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Floods, Conflicts, Diseases: South Sudan's Triple Tragedy

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- Contraception methods and abortion
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A flooded village along the Sobat river, Credit Nicola Flamigni, MSF

Floods, conflicts and diseases: the triple tragedy

Dr. Edward Eremugo Kenyi

Editor-in-Chief

South Sudan Medical Journal

Since July 2019 many parts of South Sudan has experienced heavy downpours that has led to flooding and displacement. Although floods do occur in these areas occasionally, the level it reached this time had never been seen before. The U.N. Office for the Coordination of Humanitarian Affairs (OCHA) said that since July almost a million people have been affected by the abnormally heavy seasonal floods across the country.

An aerial assessment from Gumuruk to Lekongole, shows people in canoes and their completely submerged tukuls (Credit MSF)

President Kiir declared a state of emergency in the affected areas of Greater Bahr el Ghazal, Upper Nile, and Equatoria States "to enable the government and other institutions, and other governments of goodwill, to render services." [1]

The International Organization for Migration (IOM) and partners are ramping up their humanitarian response to affected communities. According to IOM South Sudan Chief of Mission, Jean-Philippe Chauzy, "the level of destruction caused by the floods is unfathomable. People have nowhere to sleep, children are sick, there is no food to eat." [2]

The affected communities were already devastated by the conflicts in their regions and were facing hunger, with children already showing signs of extreme malnutrition. In addition to blocking access to health facilities and drugs, the floods come with the fear of communicable diseases.

The World Health Organization (WHO) asserts that floods can potentially increase the transmission of the following communicable diseases: water-borne diseases, such as typhoid fever, cholera, leptospirosis and hepatitis A, and vector-borne diseases, such as malaria, dengue and dengue haemorrhagic fever.[3] Other health risks posed by flooding include drowning, injuries and trauma.

The needs of the affected communities are huge. In addition to the medical supplies and clean drinking water needed to curb disease outbreaks, these communities, already under severe risk of famine, will need food aid for a long time, as their farms and livelihoods are destroyed by the floods.

The floods have affected not only South Sudan, but other parts of the East and Southern African countries as well. The unprecedented rains can be linked to the effects of climate change, which affects weather patterns across the globe. Some parts of Africa are facing drought. South Sudan may be seeing the first effects of the climate crisis.

Although the floods cannot be prevented, we call on the government to mitigate the risks to communities by establishing an Emergency Response Unit to deal with the effects of floods and to pre-position drugs and supplies for quick delivery to those affected.

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Underreporting of Hepatitis E virus infection in Tanzania: a systematic review

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Introduction: Hepatitis E virus (HEV) frequently causes acute hepatitis with water-borne outbreaks in endemic areas. Updated evidence is required in Tanzania to inform the policymakers and identify research gaps.

Objective: The aim of this study was to analyse publications on the epidemiology of HEV in Tanzania.

Methods: We systematically searched all available publications from the major research databases, and selected websites for unindexed studies, policies, and reports for data reporting on the epidemiology of HEV in Tanzania from inception to date.

Results: Five articles were found. There was only one study, performed in 1998, that reported the prevalence of HEV infection in the general Tanzanian population (0.2%). Three other studies reported prevalence's of 8%, 6.6% and 0% among HIV-infected pregnant women, reproductive-aged women (15-45 years), and HIV uninfected pregnant women respectively, with no identified associated factors for HEV infection. One last article described an outbreak that affected 690 people with children's predominance, only 49 samples were tested for HEV and 14 confirmed positive.

Conclusions: Our study showed that HEV infection appears to be markedly underreported in Tanzania as evidenced by a significantly lower reported prevalence compared to neighbouring countries with similar demographics. Increased awareness of this disease by health care professionals and further epidemiological studies to establish the baseline data of the disease are needed urgently.

Keywords: Hepatitis E, prevalence, epidemiology, review, Tanzania

INTRODUCTION

Hepatitis E virus (HEV) infection is one of the commonest emerging diseases. It has affected 20 million people with 3.4 million symptomatic cases worldwide. Approximately 56,600 people have died and 3,000 stillbirths have occurred worldwide in 2005 due to HEV-related conditions.[1] HEV genotypes 1 and 2 are endemic in developing countries, and the major route of transmission is faecal-oral usually through contaminated water. HEV-1 and HEV-2 usually cause epidemic hepatitis that occurs sporadically throughout the year. Clinical presentation varies widely from asymptomatic or non-specific symptoms through severe life-threatening fulminant hepatitis and acute liver failure. Pregnant women especially during the third trimester have increased risk with subsequent development of adverse foeto-maternal outcomes (fulminant hepatic failure, preterm delivery, low birth weight and foetal mortality.[2] Also, other co-infections such as Human Immunodeficiency Virus (HIV) and Hepatitis B virus (HBV) have been correlated with increased frequency and exacerbated effects of HEV infection.[3]

In Africa HEV seroprevalence varies greatly from 0%-94% in the general population and outbreaks, with the case fatality rates of 17.8% and 42.1% in the general

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population and pregnant women respectively. The largest outbreak in Africa was reported in Uganda in 2007, which led to an attack rate of 25% of the population.[4]

Tanzania, one of the most resource-constrained countries in Africa, has poor foeto-maternal outcomes and a high burden of HIV and HBV infections. Clear information on the actual extent of HEV infection is needed. In this study we reviewed the available literature on HEV infection to determine the current situation, and to identify future areas of study.

METHOD

All English full articles or abstracts that reported on HEV in Tanzania were reviewed. We searched PubMed, Web of Science and Scopus databases for the article titles and/or abstracts published from inception to 30 September 2019. There were no initial exclusion criteria, as we aimed to review all available articles related to HEV. However certain publications were excluded later as indicated in Figure 1. The following search term combinations were used: ("hepatitis E" or "HEV" or "non-a" or "non-b" or "viral hepatitis" or "enteric hepatitis") AND ("Tanzania" or "Zanzibar" or "Arusha" or "Dar es Salaam" or "Dodoma" or "Geita" or "Iringa" or "Kagera" or "Katavi" or "Kigoma" or Kilimanjaro" or "Lindi" or "Manyara" or "Mara" or "Mbeya" or "Morogoro" or "Mtwara" or "Mwanza" or "Njombe' or "Pemba" or "Pwani" or "Rukwa" or "Ruvuma" or "Shinyanga" or "Simiyu" or "Singida" or "Tabora" or Tanga" or "Unguja"). The latter is a list of all administrative regions in Tanzania. The relevant references from obtained articles were also reviewed. Gray literatures were also searched in the websites of Tanzania Ministry of Health, Community Development, Gender, Elderly and Children[5], Tanzania National Bureau of Statistics [6], World Health Organization's country office [7] and Google search engine.

A total of 127 studies were identified after removing the duplicates; 64 from PubMed, 49 from Web of Science, and 13 from Scopus and one webpage. Out of these, we excluded 121 articles mainly because they did not contain data on HEV; and so, four studies and one webpage report remained for qualitative synthesis (Figure 1).

RESULTS

Epidemiology of HEV

There was only one study assessing HEV prevalence in the general population of Dar es Salaam in 1998. In this study one 26-year old woman out of 403 healthy volunteers (0.2%) was found to be seropositive for HEV. [8] Another study, in women of childbearing age (15-45 years) in a rural population of Moshi, in the northern part of the country, reported the HEV seroprevalence of 6.6%. In this study there was a trend, albeit not statistically significant, of increasing rates of HEV positivity in women aged 35 years and older compared with the younger group (9% vs. 5%). Other socio-demographic factors including residence and number of children were not associated with HEV infection. [9] Menendez et al [10] reported that no evidence of HEV infection in 180 pregnant women tested during the third-trimester of pregnancy in Ifakara, in southern Tanzania. A more recent study in 2018 has shown a higher HEV seroprevalence of 8% among HIV-infected pregnant women in the third trimester and at 9-months post-partum in the urban population of Tanga City. In this follow-up study, the annual HEV incidence rate was 1% (confidence interval 0.2%-3.4%). The median ages of HEV infected and uninfected groups were 28.0 (IQR 24-31) years and 28.5 (IQR 24-30) years respectively (p>0.05). The gestation age and CD4 counts were comparable between the two groups.[11] More details of these studies are in Table 1.

