Maternal mortality and near-misses at Busia District Hospital in Kenya

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Abstract

OBJECTIVE To examine causes of maternal mortality, at Busia District Hospital (BDH) in Kenya, in women who develop serious complications in pregnancy and during delivery. We want to investigate the handling of these complications by the health staff at BDH.

METHODS AND MATERIALS This is a case study. Data was collected at BDH Kenya in the period of February 7th to March 11th 2011. The study population consists of cases of mothers that either died or were near-misses. Case stories were collected through information from our observations, staff interviews, patient files, antenatal Health Care (ANC) book notes and interviews of the patients and their relatives. Staff reflections on birth complications were collected through interviews.

RESULTS 8 women died or were near-misses. The major causes for these outcomes were infections, haemorrhage and hypertensive disorders.

CONCLUSION Lack of facilities and inadequate opportunity for treatment, poor priority, lack of proper organisation, delays in treatment and diagnosing as well as inadequate training of staff were main reasons for complications to develop.

PERSPECTIVES To reduce maternal mortality and near-misses cases in BDH we suggest the following easy strategies to be implemented:

A. Introduce routines or improve existing so medicine boxes are updated daily. This ensures that boxes are filled and medicine is not expired.

B. Introduce guidelines in out patient department (OPD) making sure that blood for grouping and cross matching (GXM) are taken and at least one intravenous (IV) line is secured of all critically ill patients. Especially where the doctors suspect haemorrhage.

C. Attach one nurse to critically ill patients in the ward making her responsible for monitoring the patient.

Summary (in Danish)

FORMÅL At undersøge årsager til mødredødelighed på Busia Distrikt Hospital i Kenya, hos kvinder der udvikler alvorlige komplikationer i graviditet og under fødsel. Vi ønsker at undersøge sundhedspersonalets håndtering af disse komplikationer på BDH.


RESULTATER 8 kvinder døde eller var nær ved. Hovedårsagerne for disse udfald var infektioner, blødning og hypertensive lidelser.

KONKLUSION Manglende faciliteter og behandlingsmuligheder, ringe prioritering, dårlig organisering, mangel på effektiv organisering, forsinkelser i behandling og diagnostik samt mangelfuld uddannelse af personale var hovedårsager til at komplikationer opstod.

PERSPEKTIVERING For at reducere mødredødelighed og ”near-misse” cases på BDH forslår vi at implementere følgende nemme strategier:

A. Introducere rutiner eller forbedrer eksisterende så medicinæsker er opdateret dagligt. Dette sikrer at æskerne er fyldte og at medicinen ikke er udløbet.

B. Introducere retningsslinjer i OPD, og hermed sikre at blod til type og forlig tages og at mindst en IV adgang sikres hos alle kritisk syge patienter. Især dem hvor lægen mistænker blødning.

C. Tilknyt en sygeplejerske til kritisk syge patienter i afdelingen og gøre hende ansvarlig for monitoering af patienten.
Abbreviations and explanations
The following common medical abbreviations have been used:
BP (blood pressure) measured in mmHg, P (pulse) measured in beats per minute, RR (respiration rate) measured in breath per minute, Temp (temperature) measured in Celsius, pt (patient), BS (blood slide), GXM (grouping and cross matching), Hb (haemoglobin), PPH (postpartum haemorrhage), UTI (urinary tract infection), IV (Intravenous), IM (Intramuscular), IU (international unit).

Other abbreviations used:
BDH (Busia District Hospital), ANC (Antenatal health Care), EmOC (emergency obstetric care), CO (clinical officer), ICU (intensive care unit), MO (medical officer), MOI (medical officer intern), COI (clinical officer intern), OPD (out patient department), CSD (consultant senior doctor), MDAs (maternal death audits).

