SSMJ South Sudan Medical Journal

Volume 6. Number 1. February 2013 www.southsudanmedicaljournal.com

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Obstructed labour: when the baby has not come

Pathophysiology and microbiology of TB

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Updated WHO IPT recommendation

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Cover photo: *Mary Adhiew Manut, innoculator, Patiou Primary Health Care Unit (PHCU) Piol, South Sudan (north of Bor) May 2012. Supported by CARE International and Scioto Ridge United Methodist Church, Columbus, Ohio USA. (credit Andrew J. Simmonds).*

SSMJ would like to thank the United Kingdom Department for International Development (DFID) for supporting printing of this journal for free distribution.

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Volume 6. No. 1. www.southsudanmedicaljournal.com

A Publication of the South Sudan Doctors' Association

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.

Reviewers are listed on the website

The SSMJ Website, Blog and Facebook Group

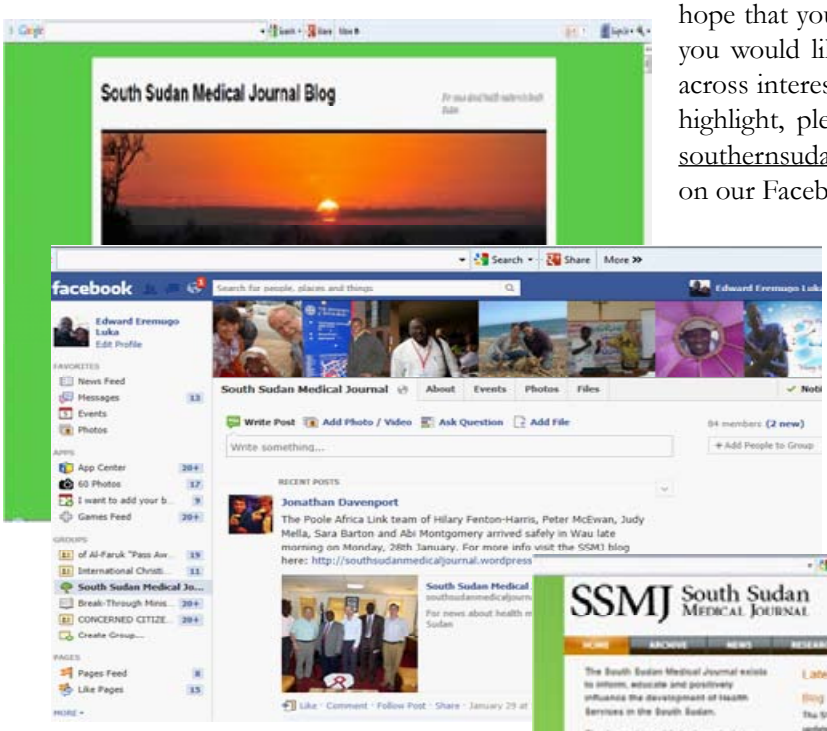
Jon Davenport

The South Sudan Medical Journal (SSMJ) blog http://southsudanmedicaljournal.wordpress.com has been running for over a year, and during this time its readership has increased massively. With over 500 views a month we are able to promote the work of the SSMJ and provide health news from South Sudan.

By signing up to the SSMJ blog by clicking the 'Follow' button and entering your e-mail address you will automatically be informed of new posts and when the latest SSMJ issue has been published. In addition we provide firsthand accounts from medical and health professionals working or teaching in South Sudan. These reports are eye opening and discuss the challenges faced by staff, as well as demonstrating incredible medical improvements and new ways of thinking. Recent blog posts from Dr David Attwood, who was teaching in South Sudan, demonstrate how the Juba Teaching Hospital is going from strength to strength.

To compliment the blog we have also set up a Facebook group called simply the 'South Sudan Medical Journal' - see www.facebook.com/groups/174154965991358. We hope that members will use the group as a forum to discuss ideas and for people with similar professional interests to exchange information. The group can also be used by doctors and nurses working in South Sudan to inform colleagues and friends about how they are getting on.

To keep both the blog and Facebook group relevant they rely on the support of readers, and so we are always looking for health related articles as well as up-to-date news to share. We hope that you will visit the blog and Facebook group. If you would like to contribute any articles or have come across interesting news reports that you think we should highlight, please get in touch, either by emailing jon@southernsudanmedicaljournal.com or posting information on our Facebook group.



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Hypertension in Juba, South Sudan

A retrospective cohort study of single blood pressure readings among potential blood donors at Juba Teaching Hospital 2010-2012

Rachel Wake[a] BM and Charles Mazinda[b] BSc

Abstract

South Sudan is thought to be undergoing an epidemiological transition with an increasing burden of non-communicable diseases such as hypertension. No current data exist on the prevalence of these diseases. Blood pressure readings of 5660 blood donors during 2010-12 at Juba Teaching Hospital were analysed. Prevalence of hypertension was 19.3%, positively associated with older age and being male. This has implications for public health policy, indicating a need for prevention, screening and treatment to prevent complications of hypertension.

Background

Throughout sub-Saharan Africa, evidence exists that hypertension is prevalent, increasing, under-recognized and under-treated [1]. Complications such as cardiovascular disease, stroke and renal failure are costly both to patients and to health systems that are already under strain. Building a body of data on the prevalence of hypertension in these countries is of fundamental importance for planning preventative interventions and health services. In South Sudan, no such data currently exist.

Although hypertension remains more prevalent in economically developed countries (37.3%) compared to developing nations (22.9%), it is a much bigger problem in developing countries, in terms of actual numbers, awareness, treatment and complications [1]. Prevalence is also rising more rapidly across developing countries where it is estimated that three quarters (1.17 billion) of cases will exist by 2025 [1]. Recent studies from African countries have shown prevalence to be 15-50%, and higher in urban than in rural populations [2].

Although no data exist from South Sudanese populations, a study in Khartoum in 1990 estimated prevalence to be 7.5%, with a positive correlation between blood pressure and age, weight, body mass index and duration of urban residence [3]. More recently, data from the Sudan Household Survey in 2006 and STEPS survey of chronic disease risk factors in Khartoum found hypertension prevalence to be 20.1% and 20.4% respectively [4]. Of concern are the poor rates of knowledge and control of hypertension in sub-Saharan Africa. A systematic review of 25 studies across the region found that less than 40% of people knew they were hypertensive, less than 30% were on treatment and less than 20% of those on treatment had a controlled blood pressure [5]. In Kassala, Eastern Sudan, knowledge of hypertension was poor, compliance with anti-hypertensive drug treatment was 59%, and 36.8% said they could not afford to buy the drugs they were prescribed [6].

A recent article in the Sudan Tribune warned that rising levels of non-communicable diseases and an ageing population will have major implications for health and socio-economic development in the world's newest nation [7]. This study aims to estimate the prevalence of hypertension at Juba Teaching Hospital. These data will inform health-workers, public health officials and policy makers about the extent of the problem, and the need for screening, prevention and control measures.

Method

This is a retrospective cohort study of routine one-off blood pressure readings taken from potential blood donors at Juba Teaching Hospital from January 2010 until March 2012. People are eligible for blood donation if they are aged 18-45, reported feeling well at the time of donation, are not pregnant or lactating, with a haemoglobin of >12g/dl, weight of >50kg and systolic blood pressure of 90-140 mmHg. Blood is also screened for transmissible infections: HIV, hepatitis B and C and syphilis. Screening is performed in the blood bank by laboratory staff and records are kept of screening results for every potential donor who comes to donate. Blood pressure readings are taken prior to donation with a mercury sphygmomanometer. Potential donors are asked to sit quietly while their blood pressure is taken. The reading is then recorded in a book. The results of blood screening for infectious diseases are kept confidential by recording them next to an identification number allotted to each patient, and kept in a separate book.

The records for the time period January 2010 to March 2012 were reviewed and data including age, sex, infection

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screening results, haemoglobin, weight and blood pressure were imported to a Microsoft Excel (Microsoft, Redmond, WA, USA) sheet. No donor identifier information was recorded. Hypertension was classified as a systolic blood pressure >140 and/or a diastolic blood pressure >90. Data were analysed to calculate the prevalence of hypertension within this population and to compare prevalence amongst different age-groups.

Ethical approval was given by the South Sudan Ethics Board for a study analysing infection rates with HIV, hepatitis and syphilis in this cohort. While data were collected for this study attention was drawn to blood pressure readings that were also recorded. Permission was then given for carrying out a sub-analysis on the prevalence of hypertension in the population.

Setting

Juba Teaching Hospital is a 500+ bed tertiary referral hospital in South Sudan's capital city, Juba. The hospital has medical, surgical, obstetrics and gynaecology and paediatric departments. Blood transfusion is often necessary in emergencies for obstetric complications, trauma cases, gastro-intestinal bleeding and for babies with anaemia and decompensated heart failure. Urgent blood transfusions are also frequently requested for patients with severe anaemia (<5g/dl), which is common due to malaria, malnutrition and chronic disease.

South Sudan is urbanizing rapidly. The city of Juba had an estimated population of 250,000 in 2005, which was expected to double over the following 5 years [8]. Urbanization has consistently been found to be associated with rising levels of hypertension throughout sub-Saharan Africa [2].

Population

The people who volunteer for donation are mainly male relatives of patients admitted to the hospital. The majority are from Juba or surrounding areas (anecdotal evidence). A scheme to encourage donors among the 'ex-patriate' community in Juba was in operation since November 2011 which screened 67 donors during the period studied. All ex-patriate donors were normotensive.

Results

Blood bank records from January 2010 to March 2012 recorded that 7556 potential donors were screened for blood donation, an average of 280 per month. Blood pressure readings were recorded from 5660 potential donors (others were not done due to the person being unsuitable for blood donation, or were not recorded). The population screened for hypertension were mostly male (98%), with a mean average age of 31 years (SD 9.13, range 15-75).

