest infections e.g. hepatitis B virus which can be contracted easily during clinical practice. Laboratory coats are not provided.

Most House Officers cope well with these challenges and exit the intern year well prepared for the next stage in professional development. However, some challenges require study and need urgent intervention from the authorities. This is justified on humanitarian grounds alone. However, there is also a national economic dimension. It is expensive to train a doctor and it is in the best interests of everyone in our country to have a content and efficiently performing medical doctor workforce.

I therefore appeal to all authorities (the Ministry of Health, the South Sudan Medical Council, Juba Teaching Hospital and the Postgraduate Centre) to face up to and urgently address the matters outlined in this paper.

We are a proud nation and collectively want the best for our citizens.

The current crisis of human resource for health in Africa

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In his speech at an All Africa Conference Program, Patrick Lumumba said, "This trend that continued in postcolonial Africa has generated young men and women, whose greatest desire is to flee Africa to Europe and America"^[1]. Brain drain has been a source of despair for developing countries, especially in the African continent. It exemplifies a symptom of a more complex syndrome inflicting politically and economically unstable countries. Africa happens to be home to a majority of politically and economically volatile governments compared to other continents. The healthcare sector arguably bears the hugest brunt imposed by this growing problem of

brain drain. This is partly due to the fact that healthcare human resources are already meagre in Africa; and unfortunately, these already scanty human resources are fleeing Africa seeking greener pastures.

According to the World Health Organization, 37 out of the 57 countries with human resources for health (HRH) crisis are in the Sub-Saharan Africa. Frustratingly, little

progress has been made since the problem was officially identified in the Alma Ata declaration in 1978. Thirty three years later in 2011, 33 out of 44 countries included in a survey are still classified to be suffering a human resources for health crisis ^[2]. Fieno et al identified some political and economic hurdles that stand against the improvement of the healthcare human resources crisis. They cited lack of political and institutional incentives, bureaucratic hurdles, confusion due to involvement of multiple stakeholders, limited resources, and weak civil society pressure ^[2]. Sparse financial resources allocated by governments for healthcare unquestionably play a central role in this crisis. Only a handful of African countries were able to adhere to the Abuja declaration in 2001 that recommends governments to dedicate 15% of their annual budgets for healthcare.

The financial incentives and the charm of practicing medicine in urban centres in most African countries is further worsening the healthcare human resources crisis. Government healthcare facilities within urban centres are usually better equipped relative to their counterparts in rural

Only a handful of African countries were able to adhere to the Abuja declaration in 2001 that recommends governments to dedicate 15% of their annual budgets for healthcare.

areas. They provide a better and more appealing working environment for healthcare providers. Furthermore, it is more convenient for physicians to establish their private practices in these areas, which are more vibrant economically. This has left the poor rural population who are perhaps at the direst need for healthcare to suffer the most from this crisis. In other words, within an already human resources compromised healthcare setting, there is a brain drain from rural to urban centres.

If Africa is to counter the healthcare human resources crisis, member states may need to adopt radical reforms

in the healthcare sector. Many reports and papers examined this problem and came up with recommendations to tackle it. The United States Agency for International Development (USAID) Office of Sustainable Development in February 2003 suggested the adoption of a strategic approach that involves a better informed human resource, targeted training that suits specific country needs, and more flexible professional and labour standards ^[3].

It is also obvious that lucrative financial remunerations could play a central role in that battle to keep the brightest brains in African from wandering off in search of pastures green. Perhaps, one day, this may actually reverse the equation and make Africa attractive to skilled labourers from all over the world, a brain gain.

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Call for Submissions

South Sudan Medical Journal Special Issue on Primary Health Care, May 2019







The Alma-Ata Declaration of 1978 adopted the primary health care (PHC) approach as the basis for achieving the goal of "Health For All". Sudan was among the first countries to adopt and implement the PHC model. The world met again, after 40 years, on 25 – 26 October 2018 in Astana, Kazakhstan, "to renew a commitment to primary health care to achieve universal health coverage and the Sustainable Development Goals".

According to WHO, at its heart, "primary health care is about caring for people, rather than simply treating specific diseases or conditions. PHC is usually the first point of contact people have with the health care system. It provides comprehensive, accessible, community-based care that meets the health needs of individuals throughout their life".

SSMJ is making a call for submissions for a jumbo special issue of the journal dedicated to discussing all aspects of PHC.

SSMJ welcomes original researches, reviews, summaries and letters to the editor related to the PHC experience past and present, dealing with, but not limited to the following areas:

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SSMJ is also seeking sponsors, who will be featured in the journal, to support the printing and distribution of this special issue of the journal in South Sudan.

For more information, contact the Editor-in-Chief at: <u>admin@southernsudanmedicaljournal.com</u>

The medical fraternity in South Sudan was hit very hard in August and October 2018 with the loss of four of its prominent members. These colleagues served the people and the country diligently. From a doctor who was a fearless advocate for peace and women issues to a pharmacist loved by all, to the doctor who walked the jungles of South Sudan fighting sleeping sickness, and a tireless physician who worked in many parts of the Sudan, the SSMJ honours their legacy in this issue; we remember their contribution in building a strong health service delivery system in South Sudan that meets the expectations of the community they served.