Medication index:
Paracetamol: Pain relief and fever-reducing drug.
Diclofenac: (NSAID) taken to reduce inflammation and as a pain reducer.
Salbutamol: (Short-acting β₂-adrenergic receptor agonist) used for the relief of bronchospasm. Used to improve the breathing of a patient.
Quinine: Antimalaria treatment, with fever-reducing, pain-relieving, anti-inflammatory properties.
Oxytocin: A hormone used to contract the uterus and expel placenta in third stage of labour.
Hydrocortisone: A steroid hormone, used to reduce inflammatory reactions.
Metronidazole: An antibiotic (antibacterial), amebicide (treatment of amoebozoa infections), and antiprotozoal (treatment of protozoa infections).
Furosemide: (A loop diuretic) used in the treatment of congestive heart failure and edema, to drain the body from excessive water.
Clotrimoxazole: (A sulfonamide antibiotic combination of trimethoprim and sulfamethoxazole, in the ratio of 1 to 5,) used in the treatment of a variety of bacterial infections.

Medical tests:
Blood slide (BS) for malaria parasite: microscopic examination of blood for malaria.
Widal test: A presumptive serological test for enteric fever.

Collection of data, writing this paper and finding background literature as well as analysing this has been made in close cooperation between the involved parts: Mette Viuff and Sofie O. Skriver. As a criteria for summiting this paper as a group, we have to make it: "klart fremgå, hvilke afsnit den enkelte studerende er ansvarlig for"a. (Make it clear which paragraphs each student is responsible for). Therefore will each paragraph be signed by the author.

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ahttp://health.au.dk/uddannelser/undervis/medicin/undervisningogeeksamen/3semesterspaakandidatuddannelsen9semester/spec ialeforskningsmetodologi/#_Toc256429773
Background

Pregnancy and delivery of a baby is normally a happy and life-affirming event that most women aspire to some point in their life. But as life-affirming the event is as life-threatening it may become. Bringing a new life to the world carries a serious risk of death and disability for the mother as for the child. Maternal mortality is currently estimated at 358,000 deaths per year, a global ratio of 260 maternal deaths per 100,000 live births. Of this amount 1% of maternal deaths occur in the developed world. Maternal mortality ratios range from 620 per 100,000 births in African countries to 21 per 100,000 births in European countries.\(^1\)

One of the Millennium Development Goals developed by the United Nations is to reduce the maternal mortality ratio by 3/4 by 2015.\(^2\) The goal is falling short with only a minimal reduction in maternal mortality worldwide, especially in the sub-Saharan area where the problem is most severe. With only 4 more years to go we are still facing an unacceptably high number of maternal mortality cases. More tragically, most deaths are avoidable. The main causes are known, and more than 80% of maternal deaths could be prevented or avoided through actions that are proven to be effective and affordable, even in the poorer countries of the world.\(^3\)

In Kenya, annually there are 1,530,000 births\(^4\) and even though great effort has been made to decrease maternal mortality the ratio is still 530 per 100,000 births\(^5\). According to a recent report from WHO, UNICEF, UNFPA and The World Bank, there is an actual annual increase of 1.8 percent from 1990-2008, and therefore no progress towards improving maternal health in Kenya. One of the reasons for this high number is, among others, that only 44%\(^6\) of the deliveries are conducted by skilled birth attendants, and even when the mothers have made the effort to come to a trained health facility they are still not secure of having a safe delivery.

Numerous studies have been made trying to investigate the causes of the consistently high number of maternal mortality in developing countries. The most dangerous birth complications have been shown to be infections\(^5\)\(^6\), haemorrhage\(^7\)\(^8\)\(^9\) and hypertensive disorders\(^10\). Proper management of these conditions will reduce maternal deaths. However, this requires that health workers and communities develop the necessary capacity to respond appropriately to the management of emergency obstetric complications. Other studies examine the reasons for substandard care and target the availability of the emergency obstetric care services\(^11\). Some find that only a few health facilities meet the criteria for comprehensive emergency obstetric care (EmOC) and that the maternity staffs have poor knowledge concerning the concept of EmOC\(^12\). Some have looked at the different types of delays in getting treatment and also the attitude of the health care providers towards obstetric emergencies\(^13\). And yet others have found that
lack of facilities, equipment and poor organization contribute to substandard care. One thing is for certain: Bringing down maternal mortality is not possible when only focusing on a few causes. Many factors still have to change in order to improve maternal health, and the complexity will continue to be a challenge.