Hypertension (BP >140/90) was recorded in 1093/5660 (19.3%) of people screened with one blood pressure reading prior to blood donation

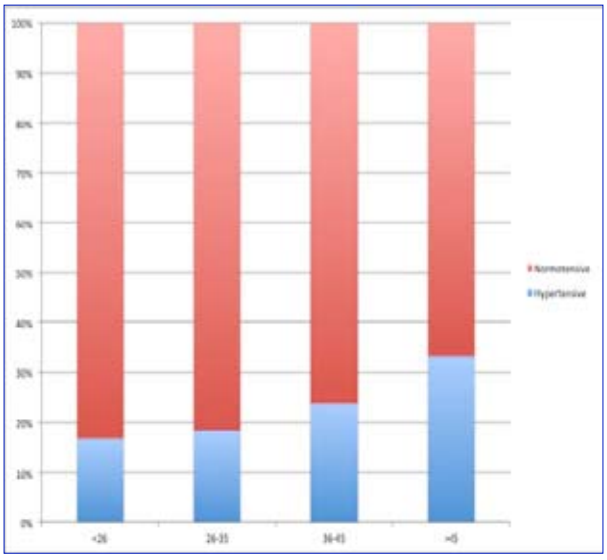

Figure 1. Prevalence of hypertension within different age-groups

Prevalence of hypertension among different age groups was calculated (Figure 1). In donors aged 25 and under, prevalence was 324/1935 (16.7%), in 26-34 year olds 436/2363 (18.5%) and in those aged 35 and over, 346/1359 (25.5%). The mean age of donors with a high blood pressure reading was 31.4 years (SD 8.7) compared to 29.2 years (SD 7.48) with a normal reading. Hypertension was significantly associated with age on Chi-squared testing ($p<0.001$).

Of all donors who had a blood pressure reading (n=5660), 5544 (98%) were male and 114 were female (two donors had no sex recorded and were excluded from the age-analysis). Hypertension was prevalent in 19.5% of the men who were screened and 9.6% of the women. Hypertension was found to be significantly associated with male gender on Chi-squared testing ($p = 0.008$).

Discussion

Hypertension is likely to pose a significant public health problem in South Sudan. The prevalence of hypertension in this cohort (19.3%) was similar to that found in neighbouring Sudan in 2006 (20.1-20.4%) [4], but not as high as that reported in rural Uganda (30.5%, with a 95% confidence interval of 26.6-34.3%) [9]. As found elsewhere in sub-Saharan Africa [5], it is significantly associated with older age and being male.

This is the first report of hypertension prevalence in South Sudan and it is therefore not possible to determine if it is increasing or remains stable. It is likely however, that this relatively high prevalence rate is related to urbanization and the related change in lifestyle within South Sudan, which would suggest that prevalence is increasing.

Although these data give a useful estimate of the prevalence of hypertension in South Sudan, it is a retrospective opportunistic study, which introduces some bias to the sample. For example, the fact that this was a self-selected cohort of people wishing to donate blood means that it is a mainly male and healthy population. Many of those not eligible to give blood (for example, they were underweight or anaemic), will not have been screened for hypertension.

There were also some donors recruited from the largely expatriate NGO community in Juba that could not be excluded since it was not possible to identify them from the donor screening records. However, this is not likely to have influenced results significantly as it was a relatively small number (n=67). Only one blood pressure reading was used, which may have been influenced by anxiety concerning blood donation. Although screening was done in an urban hospital, it is not known whether the donors originate from urban, semi-urban or rural areas. It is also not known what other risk factors (other than age and sex) were associated with hypertension in this population, or the percentage who previously knew they were hypertensive and were on medication.

These would be interesting areas for further research in a prospective multi-centre study using a targeted questionnaire to gain a more accurate estimate, to analyse significant associations and any difference between urban and rural areas in South Sudan. The prevalence of associated risk factors for heart disease such as diabetes and hypercholesterolaemia in South Sudan would also be an important focus of future studies.

Although these data are likely to incorporate some bias as discussed, the results are very concerning. Evidence from Sudan [6] found low levels of screening for hypertension, initiation or continuation of treatment and of treatment success. This was largely due to a lack of awareness and understanding about the risks associated with hypertension, and patients being unable to access or afford medical treatment. A similar situation is likely to exist in South Sudan. Untreated hypertension is associated with risks of heart disease, peripheral vascular disease, stroke, eye disease and renal failure. A study in Kinshasa, Democratic Republic of Congo found more than 10% of the population to exhibit signs of chronic kidney disease and that hypertension was independently associated [10]. These complications of hypertension are already prevalent in South Sudan causing high levels of morbidity and mortality and an increasing financial burden on the health service.

The health sector in South Sudan is currently making a transition from providing an 'emergency response' to conflict and infection-related health problems, to one that provides a more holistic and sustainable service. In doing this, health policy makers must consider the parallel epidemiological transition that is occurring. As has been witnessed in many other sub-Saharan countries [11], South Sudan is likely to be developing a double burden of disease, with infectious diseases remaining the main cause of morbidity and mortality but non-communicable diseases becoming more prevalent. It is imperative that blood pressure screening takes place, that hypertension cases are identified, treated and followed up, and that the population is informed about prevention and risks associated with the condition. Without public health interventions such as these, the problem of hypertension will continue to increase, causing chronic debilitating disease, high mortality rates and a growing financial burden on the health sector in South Sudan.

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The baby has not come: obstructed labour

Nancy MacKeith[a] and Wal Bichiok Wur[b]

Introduction

This article is about how to recognize obstructed labour and deal with it in a way that preserves the life and health of mother and child. It is for midwives and others who work in maternity care and is based on our experiences in Yei, South Sudan. Obstructed labour means that the baby is too big to pass through the birth canal. It can be associated with prolonged labour. Prolonged labour can sometimes be treated, resulting in a normal delivery but a woman in true obstructed labour should be delivered by Caesarean section.

Predisposing factors to obstructed labour

Obstructed labour occurs either because the birth canal is small for the baby, the baby is too big for the birth canal or the position of the presenting head make it difficult for the baby to be born.

The pelvis of a woman can be small or she can have an abnormal pelvis if she:

- has had rickets due to lack of vitamin D while she was growing
- has had an illness like polio
- a serious road traffic accident damaging pelvic structures.

The baby may have problems such as hydrocephalus. If there are twins they may be locked in a position that does not allow them to deliver one after the other.

When a woman has had several pregnancies there is a greatly increased possibility that the 'lie' (position) of the baby will not be longitudinal (vertical in the uterus whether it is head up or down) but transverse (across the abdomen making natural delivery almost impossible). Therefore palpation or feeling the baby in the abdomen is an essential part of antenatal and labour care. Those with a transverse lie must go to hospital.

The position of the head can adversely affect the progress of labour. If it is tilted (asynclitic) or erect instead of flexed (this is sometimes called military!) the head will not stimulate regular effective contractions. During training midwives should learn all the possible positions of the head and how to feel for them.

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Figure 1. Ladies at the new ante-natal clinic (credit Nancy MacKeith)

The new antenatal card (Figure 2) records a woman's past medical and obstetric history. It includes a Birth Plan which provides an opportunity for discussing possible problems at the earliest opportunity. If the problem is well established during pregnancy an elective Caesarean section before labour is possible. Figure 3 shows a woman of short stature who has just had her second elective section and so has two healthy children.

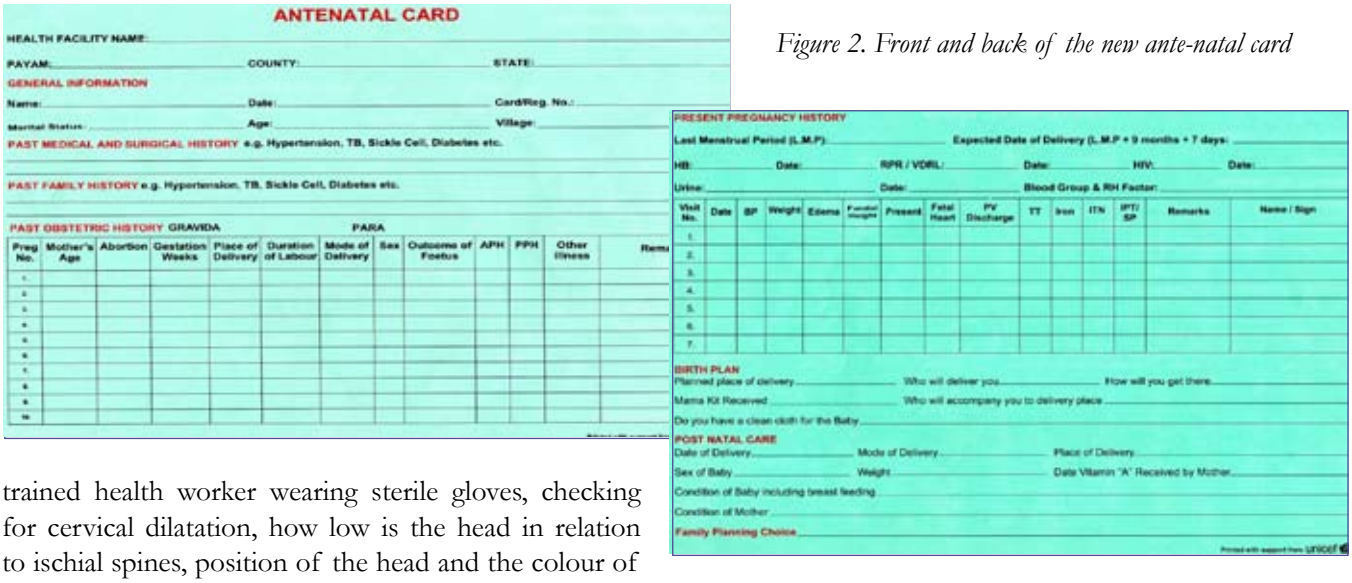
Clinical features of obstructed labour

A woman is probably in obstructed labour if she has been laboring for twelve hours with strong regular contractions with no progression to delivery (prolonged labour). She will be exhausted and there will be poor descent of the head even if the cervix is dilated. Palpation of the abdomen may reveal unusual shapes and the head still out of the pelvis. The woman will be tired, dehydrated, exhausted and might not have passed urine for many hours. Her urine may be bloodstained.