Editor-in-Chief

Dr Priscilla Nyanyang Kuch

Dr Priscilla Joseph Kuch, born in 1964, was a South Sudanese politician, peace activist and Associate professor of community medicine at the University of Juba's College of Medicine.

Dr Priscilla earned her Bachelor of Medicine and Surgery (MBBS) in 1978 from the University of Khartoum. She received her Master of Community Medicine in 1987 also from the University of Khartoum.

During her life, Dr Priscilla served in many positions of influence in the society and government. Between 2005 and 2010 she served as a Sudan People's Liberation Movement (SPLM) member of National Assembly and Chairperson of the Human Rights Committee in the National Parliament. She was appointed Minister Without Portfolio in the Cabinet of South Sudan on 10 July 2011. She was also the former deputy minister for gender, child and social welfare (2011-2013). As deputy minister, she traveled to New York City in



2013 for the 57th Session of the Commission on the Status of Women and while in New York met with the Program on Peace-building and Rights at Columbia University's Institute for the Study of Human Rights.

Dr Priscilla was one of the founding members of the South Sudan Doctors' Association (SOSDA) in 2005 and played a crucial role in its development. She will be remembered as a tireless advocate for women rights in South Sudan.

She died on 8 October, 2018 in the Sudanese capital Khartoum while undergoing treatment

Dr James Ukello Morgan



Dr James Morgan was a physician working in Wau, Western Bahr el Ghazal State. Following his graduation from the University of Khartoum in 1983, Dr James worked in several hospitals in Sudan: Sennar, Duem, Kawa, Um Jar, Kosti, Managil and Medani.

In 1987, Dr James joined the Health Ttraining Institute for Medical Assistants as its academic Director in Wau, South Sudan, then moved to Medani due to the conflict in 1988. He served in this position until its closure in 1998. Dr James continue to work at Medani hospital and joined the University of Gezira to pursue his graduate studies in Internal Medicine, which he finished in 2001.

Dr James served in several prominent positions in his life. He was Minister of Health for five years from 2001-2005 in Western Bahr el Ghazal State until the dissolution of government following the peace agreement. He worked as Director General of Wau Hospital, Director General of the Ministry of Health in Wau, as well as with the United Nations in Wau. He was also teaching at the University of Bahr el Ghazal. Dr James was loved by his community, in which he was an active member in many ways, being especially supportive of traditional dance groups in his community.

Dr James died on 31 August, 2018 in Wau. He is survived by his wife and six children.

Dr Jacob Lazarous Daro Lopidia

Born in Juba on 18 August 1953, Dr Jacob Lazarous obtained his bachelor's degree in pharmaceutical sciences from the University of Zagazig in Egypt in 1982.

Following his return, Jacob joined the Regional Government and worked in Juba as a pharmacists at Juba teaching Hospital. In 1991, Jacob joint the Equatoria Coordination office in Khartoum as its health Coordinator until 1994.

Dr Jacob has worked in several positions since then. He joined tayfour Pharmacy and worked with them in Gaderif; worked with the General Medical Stores of the national Ministry of Health in Khartoum Sudan and as Regional Pharmacy Supervisor based in Malakal, South Sudan.

Since 2012, Dr Jacob served as the Director for Pharmaceutical Services of the Central Equatoria State (Jubek State).

Dr Jacob suffered a heart attack and died on 29 August 2018 at his house in Juba. He is survived by two wives and eight children.



Dr Apollo Oliver Duku



Dr Apollo was born on 29 August 1969 in Turbigen, Germany, to father Dr Oliver Duku and mother Tabitha.

Dr Apollo received his Bachelor of Medicine and Surgery (MBBS) from the University of Juba. He worked in Gaderif Civil Hospital as well as Bentiu with Unicef in 2000 – 2002, as County Medical Officer in Kajo Keji (2002 – 2005) and as medical officer at Juba Teaching Hospital from 2005 – 2006.

From 2006, Dr Apollo worked as Deputy Director for the sleeping sickness programme of the South Sudan Ministry of Health until his demise in Juba on 7 August, 2018.

Neonatal resuscitation chart – see page 108

Prepared by Dr Frankie Dormon and Dr Kirsty Wright in partnership with Mercy ships

Correspondence: Frankie Dormon frankie@pride.me.uk

This chart is designed with the '<u>Helping Babies Breath</u>' training in mind. However, it incorporates external cardiac massage, which can be effective in some cases. We have used the same colour coding: **GREEN** for 'Good', **ORANGE** for 'Be prepared and ready to act', and **RED** for 'Danger, call for help'.

To effectively resuscitate a newborn, there must be a warm dry cloth to dry and stimulate the baby first, and a suitable baby mask and ventilation bag. Suction is rarely required and oxygen very rarely needed. Time is most important. If a newborn is not gasping after 10 minutes, the chances of a good outcome without a neonatal intensive care unit are very small.

This chart has been used very successfully in training over 120 midwives in Cameroon and Benin. I am very grateful to the staff of Mercy Ships who have helped in its development.

See also the film on neonatal resuscitation made by <u>Medical Aid Films</u>, which is a useful adjunct to this chart.



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.