- Mette Viuff

Our data are collected in Busia District Hospital (BDH) located in Busia Kenya, a border town to Uganda. The hospital receives patients from the entire Busia district which covers areas in both Kenya and Uganda. The pregnant women often arrive in Busia as the third or fourth option as they first attend community based treatment, then goes on to dispensaries which consist of 2 basic delivery rooms and a nurse. Health centres are third level referral centres and often have educated personnel, consisting of a clinical officer (CO) and a nurse. From these health centres the complicated cases are referred on to BDH, which therefore often receives the women when they are in critical conditions. BDH does not have an intensive care unit (ICU) and for that reason refer women to provincial hospitals, if they are in a condition that require constant monitoring and intensive care. All kinds of birth complications occur within the hospital (see table 1).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Maternal monthly summary report, Busia district hospital 2010 (prior to our stay)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan</td>
</tr>
<tr>
<td>Admissions</td>
<td>296</td>
</tr>
<tr>
<td>Deliveries</td>
<td>260</td>
</tr>
<tr>
<td>SVD</td>
<td>215</td>
</tr>
<tr>
<td>C/S</td>
<td>17</td>
</tr>
<tr>
<td>APH</td>
<td>8</td>
</tr>
<tr>
<td>PPH</td>
<td>8</td>
</tr>
<tr>
<td>PET</td>
<td>6</td>
</tr>
<tr>
<td>Eclampsia</td>
<td>1</td>
</tr>
<tr>
<td>Malaria</td>
<td>11</td>
</tr>
<tr>
<td>Anaemia</td>
<td>5</td>
</tr>
<tr>
<td>Neo. Death</td>
<td>0</td>
</tr>
<tr>
<td>Mat. Death</td>
<td>2</td>
</tr>
</tbody>
</table>

Furthermore BDH is understaffed and only 6 of the recommended 22 doctors are employed at the hospital. The same is the case for the nurses, since only 86 nurses of the government recommended 150 are employed.

Busia was one of the first districts in Kenya to be introduced to the WHO focused Antenatal health Care (ANC) package on a pilot basis in 2001\textsuperscript{17}. WHO recommends a minimum of four ANC visits. However,\hfill

\begin{itemize}
\item[A] spontaneous vaginal delivery
\item[B] caesarean section
\item[C] antepartum hemorrhage
\item[D] postpartum hemorrhage
\item[E] preeclampsia
\end{itemize}
studies show that 40 percent of Kenyan women had not attended a single ANC visit by the start of the sixth month of pregnancy. The median duration of gestation at first ANC visit was 5.7 months. Each visit should include care that is appropriate to the overall condition and stage of pregnancy and also secure that the woman is HIV tested and given treatment in case of malaria. According to UNICEF, 92% of the Kenyan pregnant women attend antenatal care at least once, and 47% of these women attend the clinics at least four times. At the clinics they are given a mother and child book, which follows them during their pregnancy. The book is also brought by the mothers when going to deliver at the hospital. This enables the health staff at the delivering facility to register the women baseline vital signs, haemoglobin (Hb) level, blood group, HIV status and other helpful parameters during delivery (mother and child book is attached).

The objective of this paper is to examine the causes of maternal mortality and near-misses of pregnant woman admitted to BDH in Kenya. We will observe how the health staff’s handles emergency obstetric care and present our observations as cases. We intend to include the health staff’s reflections on reasons for the development of complications and their management of these. In the end we will discuss what causes these life-threatening events and how to prevent the situation.

- Sofie O. Skriver

Material and methods

Methodology

Data collection took place at Busia District Hospital in Kenya at the Maternity and Gynaecology ward form February 7th to March 11th 2011. Cases were identified mainly through our own observations in the working hours, but also from the staff on duty at night. To achieve the best descriptions of the identified cases and the circumstances of their treatment, we used different data sources: 1) Our observations, 2) staff interviews 3) patient files, 4) ANC book notes and 5) interviews of patients and their relatives. Staff reflections were conducted through interviews in private settings and were recorded by dictaphone and subsequently transcribed.