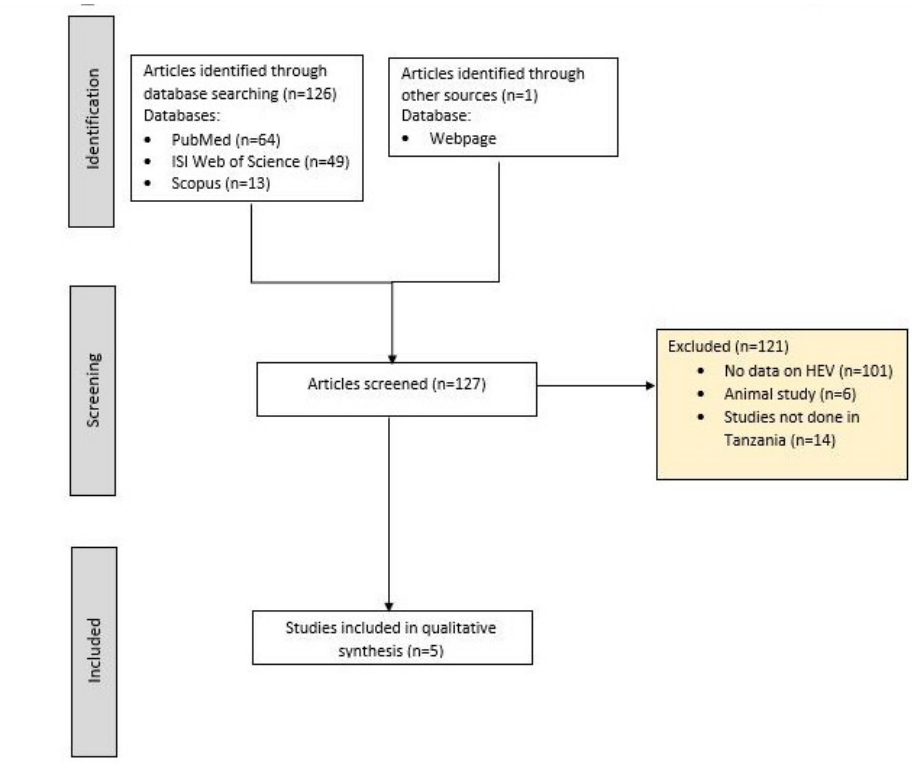

Figure 1. Flow diagram of the literature search and selection process.

Table 1. Characteristics of the studies selected for review

Author	Year of sampling/ publication	Region	Cohort	Sample size	HEV diagnostic method	Prevalence
Harritshoj, et al [11]	2006-2011/2018	Tanga	HIV-infected pregnant women	200	IgG$^{\alpha}$	8%
Stark, et al [9]	1996/2000	Kilimanjaro	Reproductive aged women	212	NS$^{\beta}$	6.6%
Menendez, et al [10]	1995/1999	Morogoro	Pregnant women	180	NS	0%
Miller, et al [8]	1992/1994	Dar es Salaam	Health volunteers	408	NS	0.2%

α IgG: Immunoglobin G βNS: Not stated

HEV outbreaks

One HEV outbreak was reported in 2013 in Buhingwe Kigoma, the western region of Tanzania. Six hundred and ninety patients were affected, most (61%) were children aged less than 15 years,; 54% were females. Most of the patients presented with general features: headache, fever, abdominal pain, general malaise, loss of appetite and vomiting. Jaundice and diarrhoea were rarely reported. The pregnancy state was not reported and there were no recorded deaths. In this outbreak, only 49 samples were actually tested, of which 14 were confirmed positive.[12]

DISCUSSION

High rates of HEV seroprevalence in the general population have been reported in neighbouring countries: Uganda (47.7%)[13], Zambia (42%)[14] and Kenya (18%).[4] We have identified one study[8], which reported only one case of HEV infection in the general Tanzanian population and a few other studies exclusively from female subjects. [9, 10, 11] These provide insufficient data to accurately represent the situation in Tanzania. This knowledge gap might arise from a low rate of routine HEV testing because of poor clinical awareness, unavailability of the resources and the tendency of diagnosing and treating for clinical malaria the patients that present with non-specific symptoms.[15] It is likely that significant HEV infection rates do occur in Tanzania given the recorded higher rates in neighbouring countries. The maternal complications associated with HEV infection cannot be neglected. Hence there is a need for updated information on the status and clinical presentations of the disease particularly in high-risk populations such as pregnant women. Also, adequate access and testing of these subjects should be advocated.

It is not uncommon for HEV outbreaks to occur in displaced communities and refugee camps due to poor hygienic conditions. Uganda and Kenya, on the northern border of Tanzania, have had major HEV outbreaks affecting about 14,000 people with fatality rates of 6.6% in the general population and 77.7% in pregnant women. [4] In both of these outbreaks, water contamination and person-to-person contact were the major sources of infection. Even though the Tanzanian experience in 2013 [13] was less devastating, vulnerability to more critical incidents should not be underrated. Therefore comprehensive health education on the improvement of general hygienic measures for patients presenting with general symptoms, and high- risk groups would be beneficial to reduce transmission. Also, an improved case detection in this population will lead to a better and timely supportive care.

CONCLUSION

Despite the indicators for its endemicity, our study suggests that the reported rates of HEV in Tanzania are considerably lower than neighbouring countries. This is probably due to poor clinical awareness in the presence of non-specific symptoms. The risk of misdiagnosis is increased with consequent inappropriate management. Thus, more studies in different population groups are required to provide the baseline status of the disease and to hasten the establishment and implementation of evidence-based control policies, which are currently not available.

Conflict of interest: None

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Contraception method following spontaneous abortion in N'djamena Mother and Child Hospital

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Introduction: Contraception is the prevention of pregnancy. It can be offered immediately after a spontaneous abortion.

Objective: The aim of this study was to show the characteristics of patients accepting contraception after a spontaneous abortion and the main contraception methods chosen.

Method: This was a 5-month prospective survey conducted from July to December 2017at N'djamena Mother and Child Hospital in Chad.

Results: Of the135 patients recruited 81 (60%) agreed to use a contraceptive method; 33.3% of these 81 women were aged 20-24 years, and 67.9% chose the injection method of contraception.

Conclusion: Contraception methods are often used following a spontaneous abortion by patients at N'djamena Mother and Child Hospital in Chad. Injection was the preferred contraception method.

Keywords: contraception, spontaneous abortion, Chad

INTRODUCTION

Contraception is the prevention of pregnancy and different methods are available. The best choice of contraception is the one that most closely meets the needs and circumstances of an individual.[1] According to the African Society of Gynaecology and Obstetrics, abortion is the end of a pregnancy at less than 28 weeks.[2] Spontaneous abortion is one of the circumstances that necessitate the need for contraception. Some forms of contraception can be done immediately after clinicians are confident there has been expulsion of products of conception which ensures that the uterus is empty, but conditions, such as infection, contraindicate the use of an intra-uterine device.

In Chad, the prevalence of women using contraceptive methods is 6% which correlates with a high fertility rate of 6.4%. [3] There is a high maternal mortality rate of 860 /100,000 live births.[2] One way to help curb maternal mortality is by increasing contraceptive use and closing the gap on unmet needs for contraception among women of child bearing age.

Contraception is estimated to reduce 44% of maternal deaths, and result in a 'maternal death averted ratio' (MDAR) of 27 per 100,000 women using contraceptive methods per year.[3] A proposed mechanism for this effect is that contraception use reduces the number of high risk and high parity births.[4] Increased availability of contraception also helps to prevent unwanted pregnancies which can result in unsafe abortions, a leading cause of maternal death globally. [5] Based on this understanding, one way to help curb maternal mortality is to increase the use and the availability of contraception methods.

Citation:
Madoué et al. Contraception method following spontaneous abortion in N'djamena Mother and Child Hospital. South Sudan Medical Journal 2020; 13(1):9-11

The proactive management of contraception following abortion is rare in Chad. This study aimed to describe the characteristics of patients accepting contraception and the main methods of contraception used after a spontaneous abortion.

METHOD

This was a 5-month prospective survey (from 17 July to 29 December 2017) of contraception methods following spontaneous abortion at N'djamena Mother and Child Hospital.