Evaluation of a woman with obstructed labour

Enquire about how long she has been in labour, frequency of contractions, if there is any bleeding from the vagina and the colour of her liquor. Is the baby still moving? You need to palpate her abdomen for the shape of the uterus, lie of the baby and check if you can feel the head above the pelvis. Listen to the fetal heart beats and count the rate.

Vaginal examination needs to be performed, by a


ANTENATAL CARD

HEALTH FACILITY NAME:

PAYAM: COUNTY: STATE:

GENERAL INFORMATION

Name: Date: Card/Reg. No.:

Marital Status: Age: Village:

PAST MEDICAL AND SURGICAL HISTORY e.g. Hypertension, TB, Sickle Cell, Diabetes etc.

PAST FAMILY HISTORY e.g. Hypertension, TB, Sickle Cell, Diabetes etc.

PAST OBSTETRIC HISTORY GRAVIDA: PARA:

Preg No.	Mother's Age	Abortion	Gestation Weeks	Place of Delivery	Duration of Labour	Mode of Delivery	Sex	Outcome of Foetus	APH	PPH	Other Illness	Remarks
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												

PRESENT PREGNANCY HISTORY

Last Menstrual Period (L.M.P): Expected Date of Delivery (L.M.P + 9 months + 7 days):

HB: Date: RPR / VDRL: Date: HIV: Date:

Urine: Date: Blood Group & RH Factor:

Visit No.	Date	BP	Weight	Edema	Fundal Height	Presentation	Fetal Heart	PV Discharge	TT	Iron	ITN	IPT/ SP	Remarks	Name / Sign
1.														
2.														
3.														
4.														
5.														
6.														
7.														

BIRTH PLAN

Planned place of delivery: Who will deliver you: How will you get there:

Mama Kit Received: Who will accompany you to delivery place:

Do you have a clean cloth for the Baby:

POST NATAL CARE

Date of Delivery: Mode of Delivery: Place of Delivery:

Sex of Baby: Weight: Date Vitamin "A" Received by Mother:

Condition of Baby including breast feeding:

Condition of Mother:

Family Planning Choice:

Printed with support from unicef

Figure 2. Front and back of the new ante-natal card

trained health worker wearing sterile gloves, checking for cervical dilatation, how low is the head in relation to ischial spines, position of the head and the colour of liquor. However, obstructed labour can be diagnosed from the history and palpation at least enough to refer the woman to hospital. If this is not available, the woman's obstetric history and palpation can give a good enough diagnosis of obstructed labour to refer the woman to hospital. Skilled staff such as midwives in primary health care centres and hospitals can use the partograph so that they are aware of problems in good time.

How to use the partograph:

- Record the baby's heartbeat every fifteen minutes. If the heartbeat is not regular and not between 120 and 160 beats per minute seek expert obstetric advice.
- Record if membranes have ruptured and, if they have, record the colour of the liquor (amniotic fluid).
- Plot cervical dilation and descent of the head on a graph. If the line of cervical dilatation crosses the 'alert' line health staff should watch the labouring woman more carefully. If the 'action' line is crossed the woman needs expert obstetric intervention.
- Record the mother's blood pressure, pulse rate and temperature.
- Check the bladder is empty – this is important to allow labour to progress – and then record output.

Management of possible obstructed labour at the hospital

Four regular contractions every ten minutes is a good definition of labour. If contractions are not regular and strong, health staff should aim to get the woman into true labour by amniotomy and/or giving oxytocin infusion. The National Institute of Clinical Excellence in the United Kingdom [1] states that this is being done with varying combinations of timing and dose hence the best regime remains uncertain. A doctor should decide whether it is worth still trying for a normal delivery before starting oxytocin infusion as there are associated risks such as overstimulation of the uterus and uterine rupture.

Oxytocin may overstimulate the uterus thus putting the baby through too many contractions in a short time so there is not enough time between contractions for the baby to recover. This can lead to fetal distress. Oxytocin to augment labour should not be used unless it is possible to monitor the rate and strength of contractions and the baby's heartbeat. Crucially there should be access to tocolytics (drugs to stop contractions) and to emergency Caesarean section.

Complications of obstructed labour

If obstructed labour is not treated the baby may be damaged or die. The woman may develop a fistula (vesico-vaginal or recto-vaginal) because the baby's head has been pressing on bladder, bowel and vaginal tissue. There is a risk of uterine rupture especially if the woman has a scar on the uterus from previous surgery. This can be fatal.

Prevention of obstructed labour

- Birth Plans encourage women and their families to consider such issues as transport to the most appropriate facility and the possibility of an elective section.
- Community health education about obstructed labour is essential in a country where most women still deliver at home. A book "Learning Together about Safe and Healthy Birth" has been produced in English and Kakwa to use in discussion with women's groups [2].
- 'Waiting homes' where women at high risk can

Figure 3: Woman and baby after an elective section in Yei Civil Hospital

live near the hospital until they deliver may reduce maternal mortality from obstructed labour. A systematic review of primary level referral systems for emergency maternity care in developing countries found that maternity waiting homes reduced the stillbirth rate but recommended further exploration through well conducted studies [3].

The new midwifery curriculum (which is with the government of South Sudan for approval) explains obstructed labour and how to teach it. Observing women in normal and abnormal labour is an essential part of learning midwifery skills although it is difficult for midwifery students to get this experience in a country where most women labour at home.

Summary

Antenatal care can pick out some women who are at risk of obstructed labour and a plan should be made for them to deliver in hospital. Careful monitoring in labour with appropriate use of abdominal and vaginal examinations can identify those who are not progressing. The partograph can give this valuable information in visual form. If the contractions are not regular and strong the safe use of oxytocin will increase the number of normal deliveries and therefore avoid some Caesarean sections.

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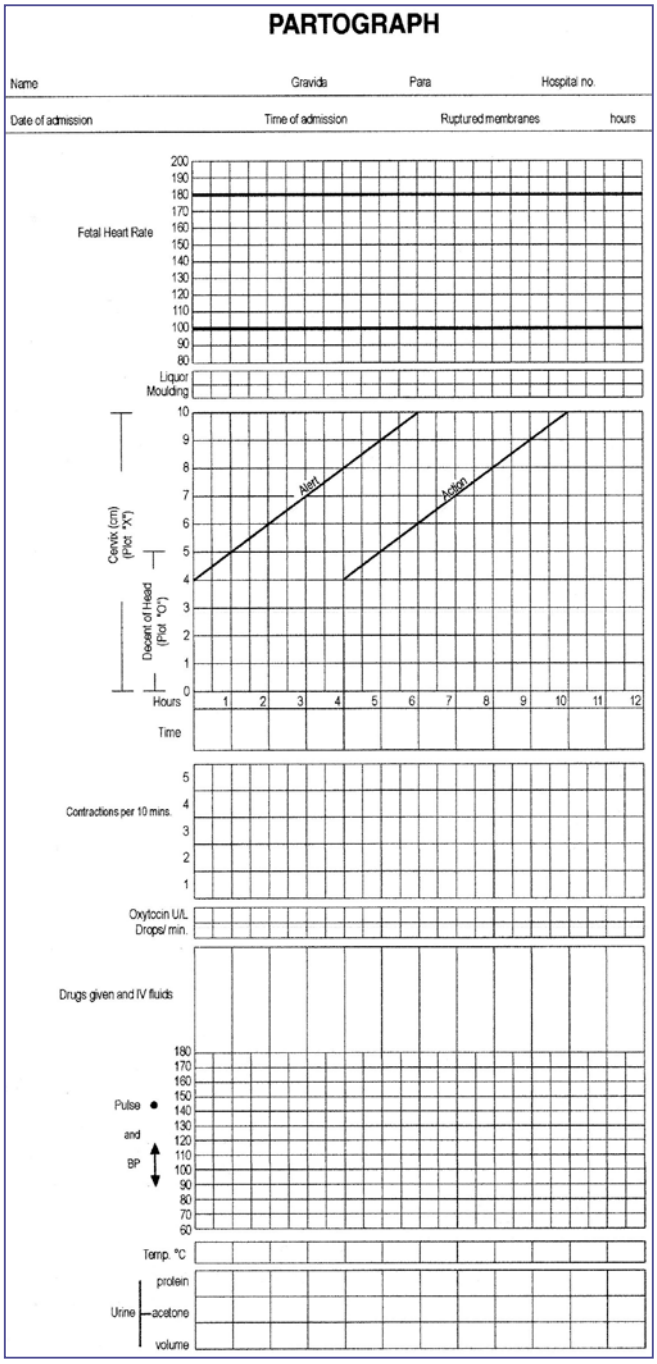

Figure 4. The partograph

Summary of practical tips that can inform practice

- Screen for risks for obstructed labour in antenatal care.
- Book elective Caesarean sections for those who cannot deliver normally.
- Encourage all women to consider how they would get to hospital if necessary.
- Educate the community about taking women into hospital if labour is longer than 12 hours.
- Use the partograph and refer women who do not progress.