Staff was of the following professions: nurses, Medical officer (MO), Clinical officer (CO), MO intern (MOI), CO intern (COI) and students. COs have a 3 years medical college education, MO have a 5 years medical university education. Both CO and MO have one year of internship after the final exam. When doing their internship they are responsible for the daily clinical work (together with the students) in the ward. There are one MOI and one COI in each ward. MOIs perform the caesarean sections. The senior doctors (MO) do clinical reviews in the mornings (when they are around) and are on call on the rest of their duty.
Literature search

Literature was found during a systematic search on the following databases: Pub Med, Google scholar, Trip Database, UNICEF and WHO. The following keywords were used: Maternal mortality, maternal death, development country, Kenya, near-misses, birth complications, emergency obstetric care, pregnancy, substandard care, delay and organization. They were used individually and combined.

Definition of terms

The following definitions were used as inclusion criteria of cases.

**Maternal mortality** was defined by the International Classification of Diseases, 10th edition (ICD – 10), and is "the death of a woman while pregnant or within 42 days of the end of the pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes."  

**Near-miss** events are defined as any pregnant or recently delivered woman (within 42 days after termination of pregnancy and childbirth) who develop "complications that immediately threaten the woman’s survival but do not lead to her death". The events considered five main diagnostic areas:

1. haemorrhage (leading to shock, emergency hysterectomy, and blood transfusion),
2. hypertensive diseases of pregnancy (eclampsia and severe preeclampsia),
3. dystocia (uterine rupture and impending rupture),
4. infections (hyperthermia or hypothermia or a clear source of infection and clinical signs of shock),
5. anaemia (low haemoglobin level (<6 g/dl) or clinical signs of severe anaemia in women without haemorrhage).

Ethics

The ethical guidelines for research in Denmark have been followed as closely as possible. Considering that the study is conducted in Kenya under Kenyan conditions, local cultural and ethical norms also have been attempted respected. Since this study is a scholar exercise, and the material is solely intended used for an educational purpose, application for study permission is confined to the hospital administration and permission has not been applied at other authorities.

From the start it was important for us to inform the staff of the purpose of the study and the collection of information. We emphasised that the aim was to make a detailed investigation to describe causes of maternal complications. Staffs were asked for their participation in interview in private settings. Anonymity among all informants has been respected. The hospital administration will be informed about the study results.

Presentation and permission
Before departure to Kenya we e-mailed the doctor in charge at the hospital administration to ask for a written permission to collect data at the hospital for a school project. The permission was send back to us subsequently. We arranged a meeting with the administration on our arrival, on which we presented the aim of the study, our intended study population and method of data collection. We gave a similar presentation to the health staff (students, interns, seniors and nurses) in the maternity ward as well as in the gynaecological ward. We asked the staff for their assistance identifying cases when we were not around.

For case inclusion the ideal situation would have been getting permission from every woman individually or her relatives in case of death. Unfortunately, the circumstances didn’t allow this. Only for cases, where we were involved our self, permission was achieved by personal accept. In the other cases permission was achieved from the hospital administration.

Data analysis

Every Thursday all information from ANC books and handwritten health records/files were reviewed and detailed notes were developed. Health staff helped interpret when the handwriting was illegible. Our own observations were noted in a notebook and were likewise transferred to computer. Interviews recorded on dictaphone were transcribed.

The collected information was categorized, summarized and presented as case stories. Comments and staff reflections from interviews were divided into topics and presented in summarized form. Staff gave specific comments on two cases. These comments are presented in textboxes under the respective cases.

Results

Background parameters

A total of 8 cases were collected, of which 5 died and 3 were near-misses. Main complications were infections, haemorrhage and hypertensive disorders.

The age of the women ranged from 20 to 31 years, the median age being 25 years. Numbers of pregnancies ranged from 1 to 5 with no certain pattern. 3 were HIV positive, 2 negative and 3 with unknown HIV status. Of the 5 women who died 2 were HIV positive, 1 was negative and 2 were not known. 3 cases were admitted to BDH due to delivery and hence had brought their mother and child book. They had all attended ANC clinics 4 times prior to admission. The women who were admitted to BDH due to infections, ectopic pregnancy, abortion and eclampsia did not bring their mother and child book and therefore we were not able to register their attendances to ANC. Of the 8 cases, only one is known to
have an education above primary school, and she sought hospital help in spite of staff at ANC telling her otherwise. Days of admission ranged between 1 day and 5 weeks, with a median being 2 days.