One hundred and thirty-five patients admitted for the management of spontaneous abortion were included in the study. Informed consent was obtained from all. Patients who refused to give consent and those with other diagnoses were excluded. Contraception was provided after ensuring the emptiness of the uterus (complete or incomplete abortion). Study variables were demographic and clinical characteristics. Data were collected and analysed using EPI INFO 3.5.1 software.

RESULTS

All patients admitted for spontaneous abortion received information about contraceptive methods before discharge. Only 81 patients (60%) of the 135 patients included in the study agreed to use a contraceptive method.

Table 1 shows that 33.3% of these 81 patients were aged between 20-24 years and 29.6% were aged 25-29 years; the mean age was 24.7 ± 2.34 years; 60.5% had secondary level education.

Of the 81 patients agreeing to use contraception, 75.4% had abortions occurring in the first trimester of pregnancy; 67.9% had incomplete abortions and 32.1% had complete abortions (Table 2). Those with incomplete abortion were treated by intra-uterine aspiration or misoprostol (depending of the diameter of the remaining tissues in the uterus and the quantity of blood loss).

The majority (67.9%) of these 81 women chose the injection method of contraception, 18.5% chose the implant and 13.6 chose the pills.

Table 1. Socio-demographic characteristics

Socio-demographic characteristics	n (%)
Age (years)	
15 – 19	6 (7.4)
20 – 24	27 (33.3)
25 –29	24 (29.6)
30 – 34	8 (9.9)
35 –39	11 (13.6)
40 – 44	5 (6.2)
Level of education	
Primary	10 (12.3)
Secondary	49 (60.5)
University	4 (4.9)
No education	18 (22.2)

Table 2. Timing and type of abortion

Clinical characteristics	n (%)
Timing of Pregnancy	
First trimester	61 (75.4)
Second trimester	20 (24.6)
Type of abortion	
Incomplete	55 (67.9)
Complete	26 (32.1)

DISCUSSION

Only 81 (60%) of the 135 patients chose to use a contraceptive. This frequency of contraceptive use acceptance is lower than that reported by Benson in Peru in 2001[4] where 80% of patients accepted to use contraception after abortion. This is higher than the national prevalence of contraception use in Chad which is estimated at 6%.[2]

The low acceptance rates for contraception in this study could be explained by the fact that more than half (62.9%) of the participants in this study were women aged less than thirty years which is a prime period for fertility. The majority (60.5%) of those accepting a contraceptive method had a secondary level of education and perhaps were more informed or aware of it.

Contraception has been shown to prevent pregnancy after an abortion. Ovulation can occur in the 2nd to the 4th week following abortion and 75% of patients will have ovulation in the next six weeks.[6] Despite the trimester of pregnancy and the type of abortion (complete or not), contraception is necessary.[1] In this study the majority of the patients were in the first trimester (75.4%) and the abortion was incomplete in 76.9%.

After an abortion, the current advice is that women should wait for at least six months before becoming pregnant again; this reduces the risk of maternal anaemia, foetal growth restriction, miscarriage and premature rupture of the membranes.[1,7] Contraception is a way to space births and is beneficial for both mother and unborn child.

There are many contraceptive methods nowadays and each has its indications, contraindications and side effects. No method is 100% effective.[8]

In Chad contraception methods are controlled by the government and all are freely available at government health facilities. The main contraceptive methods available are: injection, pills, implant, condoms and intra-uterine devices.

In this study, 67.9% of patients who opted for contraception chose the injection method. This was higher than that reported by Foumsou[9] who found the use of contraception in N'Djamena was 58.6%. The higher acceptance rate in this study can be explained by the fact that, unlike in Foumsou's study, it was carried out immediately after abortion when the need for contraception is high.

CONCLUSION

The frequency of contraception use after spontaneous abortion in this study is higher than the national rate of contraceptive use showing it is a good opportunity to offer advice to women. The injection method was the most commonly used.

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The burden of hypertension and its associated factors among adults in Ruvuma, Southern Tanzania

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Mwita et al, The burden of hypertension and its associated factors among adults in Ruvuma, Southern Tanzania. South Sudan Medical Journal 2020; 13(1):12-18

Introduction: The prevalence of non-communicable diseases, and hypertension in particular, has been increasing.

Objective: To determine the prevalence and associated factors for hypertension among adults in Ruvuma, Southern Tanzania.

Methods: A cross-sectional study was conducted from September to October 2017; 802 patients were recruited, and data were collected on demographic, behavioural and clinical characteristics, and blood pressure, which were analysed using SPSS version 24.0. Associations and statistical significance were calculated using Odds ratio at 95% CI, and p-values of <0.05 were considered statistically significant.

Results: Overall, prevalence of hypertension (systolic blood pressure ≥140 and/or diastolic blood pressure ≥90 mm Hg, or known hypertensive patient on treatment) was 20.4% (21.4% and 19.5% in women and men, respectively) and that of pre-hypertension was 35.9%. Hypertension was associated with increasing age (p=0.01), excessive salt consumption (p<0.0001), and history of hypercholesterolemia (p<0.0001).

Conclusions: The prevalence of hypertension and pre-hypertension are relatively high. Intervention measures to prevent and control the disease are mandatory to prevent its progression and reduce morbidity and mortality.

Keywords: Hypertension; pre-hypertension; associated factors; prevalence

INTRODUCTION

The burden of non-communicable diseases is increasing in developing countries. [1,2] The World Health Organization estimates that by 2030, non-communicable diseases may cause up to46 % of deaths in sub-Saharan Africa.[2] Hypertension is a major modifiable risk factor for cardiovascular disease (CVD) and premature mortality.[3] Sub-Saharan Africa has more than 75 million hypertensive individuals and by 2025 it is estimated that about 125.5 million people will be affected.[4] The prevalence of hypertension varies between and within countries [5], in Tanzania, it varies from 16.4% in the west [6] to 28.0% in the north.[7]

The lifestyles of populations have changed with greater urbanization and economic growth. Many people exercise[7] less than previously while diets are often lower in fibre, but higher in salt, fat and calories. [8,9]

Little is known about the magnitude and determinants of hypertension in Southern Tanzania.

Objective

The objective of this study was to determine the burden of hypertension and assess associated factors among adults visiting the outpatient unit of a tertiary level health facility in Ruvuma, Tanzania.

METHOD

This cross-sectional study was conducted from September to October 2017 at Songea Regional Referral Hospital. A total of 802 patients who met the inclusion criteria were recruited from those attending the outpatient department. Inclusion criteria were: age 18-64 years, resident in the study area and consent to participate. Data on socio-demographic characteristics and risk factors for hypertension were collected by questionnaire.

All patients underwent physical examination. Body weight, height, hip and waist circumferences were measured, and the mean of two blood pressure (BP) records were obtained. The participant was regarded hypertensive if the systolic BP was >140 mmHg or diastolic BP was >90 mmHg or had reported regular use of antihypertensive drugs. All patients were classified as normotensive (systolic blood pressure (SBP) ≤120mmHg and diastolic blood pressure (DBP)<80mmHg), pre-hypertensive (SBP 120–139 and DBP 80–89mmHg), hypertension stage 1 (SBP 140–159 mmHg and DBP 90–99mmHg) or hypertension stage 2 (SBP≥160mmHg and DBP ≥100mmHg).[3]

The body-mass index (BMI) was calculated and patients classified as underweight (< 18.5 kg/m2), normal weight (≥18.5-24.9 kg/m2), overweight (≥25-29.9 kg/m2) or obese (≥ 30 kg/m2).

Recommended salt intake per day was defined as 6g or less while excessive salt intake was defined as> 6g (about one-teaspoonful) a day. For physical activity, patients were grouped: (1) vigorous physical activity, (2) moderate physical activity, (3) insufficient physical activity to meet vigorous or moderate levels, and (4) no physical activity.

Waist and hip circumferences were measured using flexible tape measure just above the iliac crest and at the maximum circumference of the hip, respectively. Waist-to-hip ratios of>1.0 for males and >0.85 for females were considered as abdominal obesity.

The study protocol was approved by the Internal Ethical Committee of Archbishop James University College. Permission to conduct the study was obtained from local and hospital authorities. Individual informed consent was obtained from patients

Statistical analyses were done using Statistical Package for Social Sciences version 24.0 (SPSS Inc., Chicago, IL, USA). Continuous data were expressed as means ± standard deviation (SD) and categorical data as percentages. Two-tailed Fisher's exact tests were used to assess the associations between different variables. Logistic regression analyses were done to assess predictors of hypertension. A p-value of <0.05 was considered statistically significant.