Tuberculosis 2: Pathophysiology and microbiology of pulmonary tuberculosis

Robert L. Serafino Wani[a] MBBS, MRCP, MSc (Trop Med)

Pathophysiology

Inhalation of *Mycobacterium tuberculosis* leads to one of four possible outcomes:

- Immediate clearance of the organism
- Latent infection
- The onset of active disease (primary disease)
- Active disease many years later (reactivation disease).

Among individuals with latent infection, and no underlying medical problems, reactivation disease occurs in 5 to 10 percent of cases [1]. The risk of reactivation is markedly increased in patients with HIV [2]. These outcomes are determined by the interplay of factors attributable to both the organism and the host.

Primary disease

Among the approximately 10 per cent of infected individuals who develop active disease, about half will do so within the first two to three years and are described as developing rapidly progressive or primary disease.

The tubercle bacilli establish infection in the lungs after they are carried in droplets small enough (5 to 10 microns) to reach the alveolar spaces. If the defense system of the host fails to eliminate the infection, the bacilli proliferate inside alveolar macrophages and eventually kill the cells. The infected macrophages produce cytokines and chemokines that attract other phagocytic cells, including monocytes, other alveolar macrophages and neutrophils, which eventually form a nodular granulomatous structure called the tubercle. If the bacterial replication is not controlled, the tubercle enlarges and the bacilli enter local draining lymph nodes. This leads to lymphadenopathy, a characteristic clinical manifestation of primary tuberculosis (TB). The lesion produced by the expansion of the tubercle into the lung parenchyma and lymph node involvement is called the Ghon complex. Bacteremia may accompany initial infection.

The bacilli continue to proliferate until an effective cell-mediated immune (CMI) response develops, usually two to six weeks after infection. Failure by the host to mount an effective CMI response and tissue repair leads to progressive destruction of the lung. Tumour necrosis factor (TNF)-alpha, reactive oxygen and nitrogen intermediates and the contents of cytotoxic cells (granzymes, perforin) may all contribute to the development of caseating necrosis that characterize a tuberculous lesion.

Unchecked bacterial growth may lead to haematogenous spread of bacilli to produce disseminated TB. Disseminated disease with lesions resembling millet seeds is termed miliary TB. Bacilli can also spread by erosion of the caseating lesions into the lung airways -and the host becomes infectious to others. In the absence of treatment, death ensues in 80 per cent of cases [3]. The remaining patients develop chronic disease or recover. Chronic disease is characterized by repeated episodes of healing by fibrotic changes around the lesions and tissue breakdown. Complete spontaneous eradication of the bacilli is rare.

Reactivation disease

Reactivation TB results from proliferation of a previously dormant bacterium seeded at the time of the primary infection. Among individuals with latent infection and no underlying medical problems, reactivation disease occurs in 5 to 10 per cent [1]. Immunosuppression is associated with reactivation TB, although it is not clear what specific host factors maintain the infection in a latent state and what triggers the latent infection to become overt. See previous article [4] for immunosuppressive conditions associated with reactivation TB. The disease process in reactivation TB tends to be localized (in contrast to primary disease): there is little regional lymph node involvement and less caseation. The lesion typically occurs at the lung apices, and disseminated disease is unusual unless the host is severely immunosuppressed. It is generally believed that successfully contained latent TB confers protection against subsequent TB exposure [5]

Microbiology

M.tuberculosis (MTB) belongs to the genus Mycobacterium that includes more than 80 other species. Tuberculosis (TB) is defined as a disease caused by members of the M. tuberculosis complex, which includes the tubercle bacillus (M. tuberculosis), *M. bovis, M. africanum, M. microti, M. canetti, M. caprae* and *M. pinnipedi* [6].

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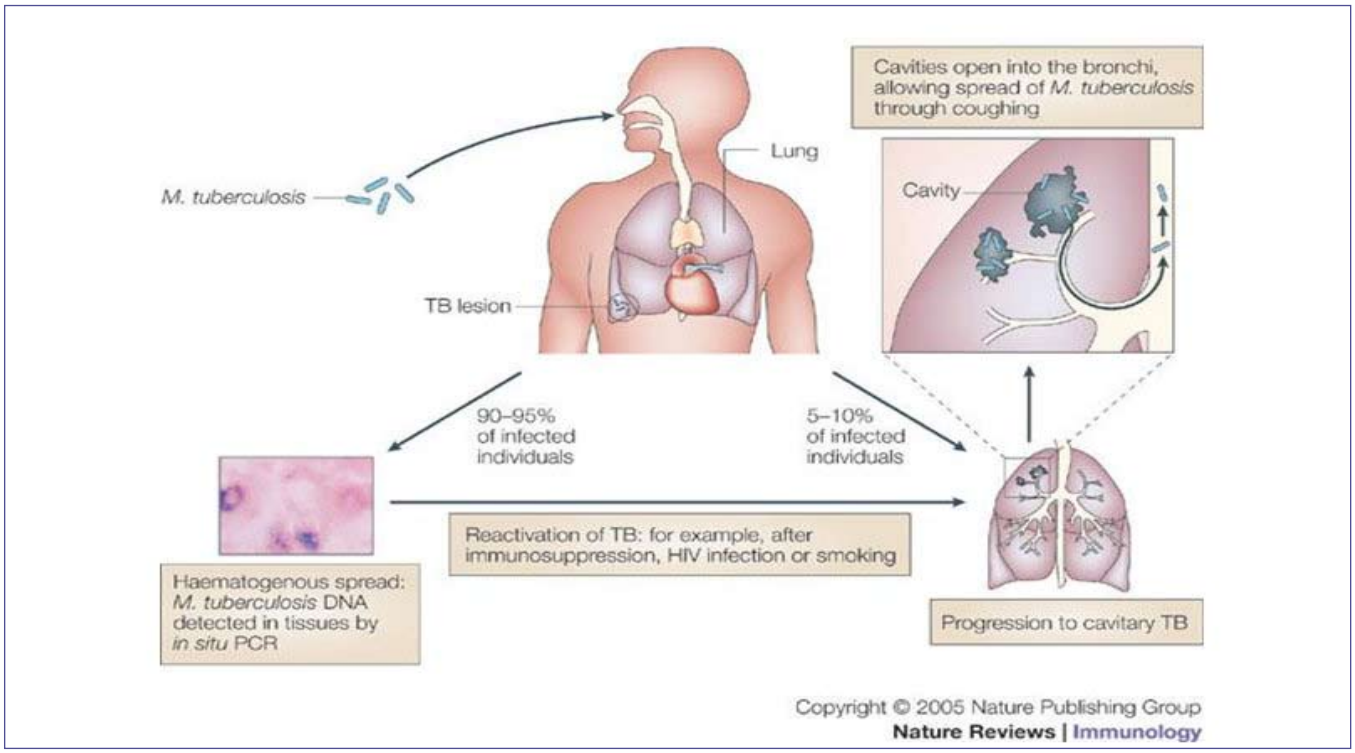

Figure 1. Pathophysiology of tuberculosis

Reproduced with permission from 'Immune responses to tuberculosis in developing countries: implications for new vaccines' by Graham A. W. Rook, Keertan Dheda, Alimuddin Zumla in Nature Reviews Immunology published by Nature Publishing Group Aug 1, 2005

Cell envelope: The mycobacterial cell envelope is composed of a core of three macromolecules covalently linked to each other (peptidoglycan, arabinogalactan, and mycolic acids) and a lipopolysaccharide, lipoarabinomannan (LAM), which is thought to be anchored to the plasma membrane [7].

Staining characteristics: The cell wall components give mycobacteria their characteristic staining properties. The organism stains positive with Gram's stain. The mycolic acid structure confers the ability to resist destaining by acid alcohol after being stained by certain aniline dyes, leading to the term acid fast bacillus (AFB). Microscopy to detect AFB (using Ziehl-Neelsen or Kinyoun stain) is the most commonly used procedure to diagnose TB; a specimen must contain at least 10 [5] colony forming units (CFU)/mL to yield a positive smear [8]. Microscopy of specimens stained with a fluorochrome dye (such as auramine O) provides an easier, more efficient and more sensitive alternative. However, microscopic detection of mycobacteria does not distinguish *M. tuberculosis* from non-tuberculous mycobacteria.

Growth characteristics: MTB are aerobes. Their reproduction is enhanced by the presence of 5-10% CO2 in the atmosphere. They are grown on culture media with high lipid content, e.g. Lowenstein-Jensen (LJ) medium. The generation time of TB is approximately 12-18 hours, so that cultures must be incubated for three to six weeks at 370C until proliferation becomes microscopically visible. [9] Broth-based culture systems to improve the speed and sensitivity of detection have been developed [10]. In AFB smear-positive specimens, the BACTEC system can detect *M. tuberculosis* in approximately eight days (compared to approximately 14 days for smear-negative specimens [11,12].

Drug sensitivity testing: Drug sensitivity testing is increasingly important with the emergence of increasingly more resistant *M. tuberculosis* isolates. In addition to the conventional methods to test *M. tuberculosis* drug sensitivity, methods that rely on automated systems and PCR-based tests have been developed [13,14]. The microscopic observation drug sensitivity (MODS) test is another liquid culture drug-sensitivity test based on observation of M. tuberculosis growth in liquid broth medium containing a test drug. In an evaluation of 3,760 sputa samples using MODS, automated MB/BacT system, and Löwenstein-Jensen culture, sensitivity was 98, 89, and 84 percent respectively and the median time to the test results was 7, 22, and 68 days respectively [15]. The Xpert MTB/RIF is an integrated system that combines sample preparation in a modular cartridge system and real-time PCR. In 2010

this technique was recommended by the WHO to be used in place of traditional smear microscopy for the diagnosis of drug-resistant TB or TB in HIV-infected patients [16]. This test has been shown to have a sensitivity of greater than 98 per cent in sputum smear-positive TB cases and 75 to 90 per cent in smear-negative TB cases. The sensitivity in the detection of rifampicin resistant MTB exceeded 97 per cent, while specificity ranged 98 to 100 per cent. The test can yield results in less than two hour [17-19]. Here rifampicin resistance is assessed as a surrogate for multidrug resistant MTB.