-Mette Viuff

**Case stories**

**Case 1**

A 23 year old HIV positive woman was admitted to the hospital by a CO student a Wednesday afternoon with symptoms of malaria and Premature labour/ Threatened abortion second to malaria. Gravida and para\(^b\) are unknown for this case. Neither last menstrual period (LMP) nor expected date of delivery (EDD) was known, but on examination the fundal height was estimated to 20-22/40. No vital parameters were recorded. Prior to admission one dose of quinine had been given. No malaria blood slide (BS) was made. Continued quinine treatment was prescribed together with paracetamol, diclofenac and salbutamol.

The condition of the patient improved until Friday when she developed cough, chest pain and dyspnoea at rest. A senior doctor reviewed the patient. The doctor didn’t record any vital parameters but the patient (pt) was *clinically febrile*\(^i\) and classified as *NYHA*\(^j\). No stethoscopy of the lungs or heart was performed. Oxygen was not given as it was not available in this ward. A Widal test was ordered and came back negative. Saturday at 3:00 a.m. antibiotic treatment was started.

Sunday morning the nurse found the patient in a *changed condition and not talking*\(^k\), the blood pressure (BP) was 108/71, Pulse (P) 70, respiration rate (RR) 18, temperature (Temp) 35. She ordered a senior MO review. According to cardex a COI reviewed the patient at 9:00 a.m. The doctor didn’t make any notes in the file. Antibiotic and malaria treatment were continued, 40 mL intravenous (IV) 50% dextrose was given and a new BS was made - it came back negative. At 12:30 p.m. the senior MO came to the ward, but he never saw the patient as he was called elsewhere. He never came back. At 5:30 p.m. the BP was 123/92, P 155 and Temp was 38.9, Diclofenac was given. At 6:00 p.m. a MO student coincidentally passed by the ward and was brought in to see the pt. He found her unconscious, very febrile and in res-

\(^i\) quote from patient file
\(^b\) The terminology used is gravida \(X\) (gravidity) and para \(a+b\) (parity).
- \(X\) is the total number of pregnancies (including this one).
- \(a\) is the number of births beyond 24 weeks gestation.
- \(b\) is the number of miscarriages or termination of pregnancies before 24 weeks gestation.
\(^j\) New York Heart Association (NYHA). Functional Classification that provides a simple way of classifying the extent of heart failure. Class four is the most severe and is classified as symptoms that gives “Severe limitations. Experiences symptoms even while at rest. Mostly bedbound patients” (form www.wikipedia.org).
\(^k\) quote from patient file
piratory distress using accessory muscles and with intercostal recession'. BP 103/81, RR 35, Temp 38.4. His prescription was IV Paracetamol although this drug is never available in the hospital. Oxygen was still not available on the ward. The patient passed away a few minutes later. No cardiopulmonary resuscitation was preformed.

**Box 1: Staff reflections of case 1:**
The pt wasn’t seen by a doctor between 9:00 a.m.- 6:00 p.m., why is that?: "In the weekends the doctors only see the pt who change condition... this mother had been reviewed by a senior on Friday and was being treated and on right medicine." Later in the interview the employed gives this explanation: "Because of bad priority, TIA! (This Is Africa)"

- Sofie O. Skriver

**Case 2**
24 year old, gravida 4, para: 2+1, was admitted to the hospital 3 days prior to her death with severe anaemia and the impression of chronic malaria. She received one unit of blood on the day of admission, but no other treatment. In the evening the same day, the nurse noted in the cardex that the patient was having difficulty breathing. No MO was called and the patient was not seen by a doctor for two days while her condition was deteriorating. On the third day of admission a senior doctor saw the patient, the foetus was now dead. The senior MO planned to induce labour and to pass the patient on to a physician. But no initiatives were taken and two hours later the woman’s condition worsened. She became distant with her eyes facing upwards, and did not respond well to speech. Her BP was 166/112, P 91, RR 60 and Temp 35. Oxygen was available, but only a flow of 2L was given. No mask was available, so a tight-closing ambu-bag mask was used. The second unit of blood arrived and was administered, but shortly after the patient died. Out of the three days admission, the pregnant woman received one dose of quinine on the second day. No loading dose was given prior as she was admitted by inexperienced staff. Even though 2 units of blood were prescribed on admission, it was only possible to get one unit of blood. The second unit arrived two days later right before she passed away. The woman might have died due to chronic malaria deteriorated by pregnancy. The delay in blood transfusion and quinine treatment didn’t improve the situation..