RESULTS

A total of 802 patients were enrolled: 48.3% were

Table 1. Socio-demographic, behavioural and clinical characteristics

Characteristics	n (%)
Sex	
Males	415(51.7)
Females	387(48.3)
Age (years)	
18 – 34	102(12.7)
35 – 44	161(20.1)
45 – 54	127(15.8)
55 – 64	234(29.2)
65+	178(22.2)
Mean ± SD	52.4±13.8
Marital status	
Married	388(48.4)
Cohabiting	68(8.5)
Single	132(16.5)
Widowed	172(21.4)
Divorced	42(5.2)
Residence	
Urban and semi-urban	491(61.2)
Rural	311(38.8)
Education level	
Informal	50(6.2)
Primary	500(62.3)
Secondary	221(27.6)
Tertiary	31(3.9)
Occupation	
Peasant	423(52.7)
Employed	214(26.7)
Business person	113(14.1)
Others	52(6.5)
Waist-to-hip ratio	
Men	
≤ 0.95	94(22.7)
0.96 – 0.99	259(62.4)
≥1.00	62(14.9)
Women	
≤ 0.80	211(54.5)
0.81 – 0.85	119(30.8)
≥ 0.86	57(14.7)

SD = Standard deviation

Body-mass index (kg/m2)	
< 18.5	155(19.3)
18.5 – 24.9	528(65.9)
25 – 29.9	81(10.1)
≥ 30	38(4.7)
Mean ± SD	19.5±3.8
Smoking status	
Current smokers	52(6.5)
Past smokers	69(8.6)
Non-smokers	681(84.9)
Alcohol consumption	
Current consumer	143(17.8)
Past consumer	274(34.2)
Never consumed	385(48.0)
Physical activity	
Vigorous	433(54.0)
Moderate	225(28.1)
Insufficient	127(15.8)
No activity	17(2.1)
Fruits consumption per week	
1 – 3 days	429(53.5)
≥4 days	294(36.6)
Not at all	79(9.9)
Salt consumption	
Recommended or less	608(75.8)
Excessive	194(24.2)
Consumption of vegetables per week	
1 – 3 days	158(19.7)
≥ 4 days	639(79.7)
Not at all	5(0.6)
Family history of hypertension	117(14.6)
Use of oral contraceptives (females)	36(4.5)
History of diabetes mellitus	63(7.9)
History of hypercholesterolemia	22(2.7)
Suffered from renal failure	9(1.1)
Suffered from heart failure	56(7.0)
Suffered from stroke	8(1.0)

females; 87% were aged above 35 years; the mean age was 52.4±13.8 years; 48.4% were married. Almost half (48.0%) had never consumed alcohol while 84.9% denied a history of smoking (Table 1).

A quarter (24.2%) reported excessive consumption of salt and 90.1% consumed fruits at least 1 - 3 days a week; 99.4% ate vegetables at least 1-3 times a week (Table 1). Above normal waist-to-hip ratios were found in 14.9% of males and 14.7% of females. The mean BMI was 19.5±3.8 kg/m2; 4.7% were classified as obese; 17.9% were classified as taking insufficient or no physical exercise (Table 1).

Of the 802 patients, 164 (20.4%) were hypertensive: 132(16.4%) and 32(4.0%) in stages 1 and 2 respectively (Table 2).

Among females, 21.4% were hypertensive compared to 19.5% of men (p=0.54). Hypertension was also associated with alcohol consumption, insufficient or no physical activity, and history of hypercholesterolemia (Table 3).

High BMI, smoking tobacco or using tobacco products, and coexisting history of diabetes mellitus were predictors of hypertension. Non-modifiable factors such as age and sex, and modifiable behaviours such as excessive alcohol and/or salt consumption and lack of adequate physical activity were not predictors of hypertension (Table 4).

DISCUSSION

The proportion of hypertensive patients attending the outpatient department was 20.4%. This is lower than that reported in hospital-based studies in Ethiopia[10] and South Angola[11] but twice that in another Ethiopian study.[12] The result is slightly lower than in community-based studies within Tanzania[6,7] but slightly higher than in North West Tanzania[13] and southern Ethiopia.[14] The differences may reflect variations in the occurrence of medical conditions associated with hypertension and also variations in the numbers of urban and rural patients in the studies.[10, 11]

We observed a prevalence (36.9%) of pre-hypertension similar to an observation in North West Tanzania where the overall prevalence rate (8.0%) of hypertension was lower.[13] Our findings show the public health burden facing both rural and urban Tanzania.

We observed an increase in the prevalence of hypertension asso¬ciated with age consistent with findings worldwide.[3,4,6,15] Several African studies have explored the association between gender and hypertension with varying findings.[14] We found the prevalence of hypertension was similar among males and females at 19.5% and 21.4% respectively agreeing with other reports.[10] The association with marital status was intriguing and needs further study to determine if this is a true association.

Table 2. Distribution of patients according to blood pressure categories

Variable	n	Normo-tensive (%)	Pre-hypertension (%)	Hypertension stage 1 (%)	Hypertension stage 2 (%)	Total hypertensive (%)
General population	802	42.7	36.9	16.4	4.0	20.4
SBP ± SD	802	119.4±7.2	131.6±5.8	147.4±6.3	161.2±3.2	150.5±4.0
DBP ± SD	802	76.2±5.9	83.1±3.5	93.5±1.7	101.5±2.6	94.6±1.5
Sex						
Male	415	43.3	37.2	14.3	5.2	19.5
Female	387	38.5	41.1	15.8	5.6	21.4
Age (years)						
18 – 44	263	47.7	37.5	10.6	4.2	14.8
45+	539	40.6	36.2	16.9	6.3	23.2

SBP =Systolic blood pressure; DBP= Diastolic blood pressure; SD= Standard deviation

Table 3. Prevalence of hypertension across socio-demographic, behavioural and clinical characteristics

Characteristics	n	Hypertension, n (%)		OR (95% CI)	p-value
		Normotensive	Hypertensive		
Sex					
Male	415	334(80.5)	81(19.5)	0.89(0.63 – 1.25)	0.54
Female	387	304(79.6)	83(21.4)		
Age (years)					
18 – 44	263	224(85.2)	39(14.8)	0.58(0.39 – 0.86)	0.01
45+	539	414(76.8)	125(23.2)		
Marital status					
Married	388	294(75.8)	94(24.2)	1.57(1.11 – 2.22)	0.01
Not married	414	344(83.1)	70(16.9)		
Education level					
≤Primary level	550	468(85.1)	82(14.9)	0.36(0.26 – 0.52)	<0.0001
> Primary level	252	170(67.5)	82(32.5)		
Occupation					
Self-employed*	588	490(83.3)	98(16.7)	0.45(0.31 – 0.64)	<0.0001
Civil servants	214	148(69.2)	66(30.8)		
Waist-to-hip ratio					
Men					
≤ 0.99	353	325(92.1)	28(7.9)	0.01(0.01 – 0.03)	<0.0001
≥1.00	62	9(14.5)	53(85.5)		
Women					
≤ 0.85	330	296(89.7)	34(10.3)	0.02(0.01 – 0.04)	<0.0001
≥ 0.86	57	8(14.0)	49(86.0)		