Conclusion

South Sudan faces huge challenges in controlling tuberculosis. This is partly due to a limited laboratory network and lack of a tuberculosis reference laboratory (author's observation).

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South Sudan Medical Journal thanks:

- All those who responded to our request for annotated photographs. We now have some excellent ones that we will be using In future issues of the journal. Please keep them coming!
- Everyone who reviewed articles in this journal – you know who you are.
- James Ayrton and Rob Flooks who upload the journal onto our website.

Poisoning with organophosphates

David Tibbutt[a] DM, FRCP

In a recent article in this journal [1] I discussed the question of poisoning in South Sudan in an attempt to generate information about the size of the problem. As I pointed out from my experience in Uganda I was concerned about the occurrence of, and mortality from, poisoning with organophosphates. Seventy-one cases of poisoning from organophosphates were reported from forty hospitals and health centres over a six months' period with a 27% mortality. No other agent was associated with a death in this series (Table 1).

Extrapolating these data to the whole country this could reflect 1,250 – 2,500 deaths per year. Worldwide there are thought to be around one million poisonings with a significant mortality. An estimate of mortality from self-poisoning from organophosphates in developing countries is around 200,000 each year [2]. Another study [3] from two hospitals in Kampala, Uganda, over a six months' period in 2005 reported 276 patients but, unlike my review, included patients poisoned with alcohol: 42.4% of patients were poisoned with "agrochemicals". The overall mortality was low at 1.4%.

Table 1. Reports of poisoning in Uganda over six months from 40 health units

Drugs / chemicals	Age up to 10 years		Age over 10 years	
	Number (%)	Deaths	Number (%)	Deaths (%)
Aspirin	1(3%)	0	2 (2%)	0
Batteries	2 (5%)	0	2 (2%)	0
Chloroquine	0	0	3 (3%)	0
Chlorpheniramine	0	0	1 (1%)	0
Diazepam	0	0	2 (2%)	0
Herbicide	0	0	1 (1%)	0
Kerosene	21 (55%)	0	1 (1%)	0
Organophosphate	8 (21%)	0	63 (66%)	19 (30%)
Paracetamol	4 (11%)	0	4 (4%)	0
Rat poison	1 (3%)	0	1 (1%)	0
Unknown	1 (3%)	0	15 (16%)	0
Totals	38	0	95	19 (20%)

What are organophosphates?

These compounds were first produced in the early 1800's by the reaction between alcohol and phosphoric acid. There are two main chemical groups. The phosphorothioates (P=S) which include malathion, parathion, chlorpyrifos, diazinon, disulfoton, phosmet, fenitrothion and the phosphates (P=O) which include dichlorvos and trichlorfon.

What is their toxic action?

They are easily absorbed through the gastro-intestinal and respiratory tracts and significantly through the skin. Their key action is to inhibit acetylcholinesterase which occurs especially in the nicotinic and muscarinic receptors of nerve, muscle, and brain grey matter. Acetylcholine then accumulates at neuromuscular junctions causing depolarization of skeletal muscle, resulting in weakness and fasciculations. In the central nervous system, neural transmission is disrupted. Reactivation ("recovery") of this enzyme occurs very slowly but can be speeded up by a cholinesterase-reactivating agent such as pralidoxime.

The time of onset of the toxicity and its duration vary enormously depending on the organophosphates implicated. The phosphorothioates are more lipophilic and more chemically stable than the phosphates and must be biotransformed (activated) to become biologically active. This means that the onset of features after exposure may be delayed and intoxication may be prolonged because of storage in fat. In contrast, phosphates are biologically active and therefore after exposure features may appear more quickly.

Recent research has indicated that the presence of solvents in commercial formulations may account for much of their toxicity [4]. By reducing the toxicity to mammals in these agricultural preparations may significantly reduce the deaths from suicidal attempts.

What are their clinical effects?

The patient may have been exposed at the time of agricultural spraying of crops in an enclosed space. Deliberate self-poisoning with an organophosphate is unusual in western countries but common in Africa.

The **acute effects** can appear within hours and depend on the way in which the person has been exposed:

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inhalation, skin, ingestion (swallowing) and eye contact.

Inhalation:

- Chest tightness and wheezing,
- Cough,
- Frothy sputum (bronchorrhoea) and pulmonary oedema,
- Systemic features.

Skin:

- Localized sweating,
- Muscle fasciculation,
- Systemic features.

Ingestion:

- Increased salivation,
- Nausea and vomiting,
- Diarrhoea (often watery),
- Cramping abdominal pains,
- Involuntary defaecation,
- Systemic features.

Eye:

- Constricted pupils (miosis),
- Pain,
- Lacrimation (excess tears),
- Blurred vision.

Systemic features may include:

- Increased sweating,
- Uncontrolled defaecation and urination,
- Anxiety, restlessness and confusion,
- Muscle weakness, cramps and fasciculation,
- Ataxia and tremor,
- Headache and dizziness,
- Epileptics fits,
- Cardiac and respiratory failure,
- Glycosuria and hyperglycaemia.

The **physical signs of acute poisoning** are as would be expected from excess acetylcholine action: pin-point pupils (constricted), marked sweating, muscle fasciculation and (especially proximal) muscle weakness. The neck flexor and eye (extra-ocular) muscles are particularly affected. If the respiratory muscles are involved leading to respiratory failure then prognosis is poor. Bradycardia or tachycardia, cardiac dysrhythmias and marked hypotension may also occur. However there are later consequences of organophosphate poisoning as follows:

- **Intermediate syndrome:** Relapse after apparent resolution of cholinergic symptoms has been reported in patients, particularly in those who have ingested highly lipophilic organophosphate insecticides, and is termed the "intermediate" syndrome. Paralysis of limb muscles, neck flexors and cranial nerves develops some 24-96 hours after exposure and probably represent the nicotinic effects of acetylcholine.
- **Delayed neuropathy:** organophosphate-induced delayed neuropathy can also result rarely from acute exposure to some organophosphate insecticides (e.g. chlorpyrifos, dichlorvos, isofenphos, metamidophos, trichlorfon). This delayed neuropathy is initiated by phosphorylation and subsequent aging of at least 70% of neuropathy target esterase in peripheral nerves and occurs within hours of poisoning. The features are characterised by distal degeneration of some axons of both the peripheral and central nervous systems occurring 1-4 weeks after single or short-term exposures. Cramping muscle pain in the lower limbs, distal numbness and paraesthesiae occur, followed by progressive weakness, depression of deep tendon reflexes in the lower limbs and, in severe cases, in the upper limbs. Signs include high-stepping gait associated with bilateral foot drop and, in severe cases, quadriplegia with foot and wrist drop as well as pyramidal signs. In time, there might be significant recovery of the peripheral nerve function but, depending on the degree of pyramidal involvement, spastic ataxia may be a permanent outcome.

Diagnosis

This is usually obvious from the history (often obtained from attendants), symptoms and physical signs. It can be confirmed by measuring plasma or red blood cell acetylcholinesterase levels but such tests are highly unlikely to be available. Even if they were available treatment must not await the results.

The differential diagnosis of the long-term neurological features must include:

- Guillain-Barré syndrome (acute inflammatory polyneuropathy),
- Diabetic neuropathies,
- HIV-related neuropathies,
- Myasthenia gravis,
- Neuropathies caused by other toxic chemicals.

Management

It is essential to protect of all members of the medical team from contact with any organophosphate on the patient's clothing and from vomitus. Surgical gloves should be worn. After starting the stabilization and treatment the patient should be decontaminated by removing and

carefully disposing of all clothing and then washing the patient with soap and water.

As with all patients at mortal risk resuscitation and stabilisation are priorities and the **"ABC"** should always be remembered: **A**irway, **B**reathing (ventilation) and **C**irculation. A note of the Glasgow Coma Score is a useful baseline from which to monitor subsequent progress.

Oxygen should be given and intravenous (IV) access established. IV fluids should be administered according to observations with special attention to the risk of the development of pulmonary oedema. If the latter occurs then the careful use of IV furosamide may help.

There is little evidence that gastric lavage will improve outcomes. Indeed it may even worsen the outcome especially if the airway is not adequately protected. If the procedure is used it should only be carried out if the toxic agent has been taken up to an hour before [5,6].

In the past activated charcoal has been given by mouth in an attempt to reduce absorption of a toxic agent [7,8]. There appears to be little evidence of benefit in organophosphate poisoning. It can be messy to administer and if the patient is vomiting and perhaps has respiratory depression then there are added dangers to the airway.

In adults the routine use of diazepam 5 – 10mg IV reduces anxiety and suppresses fits. It is important to note that phenothiazines (e.g chlorpromazine) **should not** be used for sedation as they have an anticholinesterase effect and so would make the situation worse. **A careful watch of respiratory function is essential when any form of sedation is given.**

Atropine will block the muscurinic effects of acetylcholine. For an adult the dose is 1 – 3 mg IV and then repeated by doubling the dose every five minutes until there are signs of a beneficial response. This is noted by the clearance of bronchorrhoea and bronchospasm and the pulse rising above 80 / minute and systolic blood pressure above 80mmHg. Subsequent administration should be sufficient to maintain stability as noted by these observations. Some patients are resistant to the effects of atropine and need large doses possibly up to 100mg in 24 hours. Too much atropine (atropine intoxication) is indicated by a tachycardia, dry mouth and skin and an abdominal ileus. **For a child** the initial dose of atropine is 0.02 mg / kg. Atropinisation should be maintained for 48 hours.