- Mette Viuff

**Case 3**
A 31 year old (unknown gravida and para) woman pregnant in about week 20 was brought by relatives to the Out Patient Department (OPD) at 4:25 p.m. with complaints of pelvic bleeding since morning. A diagnose of preterm labour was suggested by the OPD doctor and he admitted the patient to the hospital

\footnote{quote from patient file}
without any examination. She arrived to the ward at 5:11 p.m. in a critical situation, very weak and unable to stand. No MO was at work and none were called. At 5:30 p.m. she was still bleeding. The nurse made a speculum examination and a manual vacuum aspiration. Cervix was found wide open and cyanotic in colour, there was a foul smell and minimal products of pregnancy were extracted. Under the examination the patient told (for the first time) that she had had a miscarriage at home around 9:00 a.m. It was unknown if it was a miscarriage or an induced abortion. Induced abortion is illegal in Kenya.

Blood for grouping and cross matching (GXM) and Hb was collected and IV oxytocin 10 international unit (IU) in/500 mL saline stopped the bleeding. Oxygen was not available in the ward. At 7:15 p.m. the night shift nurse found the patient restless, with severe abdominal pain, BP 97/56. This was the first time the BP was measured, P 102 and RR 22. She calls the nurse in charge to call the MOI. The patient passed away 10 minutes later. Neither the MOI nor the blood ever came. Because blood-screening equipment was out of stock in Kenya during that week, emergency blood for transfusion was not available. The mother died of postpartum haemorrhage (PPH) after either a miscarriage or an induced abortion.

**Box 2: Staff reflection of case 3**

**The lack of blood:** "the laser kit is out of stock in the whole country, even now it’s not there, blood was there but it couldn’t be tested.”

**The MO talks about delay in handling this patient:** "That time when the patient came to the OPD most of the staff was gone home, most of the nurses that always do TRIAGE were gone home, so it is that critical hour from changing from one shift to another!"

"The outpatient guy (COI) doesn’t raise alarm, whoever is at outpatient, your job is to filter... if this is an emergency you need to run, but most of the time the outpatient people are not very keen. Lacency! …there is inadequate evaluation of the patient in the outpatient; the CO...don’t even realise that his patient is actually bleeding, nobody even touched the abdomen of the patient, there was no fundal height so how can you say preterm labour if you don’t even touch the abdomen… in Out Patient Department he should had said incomplete abortion, he at least should have tried to do a vaginal examination”

- Sofie O. Skriver

**Case 4**

28 year old pregnant woman was seen in the outpatient department by a senior doctor at 6.50 a.m. She complained of severe abdominal pain and had lower abdominal tenderness. He found her with severe pallor and the impression of anaemia. He planned for her to have ultrasound, and to transfuse her two units of blood. None of these prescriptions were carried out immediately and instead she was transferred to medical ward. Here she was seen by a medical student at 10.00 a.m. She was sent to ultrasound accompanied by her relatives where she was diagnosed with ruptured ectopic pregnancy at 11.30 a.m. She was now transferred to Gynaecological ward where they received her in a critical condition, restless and

gasping. The intern called the senior doctor who was around and came immediately. They tried to get IV access and administer fluids and one unit blood. The internal bleeding was now so severe that she collapsed and stopped breathing at 12.25 p.m.

On admission the vital signs were recorded. There was a time window of 5½ hours from admission where she was stable (BP: 139/110, PR 56, RR: 17 BPM) until 12.25 p.m. when she died.

- Mette Viuff

Case 5
28 year old, gravida 5, para: 4+0, HIV positive woman was admitted to the hospital Monday with complaints of low abdominal pain, mild pelvic bleeding and symptoms of urine tract infection (UTI)\textsuperscript{m}. She was in a bad general condition with a poor social background and no relatives. She had a known history of prior admissions through pregnancy due to HIV related infections. Treatment for UTI was started. In the evening she gave birth to a healthy male infant. The delivery was uncomplicated, placenta was complete, membranes were intact and no tears were found. 10 IU intramuscular (IM) oxytocin was given in the 3. stage of labour. The patient refused to have remaining blood clots removed and she developed PPH. She was transferred to the post labour room in a stable general condition but still bleeding.