Body-mass index (kg/m2)					
≤ 24.9	683	544(79.6)	139(20.4)	0.96(0.60 – 1.55)	0.90
≥ 25	119	94(79.0)	25(21.0)		
Ever or still smoking					
Yes	121	100(82.4)	21(17.6)	0.79(0.48 – 1.31)	0.39
No	681	538(79.0)	143(21.0)		
Ever or still consuming alcohol					
Yes	417	345(82.7)	72(17.3)	0.66(0.47 – 0.94)	0.02
No	385	293(76.1)	92(23.9)		
Physical activity					
Vigorous or moderate	658	547(83.1)	111(16.9)	0.35(0.23 – 0.52)	<0.0001
Insufficient or no activity	144	91(63.2)	53(36.8)		
Fruits consumption per week					
At least 1-3 days	723	574(79.4)	149(20.6)	1.11(0.61 – 1.99)	0.77
None	79	64(81.0)	15(19.0)		
Salt consumption					
Excessive	194	136(70.1)	58(29.9)	2.02(1.39 – 2.93)	<0.001
Normal or minimal	608	502(82.6)	106(17.4)		
Family history of hypertension					
Yes	117	95(81.2)	22(18.8)	0.89(0.54 – 1.46)	0.71
No	685	543(79.3)	142(20.7)		
Use of oral contraceptives (females)					
Yes	36	29(80.6)	7(19.4)	0.94(0.40 – 2.18)	1.00
No	766	609(79.5)	157(20.5)		
History of diabetes mellitus					
Yes	63	53(84.1)	10(15.9)	0.72(0.36 – 1.44)	0.42
No	739	585(79.2)	154(20.8)		
History of hypercholesterolaemia					
Yes	22	6(27.3)	16(72.7)	11.39(4.38 – 29.60)	<0.0001
No	780	632(81.0)	148(19.0)		
History of renal failure					
Yes	9	66.7)6)	33.3)3)	1.96(0.49 – 7.93)	0.40
No	793	79.7)632)	20.3)161)		
History of heart failure					
Yes	56	78.6)44)	21.4)12)	1.07(0.55 – 2.07)	0.86
No	746	79.6)594)	20.4)152)		

Note: Self-employed included businesspersons, peasants and others; civil servants included employees in both public and private sectors.

OR = Odds Ratio; CI= Confidence Interval; SD= Standard deviation

Table 4. Logistic regression analysis of the selected risk factors for hypertension

Variable	AOR (95% CI)	p-value
Sex	0.94(0.31 – 2.81)	0.91
Age (years)	0.64(0.18 – 2.21)	0.47
Marital status	1.46(0.48 – 4.39)	0.50
Education level	0.36(0.12 – 1.12)	0.08
Occupation	0.51(0.16 – 1.64)	0.27
Body-mass index	2.73(0.89 – 11.01)	0.04
Smoking	3.70(0.99 – 13.81)	0.03
Alcohol consumption	0.64(0.21 – 1.94)	0.43
Physical activity	0.46(0.13 – 1.58)	0.23
Salt consumption	1.62(0.48 – 5.45)	0.44
Family history of hypertension	2.78(0.78 – 9.89)	0.13
History of diabetes mellitus	5.36(1.33 – 21.68)	0.02

AOR = Adjusted Odds Ratio; CI = Confidence Interval.

In this study, almost 15.0% of both male and female patients had higher than normal waist-to-hip-ratio: of these, 85.5% of males and 86.0% of females had high blood pressure. Furthermore, being overweight or obese was significantly associated with three times increased risk of hypertension), and this is consistent with findings reported in community-based studies in sub-Saharan Africa.[6,7,10]

It is a well-established that obesity is associated with accumulation of "bad" cholesterol in the blood vessels reducing the blood flow with consequent hypertension. Interplay of factors that include sodium retention and activation of the renin-angiotensin – aldosterone system tends to occur in obesity and additionally vessel wall inflammation and insulin resistance may promote changes in the vascular function resulting into hypertension.

In this study, a history of hypercholesterolemia was significantly associated with the occurrence of hypertension. Patients who gave a history of diabetes mellitus had a five times risk of developing hypertension. Similarly, having a history of smoking was associated with a four times increased risk of hypertension. On the contrary, alcohol consumption and family history of hypertension did not have significant risk of having hypertension. This surprising discrepancy might be due to the low frequency of individuals with these risk factors in the study population. Also, the judgment as to alcohol consumption by an individual is notoriously difficult.

This being a cross-sectional study precludes the determination of any causal-effect relationships between variables. Another limitation is that our data were obtained from a single centre and may not represent the general population of southern Tanzania. The fact that blood pressure measurements were taken on a single day is a further limitation. Also, importantly, the study assessed only demographic, behavioural and physical measurements; due to resources limitations, we did not do biochemical investigations which may have added further useful data.

CONCLUSION

In this study, almost one-fifth of the study population was hypertensive and another one-third were pre-hypertensive indicating a serious silent public health problem. Being overweight or obese, smoking tobacco, and a history of diabetes mellitus were predictors of hypertension. We recommend the promotion of health education about healthier life styles focusing on modifiable risk factors for hypertension.

Competing interests: None

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Teaching/Educational Resources

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Measles: South Sudan's battle against a preventable killer

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OVERVIEW

Worldwide, measles is a significant cause of preventable deaths among children below the age of five years. Globally, in 2015, it accounted for 134,200 deaths which was equivalent to 367 deaths daily or 15 deaths every hour.[1] The vast majority of these deaths occur in low-income countries, especially sub-Saharan Africa.

In South Sudan, measles epidemics contribute significantly to morbidity and mortality among the unvaccinated children who have the highest share of measles cases; the magnitude of the measles burden can be illustrated by the frequent countrywide outbreaks that affect many different parts of the country. These outbreaks claim many lives, as a result of fatal complications mainly due to pneumonia, gastroenteritis with severe dehydration and severe acute malnutrition. Children are the most vulnerable. Those who survive measles can suffer from the impact of the disease throughout the rest of their lives. Effects like visual impairment, and physical or mental disability can be a consequence of measles-related encephalitis/meningitis.

Given the high infectivity (90% of those exposed to the measles virus), potentially deadly complications (10 - 30% of cases), and lack of curative treatment, prevention remains the mainstay approach for measles control and elimination.

Access to standard health care, a strong surveillance and reporting system, sustainable and efficient routine immunization and high coverage (as high as 95%) during mass vaccination campaigns plus introduction of a second dose as part of routine immunization [2] are all prerequisites for a successful programme that aims at measles control and elimination. Unfortunately, there are many obstacles that hinder the aspiration of measles elimination. South Sudan seems to be some steps away from this dream.

The scope of the problem: Reflection on the 2018-2019 measles outbreaks

South Sudan is widely considered to be a nation that has suffered from a high prevalence of measles for a long time, both before and after independence. The eruption of civil war has led to a massive internal and external displacement of the population, with dire impact on health. One consequence was a further destruction of the already weak health system, with either no, or limited, access to healthcare, poor living conditions and food insecurity. All these factors have significantly increased the impact of measles on the country.

In the past two years, South Sudan has been hit by waves of confirmed measles outbreaks affecting 16 counties across the country. In addition, measles has contributed to about one-fifth of the total alerts related to epidemic-prone diseases.

In 2018, measles outbreaks were declared in nine counties of different states, and by the beginning of 2019, another seven were confirmed. Noticeably, areas with a high population density such as Internally Displaced People (IDP) camps, including major towns like Juba and Wau, constituted around 25% of the total areas. According to 2019 estimates, the vast majority (more than 85%) were children under the age of five years. Figures on case fatality were not consistently reported and probably did not fairly reflect the actual mortality rate. However, it is reasonable to consider multiple factors that could conceal the true figures including low access to health services (less than 50%) and poor infrastructure.[3]

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Figure 1. A child in Aweil receives a measles vaccination. (Credit William Davies)

A closer look into measles trends in 2018 and 2019, not only demonstrates the ongoing burden of the disease on South Sudan, but provides lessons and exposes challenges that hinder the very objectives of the South Sudan Measles Strategy. These lessons, when learned properly, can provide the basis for long-term solutions to the current problems that impede reducing measles-related child morbidity and mortality.

An ounce of prevention worth a pound of treatment: Immunizations are the best option

Acquired life-long immunity through vaccination has proved to be the most effective method of measles prevention.[2] The current measles' live attenuated vaccine, which has been in use for nearly half a century, is not only considered effective and safe but relatively inexpensive as one dose costs around one USD.

During 2000-2015, the global reported measles incidence declined by 75% from 146 to 35 cases per million population. In 2015, there were an estimated 134.200 Measles deaths globally, represented 79% decline since 2000.[4] All countries have to focus on strong routine immunization programmes and regular mass immunization campaigns to catch-up non-vaccinated children or/and deliver a second dose as their strategy to control and eliminate the disease.

South Sudan, together with international health partners, has been working hard to achieve its universal goal of reducing child mortality with measles control being one of its pillars. Despite the exerted efforts, South Sudan has many challenges to tackle on its way towards attaining the three milestones set by World Health Organization in 2010, to be achieved in 2015. These are:

- increasing routine coverage with the first dose of measles-containing vaccine (MCV1) by more than 90% nationally, and more than 80% in every district,
- reducing and maintaining annual measles incidence to less than 5 cases per million, and
- reducing estimated measles mortality by more than 95% from the 2000 estimate.