The use of an **oxime** (e.g. **pralidoxime chloride**) has been suggested as beneficial if the patient is treated at an early stage after taking the organophosphate. They work by reactivating cholinesterase. The loading dose is 30 mg / kg given by IV injection **over 30 minutes.** If benefit follows, as reflected by improved muscle power and less fasciculation and convulsions and improved conscious level, then an infusion should be provided at 8 – 10 mg/kg/hour and maintained until atropine has not been needed for up to 24 hours. **The use of an oxime should never replace the administration of atropine.** In my experience a supply of an oxime has not been available where I have worked. **However** a recent review [9] of the literature does not support this "standard" recommendation as beneficial, although it is possible that certain subgroups of patients might benefit. Further research is needed to establish the best doses and for whom.

It is essential that all patients poisoned with an organophosphate are constantly and regularly monitored by the nursing and medical staff:

1. Hourly pulse, blood pressure and respiratory rate charts.
2. Fluid balance charts.
3. Glasgow Coma Scale chart.
4. A baseline electrocardiogram recording could prove valuable later as may an initial assessment of blood urea, creatinine and electrolytes although it is appreciated that facilities are often not available.
5. Any deterioration in respiratory function should be taken as an indication for possible artificial ventilation.

Post-recovery management

When a patient recovers from a self-poisoning event it is not the end of the medical team's responsibility. An assessment of the patient's psychosocial state is necessary to indicate an underlying psychiatric disorder and the risk of repetition [10]. A sympathetic and non-judgmental approach must always be adopted.

Practice points

- Self-poisoning with organophosphates is common in developing countries with a high mortality.
- Rapid initial assessment, resuscitation, stabilisation and administration of atropine is crucial.
- The value of oximes remains uncertain.
- Close and careful monitoring of the patient will alert the medical team to life-saving intervention.
- The mortality can be reduced.
- Post-recovery assessment and care are essential.

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Acknowledgment

The author is most grateful to Professor Allister Vale (Director, National Poisons Information Service (Birmingham Unit) and West Midlands Poisons Unit, City Hospital, Birmingham, UK.) for his valuable comments during the writing of this review.

A QUIZ FOR OUR READERS

A woman aged 25 years was admitted because of a post-delivery problem following a prolonged labour. This picture was taken at the time of the investigation:

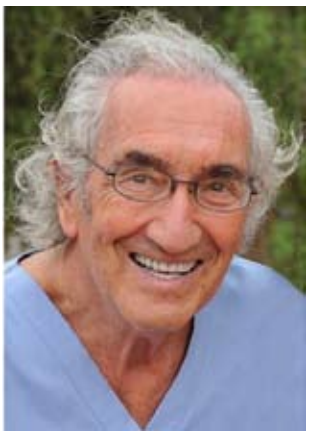
(Photo credit: Brian Hancock)

1. What is the diagnosis?
2. What is the significance of the purple dye (arrowed) appearing in the perineum?
3. What is the most likely cause of the problem?
4. What is the treatment?
5. What is the social consequence before and after successful management?

Answers on page 23

Appreciation of Prof. Meo

SSMJ is saddened to hear of the recent death of Professor Giuseppe Meo of the Italian NGO Comitato Collaborazione Medica (CCM). Professor Meo was a surgeon who visited and worked over many years in remote rural areas of South Sudan starting in Wau in 1983 up until last year. SSMJ recently published a paper by Professor Meo and his colleagues and we plan to publish his last one in a forthcoming issue. Professor Meo will be greatly missed by the many health professionals to whom he was a kind mentor and teacher, and by his patients.



Intermittent Preventive Treatment of malaria in pregnancy using Sulfadoxine-Pyrimethamine (IPTp-SP): Updated WHO Policy Recommendation (October 2012)

World Health Organization and Global Malaria Programme

During the last few years, WHO has observed a slowing of efforts to scale-up intermittent preventive treatment of pregnant women (IPTp) for malaria with Sulfadoxine-Pyrimethamine (SP) in a number of countries in Africa. While there are several reasons for this, confusion among health workers about SP administration for IPTp may also be playing a role. For this reason, WHO is clarifying its recommendations, and urging national health authorities to disseminate these recommendations widely and ensure their correct application.

In several countries in Africa, some *Plasmodium falciparum* parasites carry quintuple mutations linked to SP resistance which are associated with in vivo therapeutic failure to SP. IPTp with SP remains effective in preventing the adverse consequences of malaria on maternal and fetal outcomes in areas where a high proportion of *Plasmodium falciparum* parasites carry these quintuple mutations . Therefore, IPTp with SP should still be administered to women in such areas.

All possible efforts should be made to increase access to IPTp with SP in all areas with moderate-to-high transmission in Africa, as part of antenatal care services. Based on a recent WHO evidence review, the following updated recommendations are provided:

- In areas of moderate-to-high malaria transmission, IPTp with SP is recommended for all pregnant women **at each scheduled antenatal care visit**. WHO recommends a schedule of four antenatal care visits.
  - The first IPTp-SP dose should be administered as early as possible during the 2nd trimester of gestation
  - Each SP dose should be given at least 1 month apart
  - The last dose of IPTp with SP can be administered up to the time of delivery, without safety concerns- IPTp should ideally be administered as directly observed therapy (DOT)
  - SP can be given either on an empty stomach or with food
  - Folic acid at a daily dose equal or above 5 mg should not be given together with SP as this counteracts its efficacy as an antimalarial
  - SP should not be administered to women receiving co-trimoxazole prophylaxis
- In some countries where IPTp with SP is currently being implemented, transmission of malaria has been reduced substantially. In the absence of information on the level of malaria transmission below which IPTp-SP is no longer cost-effective, such countries should not stop IPTp .
- There is currently insufficient evidence to support a general recommendation for the use of IPTp-SP outside Africa.
- Monitoring of IPTp-SP effectiveness and safety of multiple doses is essential and should continue. Research is ongoing to define the best methodology for such monitoring; this will be shared when available.

[reproduced with permission from WHO ID: 108251]

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1. The findings of an observational study in Tanzanian women in an area with high levels of quintuple mutation strongly associated with drug resistance and where the parasite dhps resistance mutation of codon 581 was also present showed increased placental parasite density and inflammatory changes in women reporting IPTp with SP use. This needs further investigation although it is important to note that this specific dhps resistance mutation is currently not common.
2. Report available on the WHO-GMP website at the following URL: http://www.who.int/malaria/mpac/sep2012/iptp_sp_erg_meeting_report_july2012.pdf
3. IPTp administration should be avoided during the 1st trimester of gestation but should start as soon as possible in the 2nd trimester. The fact that a woman has entered the second trimester can be determined by the onset of quickening or by measurement of fundal height by ANC health personnel.
4. WHO recommends daily iron and folic acid supplementation in pregnant women at the dose of 30-60 mg of elemental iron and 0.4 mg of folic acid, to reduce the risk of low birth weight infants, maternal anaemia and iron deficiency at term.
5. Cost-effectiveness modelling studies are on-going to address this question. Risk-benefit of SP administration needs also to be taken into account when considering recommendations on IPTp implementation.

Suspected clinical-radiological discord

Martin Tombe[a] M. Med (Medicine)

Abstract

17-year male student presented with vague constitutional symptoms and jaundice. His clinical chest findings initially suggested a discord with radiological findings. It turned out that the patient had a rare congenital disorder in addition to a seemingly common condition that brought him to the hospital.

The purpose of this case presentation is to share some challenges of a clinical-radiological discord in a teaching hospital in Zimbabwe. It shows a flow of teamwork from House Officers to the Consultants as well as radiological back up.

Case presentation

A seventeen-year old male student was seen in 2004 by a House Officer in Mpilo Central Hospital, a Teaching Hospital in Zimbabwe. He had complained of malaise, loss of appetite and epigastric discomfort for two weeks. He did not take alcoholic drinks. Systematic enquiry was unremarkable. On examination he looked generally well. His body temperature was 36.8^0 C. The pulse was 80 beats per minute and regular. His blood pressure was 110/70 mmHg and he was jaundiced with no pallor or lymphadenopathy. There was dullness to percussion and absent breath sounds over the left lower chest posteriorly and laterally. Examination of the other body systems was reported to be normal. There was no tenderness, masses or free fluid elicited in the abdomen.

Diagnoses and investigations

The clinical diagnoses were viral hepatitis and left pleural effusion.

- The full blood counts (FBC) and erythrocyte sedimentation rate (ESR) were within normal limits; thus WBC 4.2/μL, Hb 12.5g/dL and platelet 220/μL while ESR was 14 mm 1st hour of Westergren.
- The liver function tests were hepatitic in nature; thus alkaline phosphatase was 130 IU/L, alanine aminotransferase (ALT) 120 IU/L, aspartate aminotranferace (AST) 80 IU/L. Total bilirubin 90μmol/L and direct bilirubin 68μmol/L.
- The chest X-ray was reported as normal (Figure 1).