Wednesday was the first time a doctor saw her after the delivery. She was still bleeding (the amount was not recorded) and was complaining of dizziness. She was pale and sick looking, had a BP of 94/54 and a P 112. A vaginal examination was prescribed but was never done. One unit of blood was ordered and transfused.

Thursday morning at 11:00 a.m. the speculum examination was preformed, remaining clots were removed and the bleeding stopped. The vital signs were normal except from a Temp of 38,5. At this point the patient was confused, disorientated and extremely weak. 250 mL IV saline was administrated (oxygen was not available) and antibiotic treatment was started. At 1:00 p.m. Hb results arrived, the Hb was 1,6 g/dl. 1 unit of blood arrived soon after, but cold as in the fridge, where it had been stored. The heating process delayed the transfusion; it was not started before evening.

Friday morning the patient was sick looking, restless, confused, pale ++ and febrile with cold extremities. The CO that saw the patient wanted to prescribe blood for transfusion, but because no relatives had been at the hospital to donate blood, she was not allowed to get more. Instead 500 mL 5% dextrose IV was given.

At 11:00 a.m. the patient was found disorientated and nonspeaking, with a temperature of 40 axillary, sweating and with sever chills. The thermometer had to be borrowed from another ward. Without luck, an attempt was made to get the COI to come in order to put up saline and consider the treatment.

\textsuperscript{m} Cited from patient file
At 12:30 a.m. the patient was found in her bed unconscious, gasping, with severe peripheral cyanoses and a BP of 111/57 and a P of 115. Again the COI was called who again refused to come and instead asked the nurse to “calm the patient”. After a scold by a medical student action was finally taken. 500 mL IV 5% dextrose and IV hydrocortisone was given and blood for BS and Hb was collected. The pt condition improved for a short time until 2:35 p.m. where she became again unconscious with a BP of 86/52, P of 112, RR: 28 and Temp 40 axillary. The MOI diagnosed septic shock and ordered metronidazole and 250 mL of saline. But the nurse never started the infusion of saline because she feared that the patient would be overloaded. Meanwhile lab results had arrived - no malaria parasites were found and the Hb had been measured to 9 g/dl. The MOI shook his head and said that “the lab is unreliable”, his clinical guess was that the Hb was 4 g/dl. He ordered 1 unit of blood for transfusion and phoned the MO in charge to come for review. The MO in charge never arrived.

At 22:00 blood transfusion was started and the condition of the patient improved over the night and the following days.

This woman was nearly dying because of PPH complicated by HIV related infections. The lack of blood and lack of action from the doctors complicated the situation.

- Sofie O. Skriver

Case 6

26 year old, gravida 1, para: 0+0, was admitted to the hospital due to severe oedemas of her lower limbs, the external genitals and the face. On admission she had headache, blurred vision, and her blood pressure was 170/110. Therefore she was immediately treated with antihypertensive drugs. Three days later she went into labour and at 11:45 p.m. she delivered a live infant. Due to an oedematised cervix she had a 3rd degree tear and the woman developed PPH. The doctor on call was informed and available in the ward next door. He arrived immediately to control the bleeding and to prescribe saline and blood transfusion. However the blood did not arrive immediately and at 2:00 a.m. the nurse registered that the patient had developed signs of impending shock. She had become very pale with cold extremities, dizziness and blood pressure dropping first till 111/77 then to 93/53 and with a Temp of 35.2 degrees. She was provided with an extra blanket and her feet were elevated. At 2.30 a.m. the blood
arrived and she was transfused. She survived through the night and in the morning she had gained consciousness. The antenatal mismanagement led to severe eclampsia and ultimately a life threatening PPH.