According to South Sudan EPI Vaccination Coverage Survey in 2017, only 18.9% of children aged 12-23 months had completed their vaccinations before their first birthday (measles vaccination is scheduled at age 9 months); the measles vaccine national coverage was 19.2% with the total routine immunization coverage being estimated as less than 50%. [5]

HURDLES TO MEASLES ELIMINATION IN SOUTH SUDAN: MSF EXPERIENCE IN AWEIL

In May 2019, Doctors Without Borders (MSF), in collaboration with the South Sudan National Ministry of Health, UN Agencies, and other international NGOs, conducted a reactive mass vaccination in response to a measles outbreak in Aweil Centre.[6] The target population was children aged 6-59 months in Aweil town and the neighbouring villages. The goal was to interrupt transmission and prevent possible further outbreaks. A total of 27,411 children were targeted, and 26,477 of them received measles vaccination with a coverage of 97%.

One concern of the campaign was the lack of recent and accurate statistics at the state level. The latest census was in 2011, and the population-related figures were obsolete. The target population of the campaign was based on either projections or simply outdated information. This raised a major concern about the actual estimated coverage.

During the vaccination response in Aweil, the team encountered several challenges, many of which are the same as are found generally in South Sudan's healthcare These included:

- Low access to healthcare, either due to scarcity of adequately equipped health facilities with immunization services, or parents traveling long distances in order to reach the nearest primary health care centre or unit. This was one of the major causes of poor routine vaccination.

- Weak surveillance and reporting system at all levels. This affects timely alert, declaration and response to outbreaks.
- Inadequate clinical case management mainly due to a lack of a sustainable drugs supply (for example, vitamin A which can improve immunity). This can contribute to an increase in morbidity and the case fatality rate.
- The lack of infrastructure, particularly during the rainy season, which is another factor that impedes the vaccination of children.

Security was not a concern during the May 2019 campaign in Aweil; however, at different points during the civil war, security has created serious access issues for the population.

Strengthening the public health sector and adequate distribution of easily accessible, well-resourced primary health care facilities, together with national investment and direct involvement in the expanded programme on immunization (EPI) response, and mass vaccination campaigns will, if achieved, positively contribute towards winning the battle against measles in South Sudan.

TO WIN THE BATTLE: AN INVESTMENT IN ROUTINE IMMUNIZATION AND OUTBREAK RESPONSE ARE THE KEYS TO SUCCESS

Despite the tangible improvement in reduction of deaths among children under-five years of age, South Sudan still leads in terms of child mortality. Measles control remains an important element in reducing these deaths. As the challenges are well known, and solutions seems to be straightforward, advocacy on dealing with the root cause of poor vaccination coverage is essential.

The priority now needs to be on improving the healthcare system with integrated and easily accessible and tailored immunization activities through the Expanded Programme on Immunization (EPI) services, introducing the second dose schedule, and reinforcing resources and training at counties/districts level to ensure a timely detection response to outbreaks.

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Figure 2. MSF staff in Aweil during the measles campaign. Santino Ruop Jok (Nurse aid), Anyama Stephen Agasi (Clinical Officer) and Yel Yel Anei (Medical interpreter). (Credit William Davies)

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Public health impacts and responses to floods

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INTRODUCTION

A flood, as defined by Merriam-Webster, is "a rising and overflowing of a body of water especially onto normally dry land". Flooding can occur when a river, lake or any body of water overflows its boundaries, or when heavy rains lead to accumulation of water in an already saturated area with no escape channels. These waters can rise quickly and rapidly – as in flash floods – or rise slowly over a long period of time. Floods can be local, impacting a small community, or very large, affecting entire river basins and regions.

Floods are happening more often than before around the world, as they have most recently in South Sudan. Here they have led to displacement of thousands of people in large parts of the country, and consequently to food shortages, hunger and malnutrition especially among children.[1] Elsewhere, drought and short rainy seasons are the other extreme conditions affecting communities worldwide. Climate change, which is partly attributed to global warming due to increased levels of CO_2 in the atmosphere, as well as phenomenon such as El Nino and La Nina are being blamed for these floods.

Floods cause disruption of farms, and destruction of homesteads and communities, as well as causing diseases and preventing access to health care services, which is a public health concern – the focus of this article.

PUBLIC HEALTH IMPACTS OF FLOODS

The effects of floods as a public health concern can be direct or indirect.[2]

Direct effects of floods

The direct effects of floods on communities can be classified as immediate, early or late.

a. Immediate effects

The immediate health effects of floods occur at the time of the floods or within days. Drowning during floods and deaths from injuries are of huge concern at this time. Drowning is generally dependent on either the occurrence of a flash flood or a flood of gradual onset. People drown in their vehicles or homes, or after being carried away by flood waters. Another immediate effect can be severe hypothermia.

b. Early effects

The early effects are defined as occurring within 10 days of the flood. The risk of infection, such as infected wounds and lacerations, is high at this stage. Adequate wound care, removal of foreign bodies and debridement of devitalized tissue may be sufficient, without the need for antifungal therapy, to prevent wound infection. In areas with poor hygiene and sanitation, typhoid, diarrhoeal diseases such as cholera and viral gastroenteritis can happen. Other disease like hepatitis A and E can occur.[2]

c. Late effects

Late effects occur after 10 days. The longer the flood waters stand, the likelier the occurrence of vector-borne infections like malaria and dengue fever, depending on the location. Lack of access to health care services and drugs for the management of noncommunicable diseases like diabetes and heart conditions can lead to deaths. Other conditions that are generally overlooked include mental health issues like post-traumatic depression.

Citation:
Kenyi. Public mpacts and responses to floods. South Sudan Medical Journal 2020; 13(1):22-23

Indirect effects of floods

The indirect effects of floods on health can result from destruction of the road infrastructure making it difficult for the emergency response to get to the flooded areas and help affected communities. Also, because farms and food reserves are destroyed, lack of food can lead to famine and malnutrition in the population.

PUBLIC HEALTH RESPONSES DURING FLOODS

The World Health Organization (WHO) details some key preventive immediate and long-term measures that can greatly reduce the risk of communicable diseases from floods, as summarized below.[3]

Short-term measures

Provision of clean drinking water: Because of contamination of water during floods, access to clean water is key in preventing diarrhoeal and other water-borne diseases. Distribution of chlorine tablets following floods ensures availability of clean drinking water.

Malaria prevention: Although mosquito numbers do not increase immediately during floods, preventive measures should be implemented early such as indoor residual spray and distribution of insecticide treated bed nets. Public health workers should monitor cases of malaria post-floods.

Vaccination against hepatitis: Vaccination of high-risk groups against hepatitis A, such as persons involved in the management of drinking water, waste water or sewage might be considered where relevant. During outbreaks of HepA, contacts of confirmed cases should also be vaccinated. WHO does not recommend mass immunization.

Health education: This should continue to promote good hygienic practice, ensure safe food preparation techniques and boiling or chlorination of water and early diagnosis and treatment of malaria.

Handling human remains: There is no evidence that corpses pose a risk of disease "epidemics" after natural disasters, according to WHO. However, "workers who routinely handle corpses may have a risk of contracting tuberculosis, bloodborne viruses (such as Hepatitis B/C and HIV), and gastrointestinal infections (such as rotavirus diarrhoea, salmonellosis, E. coli, typhoid/paratyphoid fevers, hepatitis A, shigellosis and cholera)".[3] The public and emergency workers alike should take adequate precautions when handling the dead.

Long term measures[3]

"Legislative/administrative issues:

- Create Disaster-Preparedness Programmes and Early Warning Systems.
- Improve surveillance on a local, national, international and global level.
- Promote tap-water quality regulation and monitoring.
- Enforce high standards of hygiene.

Technical issues:

- Improve water treatment and sanitation.
- Keep infectious disease control programmes active and efficient."

A MSF worker paddles a boat through floods in Pibor (Credit Samir Bol, MSF)

CONCLUSION

Floods are happening more frequently and becoming more severe over the past few years. Global warming is seen as a cause of the extreme weather patterns due in part to rising CO_2 levels in the atmosphere. Public health concerns of floods can be early, immediate or late. Drowning, communicable diseases and post-traumatic stress disorder can occur. The main public health responses to preventing communicable diseases should include the provision of safe drinking water and health education. Long term measures include creation of Disaster-Preparedness Programmes.