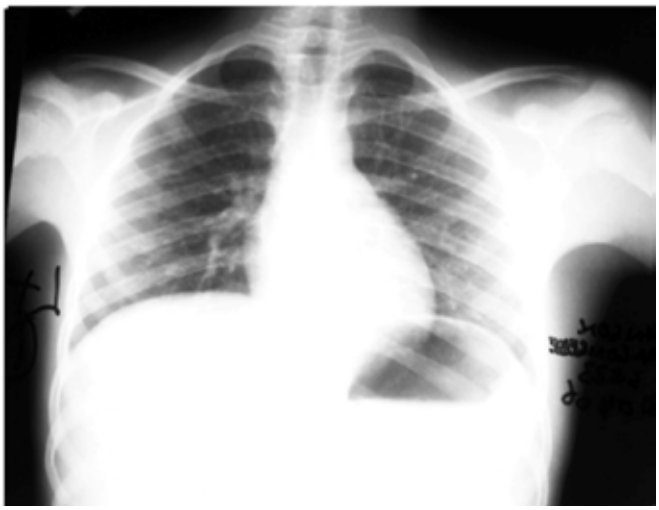

Figure 1. A postero-anterior chest X-ray showing no left pleural effusion

Consultant's review

The following morning the patient was reviewed by the Consultant who agreed with the possible diagnosis of viral hepatitis as one of the working diagnoses but which did not require in-patient care. Nevertheless an haemolytic process must also be considered. He commented that the therapeutic dose of paracetamol as prescribed was not contraindicated in liver diseases if given for a short time. He agreed with the clinical chest findings. He was surprised that there was no left pleural effusion on the chest X-ray. One possibility he considered was that the X-ray belonged to another patient. Before deciding on a repeat chest X-ray he re-examined the patient. He concluded that the chest X-ray definitely belonged to the patient, it was abnormal and he discharged the patient to be followed up as an out-patient.

The signs he had found were a cardiac apex beat on the right side and an area suggestive of hepatic dullness on the left side of the chest. The chest X-ray showed that the heart shadow and stomach gas bubble were on the right. The left hemi-diaphragm was higher than the right consistent with a left sided liver as shown in the edited chest X-ray (Figure 2).

On a closer observation and properly oriented the same chest X-ray (Figure 1) showed that it had been correctly but not clearly labelled (Figure 3).

Final diagnosis

The final diagnosis was dextrocardia with situs inversus. Hence there was a clinical-radiological concordance rather

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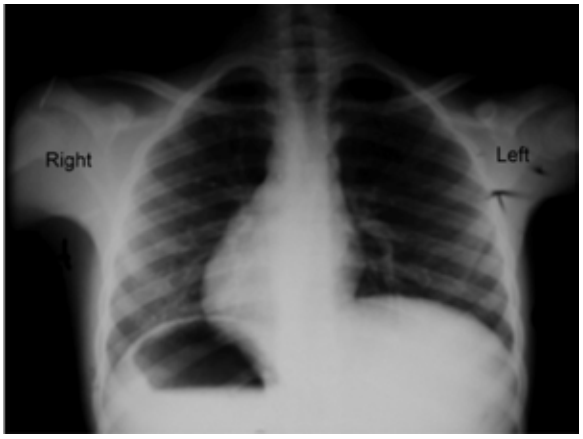

Figure 2. The edited postero-anterior chest X-ray properly oriented

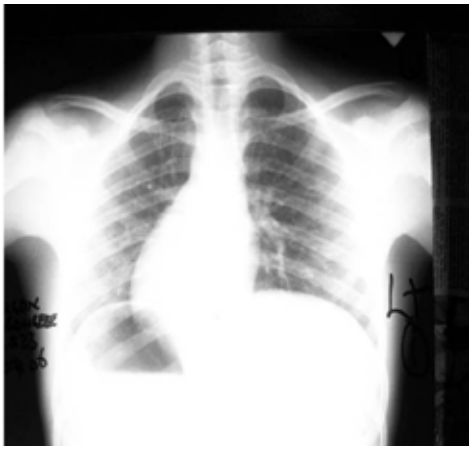

Figure 3. A properly oriented chest X-ray in figure 1 showing dextrocardia and situs inversus.

than discord. After two weeks the jaundice had cleared and the hepatitis screen was positive for hepatitis A.

Discussion

It is not uncommon to miss rare conditions on first examination. That is why even the consultant had suggested the X-ray may not belong to the patient until he did a physical examination. The need to label X-rays properly to avoid such errors cannot be overemphasized [1]. The indication for a further physical assessment arose from the absence of other supportive symptoms and signs for a pleural effusion and a chest X-ray that did not fit the physical signs.

Situs inversus with dextrocardia describes mal-rotation of the gut with the organs reversed from their abdominal normal positions. Without further investigations it cannot be stated with certainty if the case described had complete situs inversus and other cardiac congenital abnormalities such as ventricular septal defect. It is inherited as autosomal recessive and is believed to affect 1 in 12,000 people [2]. It may be associated with immotile cilia syndrome. This may affect the cilia of bronchi and paranasal sinuses leading to bronchiectesis and chronic paranasal sinusitis as in Kartegener's syndrome[1].

Males may have immotile spermatozoa and hence be infertile. There are other clinical disorders associated with dextrocardia [3] but they are beyond the scope and purpose of this article. There were no signs to suggest Kartegener's syndrome in this patient.

Learning points

1. Attention to the basic physical signs in all systems is essential during the initial examination: in this case the identification of the cardiac apex beat. This patient did not appear to have any reasons such as pulmonary emphysema to explain why the apex beat could not be felt on the left side.
2. Careful labelling of any X-ray in terms of its orientation.
3. The patient, on discharge, should be informed of the diagnosis of dextrocardia with situs inversus. This could have implications for future diagnostic problems such as acute appendicitis as his appendix is likely to be in the left iliac fossa, his spleen is probably on the right hypochondrion.

Conflict of interest: None.

References

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2. Kartagener M. Zur pathogenese der bronchiectasien. I Mitteilung:bronchiectasien bei situs viscerum inversus. *Betr Klin Tuberk*. 1933; 83: 498-501
3. Bohun CM, Potts JE, Casey BM, Sandor GG. A population-based study of cardiac malformations and outcomes associated with dextrocardia. *Am. J. Cardiol.* 2007; 100 (2): 305–309.

1 Manes Kartagene described the syndrome in 1933

The Juba Link e-mail Newsletter #8 (January 2013) has just been published. To join the mailing list write to Zorina Walsh at twalsh721@btinternet.com. Or visit the new Juba Link website at www.jubalink.org.uk where there are details of the link between St Mary's Hospital, Isle of Wight, UK and Juba Teaching Hospital, South Sudan.

Training the Trainers Course on Postgraduate Medical Education

Prepared by Tim Walsh and previously published in the Juba Link Newsletter, January 2013 http://www.jubalink.org.uk

A three-day Training the Trainers Course (19th-21st November 2012) was organised in conjunction with the Ministry of Health (RoSS) and Dr Oromo, Consultant Pathologist in Juba and the Wessex Consortium as a starter towards the Basic Medical Training Programme. Tim Walsh led the team with Dr Rich Bregazzi, an Educationalist and Dr David Attwood, a Medical Registrar. There were 18 participants, who were Consultants in various specialties at Juba Teaching Hospital

The objective was to provide the training that trainers would need to develop and deliver structured and validated postgraduate medical education in RoSS.

The programme was opened by the Minister of Health, Dr Michael Milli Hussein, the Undersecretary for Health, Dr Makur Kariom and the WHO Representative in Juba.

The first 21/2 days of the course covered areas such as educational roles and supervision, qualities of good trainers, workplace based learning, teaching techniques in different settings, appraisal and assessment and responding to underperformance but modified for the needs of trainers in South Sudan.

The last afternoon was devoted to a plenary session on the practicalities of setting up Postgraduate Medical Education and Training for doctors in South Sudan. It was agreed that the local Consultants, supported by the Consortium and Juba Link, would develop a 2-year programme for newly qualified doctors aimed at providing the training necessary to enable them to work effectively at the District level, including providing supervision to the Medical Assistants. Much of the preliminary work has been done and this programme is planned to start in March/April 2013.

In our view the Basic Medical Training Programme is a very important starting point. There is also a need to address the training needs of Medical Officers who have gone beyond the basic programme and in the longer term there will be the issue of specialist training. There was also a very strong desire for the development of a College of Physicians and Surgeons to have an over-arching role in the development of postgraduate medical education.

Overall, the course and the visit were extremely successful and generated much enthusiasm. We also had meetings with the University of Juba Medical School and the Minister of Health and there is very strong support locally at all levels for this initiative.

All photos by David Attwood

Resources

These are listed under:

- General issues.
- Child health and Nutrition.
- HIV and other infections.

General

A manifesto for the world we want

The Lancet at the end of 2012 listed five priority areas for the future. These are:

1. Women, who remain the dominant face of poverty – extending their reproductive rights and providing quality reproductive health care and safe abortion services, improving their education.

2. Early child development. Work on social determinants of health shows that focusing on the early years is critical to solving the problem of health inequalities in adulthood.

3. Adolescent health. Young people are the future for every society, and huge benefits to their health and development can be won through better education and preventive public health measures.

4. People living with non-communicable diseases (NCDs). NCDs are the leading cause of death and disability and have a huge socio-economic impact and this situation is predicted to worsen substantially by 2020 and beyond. Managing and treating cardiovascular disease, cancer, diabetes, and chronic respiratory disease will need continued action, as will mental health and neurological conditions such as epilepsy and dementia, which still get marginalised in global policy debates.

5. Ageing population. By 2016, there will be more people older than 65 years than children younger than 5 years. Provision of age-appropriate health-care services, long term care and support, and the creation of sustainable cities will be key to enable older people to participate in society fully.

Ref: The Lancet, Volume 380, Issue 9857, Page 1881, 1 December 2012

The Global Burden of Disease Study 2010 (GBD 2010)

GBD 2010 is the largest ever systematic effort to describe the global distribution and causes of a wide array of major diseases, injuries, and health risk factors. The results show that infectious diseases, maternal and child illness, and malnutrition now cause fewer deaths and less illness than they did twenty years ago. As a result, fewer children are dying every year, but more young and middle-aged adults are dying and suffering from disease and injury, as non-communicable diseases, such as cancer and heart disease, become the dominant causes of death and disability worldwide. Since 1970, men and women worldwide have gained slightly more than ten years of life expectancy overall, but they spend more years living with injury and illness.

GBD 2010 consists of seven Articles, each containing a wealth of data on different aspects of the study (including data for different countries and world regions, men and women, and different age groups), while accompanying Comments include reactions to the study's publication from WHO's Director-General and World Bank's President .

See http://www.thelancet.com/themed/global-burden-of-disease?elsca1=GBD-TL&elsca2=email&elsca3=JCKOR5F

Note you can register with the Lancet to see the full text of these articles and many others by going to http://www.thelancet.com/user/register

Atlas of African Health Statistics 2012.

See http://www.aho.afro.who.int/en/publication/63/atlas-african-health-statistics-2012-health-situation-analysis-african-region

[from HIFA2015]

Child health and nutrition

Safe Pregnancy and Childbirth mobile application for iPhone

http://hesperian.org/books-and-resources/safe-pregnancy-and-birth-mobile-app

This app covers prenatal health, danger signs during pregnancy and birth, and 20 how-to skills for health workers

Presents life-saving information in a clear, accessible style. Intuitive navigation designed for anyone to easily find the information they are looking for. Once downloaded onto an iPhone, the information can be accessed from the most remote communities, with no Internet connection required.

RESOURCES

Now available for free download in the iTunes Apple Store. http://itunes.apple.com/us/app/safe-pregnancy-and-birth/id496919735?mt=8

International Policy on HIV and Breastfeeding

This resource aims to clarify the confusion due to changing HIV and infant feeding guidance and is intended for policy-makers, breastfeeding advocates, national breastfeeding committees, public health advocates, women's health activists and others working in the community. It summarises up-to-date scientific evidence as at the end of 2012. Research emerging between WHO's 2006 and 2010 guidance documents showed conclusively that maternal/infant ARV regimens during pregnancy and breastfeeding greatly reduce vertical transmission of HIV; and that exclusive and continued breastfeeding significantly improves overall HIV-free survival.

Ref: WABA - International Policy on HIV and Breastfeeding: a Comprehensive Resource. December 2012,

http://www.waba.org.my/whatwedo/hcp/ihiv.htm#kit

[from ProNut-HIV forum]

Malnutrition eLearning

Malnutrition eLearning course is a free course to help training doctors, nurses and nutritionists in management and treatment of severe malnutrition. It is hosted by the University of Southampton, UK and is supported by the International Malnutrition Task Force. Already 850 people around the world have signed. Find details of the course at www.som.soton.ac.uk/learn/test/nutrition.

1,000 Days Nutrition Newsroom

The Nutrition Newsroom at news.thousanddays.org is designed to bring you the latest nutrition-related news from around the web and world, particularly related to the first 1,000 days of life, all in one place. In recent years, the importance of nutrition has garnered increased attention, growing from coverage by global development news and opinion outlets to making the headlines of major news outlets worldwide. The aim of this new tool is to help to showcase the importance nutrition plays not only in people's lives, but also in the healthy growth of nations and economies. Send comments and feedback to info@thousanddays.org.

Guidelines on basic newborn resuscitation (2012)

http://www.who.int/maternal_child_adolescent/documents/basic_newborn_resuscitation/en/index.html

Globally, about one quarter of all neonatal deaths are caused by birth asphyxia (defined simply as the failure to initiate and sustain breathing at birth). Effective resuscitation at birth can prevent a large proportion of these deaths. The need for clinical guidelines on basic newborn resuscitation, suitable for settings with limited resources, is universally recognized. The objective of these updated WHO guidelines is to ensure that newborns in resource-limited settings who require resuscitation are effectively resuscitated. These guidelines will assist programme managers responsible for implementing maternal and child health programmes to develop or adapt national or local guidelines, standards and training materials on newborn care

CMAM Toolkit: Rapid start-up resources for emergency nutrition personnel

https://sites.google.com/site/stcehn/documents/cmam-toolkit

The CMAM (Community-based Management of Acute Malnutrition) Toolkit is a collection of tools for program managers to begin implementation of CMAM programs, either at the onset of a crisis or during a protracted crisis, as a new emergency nutrition activity. The toolkit is an easy-to-use well-illustrated compilation of existing tools and resources that allow managers to rapidly access needed inputs and begin implementation as soon as possible, without needing to spend a lot of time searching for certain tools.

The toolkit is not meant to be used as a replacement of national protocols. When starting up any emergency nutrition program, the first resource for program managers is the Ministry of Health.

See also the Home Page of Save the Children's Emergency Health and Nutrition site at https://sites.google.com/site/stcehn/home

The International Child Health Group Summer 2012 newsletter is now available on the ICHG website at http://www.ichg.org.uk/publications/ICHG%20newsletter%20summer%202012.pdf

Effect of nutritional supplementation of breastfeeding HIV positive mothers on maternal and child health

It is well established that breastfeeding is beneficial for child health, however there is debate regarding the effect of lactation on maternal health in the presence of HIV infection and the need for nutritional supplementation in HIV positive lactating mothers. This randomized controlled clinical trial studied the impact of nutritional supplementation on breastfeeding mothers. Measurements included anthropometry; body composition indicators;

CD4 count, haemoglobin and albumin; as well as incidence rates of opportunistic infections; depression and quality of life scores. Infant measurements included anthropometry, development and rates of infections. The supplement made no significant impact on any maternal or infant outcomes. However in the small group of mothers with low BMI, the intake of supplement was significantly associated with preventing loss of lean body mass. There was no significant impact of supplementation on the infants.

See http://www.biomedcentral.com/1471-2458/11/946

Ref: Effect of nutritional supplementation of breastfeeding HIV positive mothers on maternal and child health: findings from a randomized controlled clinical trial. G. Kindra, A. Coutsoudis and F. Esposito, BMC Public Health 2011, 11:946 doi:10.1186/1471-2458-11-946

HIV and infection

Association of BMI change with TB treatment mortality in HIV-positive smear-negative and extrapulmonary TB patients

The objective of this study was to assess the association of BMI change at 1 month from TB treatment start with mortality among HIV-positive individuals with smear-negative and extrapulmonary TB. A retrospective cohort study of 1090 adult HIV-positive new TB patients in Médecins Sans Frontières treatment programmes in Myanmar and Zimbabwe was conducted. A strong association was found between BMI category change during the first month of TB treatment and mortality. BMI category change could be used to identify individuals most at risk of mortality during TB treatment among smear-negative and extrapulmonary patients.

See http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3335812/AbstractOBJECTIVE

[From ProNut-HIV forum]

Improving the treatment of pneumonia, diarrhoea and malaria among children

Comprehensive evidence has been published that shows how using community health workers to diagnose and treat the three most common killers of African children – pneumonia, diarrhoea and malaria – can increase access and reduce deaths. Millions of children live at the edge of health systems, with little or no ability to reach a health facility when they become sick, but a special supplement of 16 new research articles provides a rich source of information on how families can get care for their children right in their own communities. See TDR news item 12 November 2012 at http://www.who.int/tdr/news/2012/improving_treatment/en/index.html

TDR, the Special Programme for Research and Training in Tropical Diseases, is a global programme of scientific collaboration that helps coordinate, support and influence global efforts to combat a portfolio of major diseases of the poor and disadvantaged. TDR is run by the WHO, and sponsored by UNICEF, UNDP) and the World Bank. Siign up to receive TDR enews by going to http://www.who.int/tdr/news/tdrmedia_listserv/en/index.html

Prevalence of HIV and chronic co-morbidities among older adults

Limited evidence is available on HIV, aging and co-morbidities in sub-Saharan Africa. This article describes the prevalence of HIV and chronic co-morbidities among those aged 50 years and older in South Africa (2007-2009) using nationally representative data. HIV prevalence among adults aged 50 and older in South Africa was 6.4% and was particularly elevated among Africans, women aged 50-59 and those living in rural areas. Rates of chronic disease were higher among all older adults compared with those aged 18-49. Of those aged 50 years and older, 29.6% had two or more of the seven chronic conditions compared with 8.8% of those aged 18-49 years. When controlling for age and sex among those aged 50 and older, BMI was lower among HIV-infected older adults aged 50 and older (27.5 kg/m2) than in HIV-uninfected individuals of the same age (30.6). Grip strength among HIV-infected older adults was significantly weaker than among similarly-aged HIV-uninfected individuals.

Ref: AIDS 2012 Jul 31;26 Suppl 1:S55-63.d.

Answers to Quiz on page 16

1. Vesico-vaginal fistula.
2. Dye has been instilled into the bladder through the urethral catheter and then leaks out into the vagina to confirm a vesico-vaginal fistula.
3. Prolonged obstructed labour leading to tissue necrosis between the vagina and bladder and the formation of the fistula. Urine then leaks into the vagina and the patient has no control.
4. Surgical repair.
5. Rejection by society because of the unpleasant smell that accompanies constant leakage of urine. With successful repair this problem is resolved.

Zorina Walsh, Nancy MacKeith and David Tibbutt compiled this quiz. We thank Brian Hancock, MD, FRCS, FRCOG (Hon.), Visiting Fistula Surgeon to Uganda for the photograph.

Examples of checklists for community-based frontline health workers in South Sudan

Here are two of nine checklists from the Maternal, Newborn, and Child Survival (MNCS) Initiative, which was developed and is being implemented countrywide by Massachusetts General Hospital and the Ministry of Health. These two checklists illustrate the basic steps community-based providers can use to diagnose and manage the danger signs of labour, and heavy bleeding. For more information, please contact: Dr Thomas Burke, *tfburke@partners.org*.