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Case Report: Necrotizing fasciitis of the neck with odontogenic origin

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Necrotizing fasciitis is a severe and rare infectious disease. There is extensive necrosis of subcutaneous tissues and fascia layers, and gangrene. To reduce mortality, a rapid diagnosis, aggressive surgical treatment, and appropriate antibiotic therapy are essential. Usually the underlying cause is dental and especially common in immunologically compromised patients.

This case report is an example managed by the authors.

Keywords: cervical necrotizing fasciitis, infection, immunology, depressed patients

INTRODUCTION

Necrotizing fasciitis is an uncommon condition arising from bacterial infection. It leads to skin and soft tissue destruction, affecting fascia that cover muscles and subcutaneous fat. Streptococcus pyogenes is a common cause but a number of other bacteria may be involved.[1-3]

Any part of the body may be affected. Common sites are the feet, lower legs, hands and genital regions (Fournier's gangrene). It also occurs in the mouth (Ludwig's angina) and neck region. The most susceptible individuals include those with: immunocompromise caused by HIV infection, chemotherapy, steroid treatment and radiotherapy; chronic diseases such as diabetes mellitus, cancer, liver or kidney diseases, malnutrition, and alcohol abuse.[4, 5]

CASE REPORT

A 23-year old male, who had no significant past medical or surgical history, was admitted to our Maxillofacial Department, having attended another hospital where a tracheostomy was performed. He had dysphagia, odynophagia, and a fever of 39°C. There was cervical necrosis on the right side extending over the midline to the left side and on to the clavicular region. These whole areas were painful to touch and swollen as was the face with palpable gaseous crepitus.

Oral endoscopy was difficult because of trismus and odontogenic infection in the left lower mandible. The colour changes on the skin of the neck; were caused by the presence of necrotic tissue, associated with a lot of pus and debris (Figure 1).

The results of investigations are shown in Table 1. The chest X-ray was normal; the pulse rate was 129 beats/min and blood pressure 70/40 mmHg.

The patient was prepared for emergency surgery. Meanwhile hydration therapy was instituted using Ringer lactate 500ml six times a day, until the patient clinically stabilized. Electrocardiogram was normal, apart from a tachycardia.

At surgery multiple bilateral cervical incisions were made from the inferior border of the mandible to the clavicles, including the parotid region and part of the cheek. All necrotic tissue was removed. Hydrogen peroxide and iodine solution were used to clean the areas. This procedure was carried out four times under general anaesthesia every second day, until the infection was controlled, based on blood tests results and clinical review of the wound. (Figures 2a and b). On admission

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Figure 1. Clinical appearance of the patient

Table 1. Blood test values

Tests	Results	Normal ranges
White Cells Count	13x 109/L	5 to 10 × 109/L
Neutrophils	80.0 %	40–70%
Haematocrit	34.30 %,	40 to 50%
Haemoglobin	10.1 g/dl	13.5 to 17.5 g/dl
Glucose	5.3 mmol/L	4.0 to 5.4 mmol/L
ESR	59 mm/hr	0 and 15 mm/hr
C reactive protein (CRP)	200mg/l	0-10.0 mg/l
Albumin	2.2g/l	3.4 -5.4 g/dl
Creatinine	1.1 mg/dL	0.6-1.2 mg/dl.
ALP	67	44-147 IU/l
GGT	24	9–48 U/l
Pulse Rate	129 b/min	60-100 b/min
Tests for hepatitis B (anti-HBs)	Non-reactive	Non-reactive/ Reactive
Tests for hepatitis C	Non-reactive	Non-reactive/ Reactive
HIV Rapid Test	Negative	Negative/Positive

the patient received broad spectrum antibiotic therapy consisting of meropenem 1g 3 times a day, vancomycin 1g 2 times a day and metronidazole 500mg 3 times a day. In addition, rehydration was continued, antipyretics: paracetamol 1g IV 4 times a day, vitamin C 200mg IV 3 times a day, and multivitamins intramuscularly were administered as well. Before antibiotic therapy, microbial cultures were taken and an antibiogram was performed. Empiric treatment was instituted. The microbiological examinations were negative, assuming these results could be wrong because there were not trained personal in the hospital to carry out these procedures. During the surgery, the cause of the infection (first and second molar on the lower jaw of the right hemi mandible) was removed and various samples were taken for pathological examination.

The patient was monitored with blood tests (showing CRP decreased to 15 mg/l, neutrophils to 11%), and clinical progression watched. Daily dressing was continued without anaesthesia once the infection was controlled and all the necrotic tissue removed.

CT scanning was done 8 days after admission, when the patient was stable and controlled, excluding other source of infection, such as: sinusitis, parapharyngeal space abscess, peritonsillar abscess, submandibular gland abscess, abscessed lymph node.

The cervical and thoracic regions revealed the subcutaneous tissue was extensively oedematous. Multiple lymph nodes were visible in the submandibular spaces. A right submandibular gland was oedematous, caused by the infection. The thoracic images with and without contrast medium were normal.

The clinical parameters improved with the antibiotic therapy, hydration and debridements.

The tracheostomy tube was removed after the second surgery, because the patient was able to breathe normally.

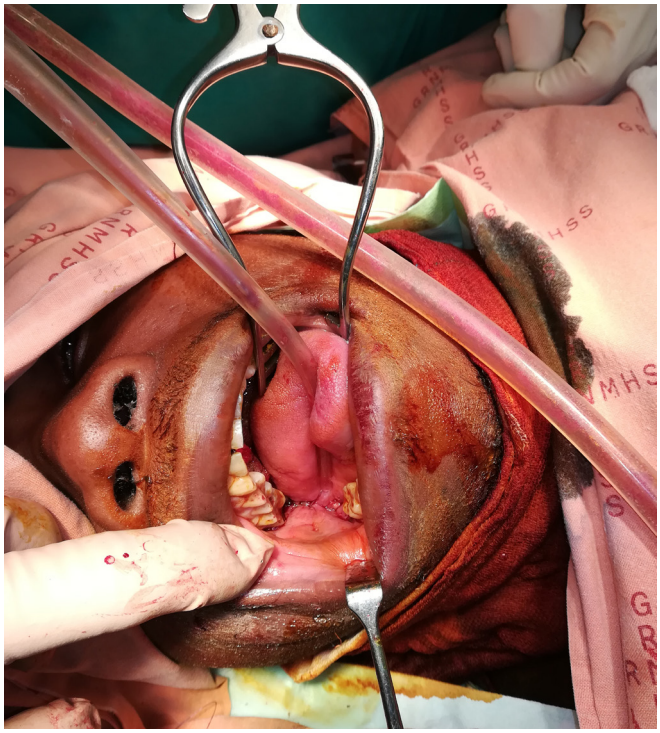
Healthy granulation tissue grew satisfactorily over the operative site and the tracheostomy healed (Figure 3). Skin grafting was carried out after 20 days of the first surgery, when there were no signs of infections and there was enough granulation tissue. (Figure 4)

The patient wore a cervical collar for two months to prevent wound retraction.

After the second week of being grafted, the patient was discharged and follow-up arranged.

DISCUSSION

There are few case reports of cervical necrotizing fasciitis. [6] Although immunocompromised patients are at increased risk of developing this condition our patient was not immunocompromised. [1, 3, 5] The causative organism may be a single agent, commonly Group A β-haemolytic streptococcus or staphylococcus aureus



Figures 2a and b. Necrectomy debridement and dental extractions.

or may be a polymicrobial involving Gram-positive and Gram-negative aerobic and anaerobic bacteria and fungi. However, many authors have failed to identify any organisms on culture.[6]

Initially, there is cellulitis extending into the deeper tissues. Clinically, there is cutaneous erythema and oedema. As necrosis increases more bacterial flora gain access. This bacterial overgrowth reduces oxygen tension causing local ischaemia and proliferation of anaerobic organisms. In 4-5 days, gangrene becomes evident and after 8-10 days necrotic tissue separates.[6, 7]

As the disease progresses, signs of necrotizing fasciitis appear "…a dusky discoloration of skin appearing as small purplish patches with ill-defined borders. Concomitantly blisters or bullae of a few millimetres in diameter appear on the skin of the involved area. The skin beneath blisters becomes necrotic and blue in colour. Localized necrosis of skin is secondary to thrombosis of nutrient vessels as they pass through the zone of involved fascia."[7, 8]

Cervical necrotizing fasciitis of dental origin commonly involves the mandibular second and third molars, as the apices of these teeth extend below the mylohyoid muscle insertion. Infection from these teeth easily extends into the submandibular space. In our case, the maxillary second molar was the infection focus, which was consistent with findings of many authors.[9]

Necrotizing fasciitis of dental origin invades deep tissue planes in the early stage. It is only when the infection reaches the superficial fascia, spread becomes rapid and the typical features of necrotizing fasciitis appear. This mode of presentation can be misleading to the unsuspecting clinician, making early diagnosis difficult.[10]

However, some findings may present clinically when suspecting cervical necrotizing fasciitis:

1. Odontogenic infection that spreads to neck and anterior chest.
2. Accumulation of gas in the tissue.
3. Very rapid progression of infection.
4. "Orange peel" appearance of the involved skin which changes to a dusky discoloration.

Overlying oedematous tissue or the absence of gas may obscure subcutaneous crepitus

The key to prompt diagnosis of necrotizing fasciitis and institution of urgent treatment depend on a thorough clinical history and examination and the clinician having a high index of suspicion.[11]

The cornerstone of treatment is surgical debridement. All necrotic tissue must be removed to healthy bleeding tissue. Reluctance to debride facial soft tissues adequately, hoping to avoid unsightly disfigurement often leads to under treatment. Multiple surgical debridements are usually needed.[12]

Meropenem, vancomycin and metronidazole, was the triple therapy chosen because in our experience good results have been obtained. This antibiotic regime also

Figure 3. Surgical defect ready for grafting

Figure 4. Skin graft

covers most of the micro-organisms known to be associated with necrotising fasciitis. However, the most important action is to bring the patient to surgery as soon as possible to control and eliminate the source of infection, that is to remove all the necrotic tissue plus extraction of the causative tooth.

On the other hand, the use of vitamin c it is demonstrated to have a good result in the satisfactory progression of the disease since this vitamin acts like an antioxidant, which is very important, since during infection, a lot of toxins are released into the blood stream. Multivitamins are used as a supplementary to increase and help immune responses. [12-14]

Povidine-iodine (Bethadine), a complex of iodine, the bactericidal component, with polyvinylpyrrolidone (povidone), a synthetic polymer Povidone-iodine, without the detergent, is distributed most commonly as a 10% solution. When diluted to a 1% concentration or lower, it can be applied safely to wounds retaining its bactericidal activity.

Hydrogen peroxide (3% H2O2) was used to clean wounds With advances in research, H2O2 at µM levels has been reported to act as a signalling molecule which drives redox-sensitive signalling mechanisms to improve dermal wound healing.[13-15]

After surgical debridement, wounds are left open and packed with povidine moisturized gauze, which is changed frequently. It is important to prevent pooling of secretions in the wound that may provide a culture medium for further bacterial growth. Along with debridement, appropriate antibiotic coverage is imperative.[14, 15]

Hyperbaric oxygen therapy has gained support as an adjunctive treatment for necrotizing fasciitis. Published reports cite a 50% reduction in mortality when this is used along with surgery,[5] but its role in necrotizing fasciitis has been questioned by other authors.[14]

Once the infection has been resolved, the defect can initially be covered with a split thickness skin graft and reconstructed secondarily by advancement flaps or revascularized free flaps if necessary.[15]

CONCLUSION

Cervical necrotising fasciitis is an uncommon, life-threatening disease which can present with deceptively innocuous symptoms and signs. Early diagnosis and aggressive management are critical to reducing the associated morbidity and mortality.

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All images by Ernesto Carmona Fernández. The patient gave consent for his information and images to be published in SSMJ.

The Double Burden of Malnutrition

The double burden of malnutrition is the coexistence of overnutrition (overweight and obesity) alongside undernutrition (stunting and wasting), at all levels of the population—country, city, community, household, and individual. On December 16th 2019 The Lancet published a four-paper series which explores how this coexistence is affecting low-income and middle-income countries.

Malnutrition in its many forms has previously been understood and approached as a separate public health issue, but the new emergent reality is that undernutrition and overnutrition are interconnected and, therefore, double-duty actions that simultaneously address more than one dimension must be implemented for policy solutions to be effective. In addition to policy recommendations, the Series includes a focus on both historical and biological contexts, and new economic analysis.

See: https://www.thelancet.com/series/double-burden-malnutrition

Scurvy among young male South Sudanese refugees in Kakuma camp: Summary

In 2018, several adolescent and young adult male South Sudanese refugees in Kakuma camp presented with lower limb pain and swelling, lethargy, fatigue, gingival swelling and pain, hyperkeratotic skin changes, and chest pain. For some the limb pain was severe enough to prevent them attending school and playing football (the highlights of their day). Scurvy was suspected and all cases improved when given vitamin C.

Scurvy, which is rare outside refugee camps, was confirmed by a team from the Centers for Disease Control and Prevention who, on behalf of UNHCR, examined the causes of the outbreak. From 2015 there were shortages of food assistance in the camp and a smaller food ration was issued consisting of cereal, pulses, fortified corn-soy blend (CSB+) and vitamin A-fortified oil; electronic cash was given so refugees could buy additional foods to improve dietary diversification. However, rather than purchasing fresh foods rich in vitamin C, the investigation found that those affected with scurvy had selected more calorie-dense cereal and pulses to supplement the energy-deficient food ration.

The suspected scurvy cases occurred in young males whose dietary requirements are high. In addition to the ration being inadequate for this age group, it was found that the retention of vitamin C in cooked CSB+ was lower than expected. Many of the young males in the camp were living and cooking together, often without a female, and were likely to be poorly informed about the need for a diverse diet.

Based on an article in Field Exchange #61 2019 https://www.ennonline.net/fex/61/scurvyoutbreakkenya

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International Medical Corps strengthens nutrition alert and surveillance systems in South Sudan

In 2015 International Medical Corps (IMC) established a Nutrition Alert and Surveillance Strengthening (NASS) team to support the Food Security and Nutrition Monitoring System (FSNMS), the primary national information system, and Integrated Food Security Phase Classification (IPC), and by January 2019, 52 multiple-type surveys had been conducted in IMC operational and non-operational areas to inform IPC analysis and programme interventions. Lessons learned include the need for thorough planning and preparation pre-survey; good communication and coordination within and outside the organisation; investment in team capacity-building and supervision for collection of high-quality data; and the necessity for a multi-sector approach in data analysis. The 2019-2021 strategy includes plans to further build the capacity of the IMC surveillance team; mobilise funds for a centralised, online surveillance data hub; increase support for country-wide surveys; and introduce cost-recovery for surveys in IMC non-operational areas.

See full article at https://www.ennonline.net/fex/61/internationalmedicalcorps

Call for Submissions

Malaria Special Issue November 2020

SSMJ is making a call for submissions for a jumbo special issue of the journal dedicated to discussing malaria in November 2020.

SSMJ welcomes original research, reviews, summaries and letters to the editor related to the fight against malaria in South Sudan, Africa and the world. We expect to include, but will not be limited to:

- Diagnosis in resource poor countries
- Recent advances in the diagnosis and management of malaria
- Malaria in pregnancy
- Malaria in children
- Malaria in adults
- Malaria prevention strategies
- Vaccination against malaria: feasibility and cost effectiveness
- Malaria epidemiology

By making recent information on Malaria available to health staff throughout South Sudan, we hope this issue will help to prevent Malaria, improve treatment/management of Malaria and reduce deaths from Malaria, especially among children.

Join us in fighting Malaria in South Sudan by sending your ideas, news stories, research papers and clinical guidelines for this special issue to admin@southernsudanmedicaljournal.com.

All manuscripts must be received by SSMJ not later than **May 1, 2020.** Authors must follow the Author's Guidelines and the SSMJ team will work with authors of accepted manuscripts in revising and finalizing their work for publication. Send your articles to the Editor-in-Chief at admin@southernsudanmedicaljournal.com. Encourage your peers to publish with us.