- Mette Viuff

Case 7

20 year old, gravida 2, para: 1+0, reached out patient department at 6:00 a.m., and was admitted at 10.00 a.m. to maternity ward with symptoms of headache, mild convulsions and fever for the last couple of days. Her BP was 175/116, Temp 36.7 and she had moderate oedema. An infusion of MgSO4 was given and the woman was left attended by relatives, unmonitored and weak. At 11:20 a.m. she was found coughing, with severe crepitations on both lungs. BP was 192/134, P 125 and RR 27. An attempt was made to contact the doctors and nurses for assistance in getting oxygen and furosemide. But the nurses did not respond and the doctors wanted to finish the ward rounds. At 11:45 a.m. the patient was seen by the group of doctors and a decision of emergency caesarean section was made. Lab results came back with pH 6.5, severe proteinuria and ketonuria. No oxygen was available in the ward, and the furosemide had exceeded its last day of use, hence was not given. She reached theatre in a life threatening condition with foam coming out of her mouth and nostrils. She was aspirated and ventilated by mask while she had caesarean section. Furosemide in theatre had also expired and a new order was made from the pharmacist. The furosemide arrived and 100 mg was given. A live infant was delivered but the mother was still in a critical condition with Oxygen saturation ranging between 35-70% and pulse rate of 160 during the operation. Another 60 mg furosemide was given after the procedure, and the mother was ventilated in the following hour until 13:30 p.m. She was now reviewed by a senior paediatrician, who recommended transferral to a hospital with an ICU. Before transferral, the patient was brought to maternity ward where she was left in a 6 person room with no proper working suction or oxygen. Although the surgeon prescribed “monitor vital signs ¼ hourly till fully awake” and to register an “input/output chart “, none of this happened due to the lack of nurses. At 3:20 p.m. the BP was 155/115 and P 154. At 5:00 p.m. an ambulance had been prepared for the two hour drive to an ICU in Kisumu. No antihypertensive medicine was given and the diastolic blood pressure was not at any time reduced to the recommended level of between 90 and 110 mm Hg. This near-miss case happened due to delay in treatment and insufficient remedies.

- Mette Viuff

Case 8

25 year old, gravida: 5, Para: 1+3, HIV positive mother was admitted to the hospital with symptoms of malaria and vaginal candidiasis. She was treated with clotrimoxazole and paracetamol and started treatment for malaria two days later when her malaria test came back positive. The foetal heart rate was noted to be present and regular. Two days later she started having contractions and went into labour; on
examination the foetal heart rate was noted to be faint and irregular. Since this note was made at the very end of her shift, the midwife didn’t contact the MO herself, but wrote a note in the cardex for the next midwife to call and inform MO. This was never registered nor done. Later the same day another midwife examined the foetal heart rate and noted it to be irregular, but still the MO wasn’t informed. At 9:00 p.m. the mother gave birth to a dead female infant, the nurse noted in the cardex, that “Membranes ruptured and were meconium stained grade III”. At 10:00 p.m. the woman’s condition changed. She became restless, developed heavy sweating and cold extremities without being febrile. Now the MOI was informed and examined the patient. Found that the uterus was well contracted and that there were no clots, tears or heavy bleeding. The MOI gave the pt 500mL saline and took blood for Hb and GXM. At 1:25 a.m. Saturday the patient stopped breathing. No monitoring between 10:00 p.m. and 1:25 a.m. was noted. No decision of transferral to an ICU was made, nor was oxygen given at any time. The patient was neither reviewed nor consulted by a senior doctor. The patient might have died due to an amniotic embolism or sepsis. Her child possibly died from the prolonged labour.

- Sofie O. Skriver

Staff reflections

Some of the significant factors and frequently mentioned reasons of maternal mortality were shortage of staff and equipment, delays in coming to the hospital, ANC mismanagement and poor organization.

Shortage of staff and equipment

When interviewing the staff we found that the blame for the cases of substandard care was mostly projected to the level above and sometimes to the level beneath themselves. If a nurse was asked, she blamed the interns or senior doctors, if the interns where asked they blamed the hospital management, lack of equipment or the nurses. And when the administrator was asked, the reasons for mismanagement were due to the countrywide lack of blood testing kits. Though, some nurses did express their frustrations when telling about lack of health workers, and assured us they were not content. “There is shortage of medical workers. It is really bringing us problems. We feel like we should be doing the right thing, but you will be getting late charging something when somebody is yelling. This is our problems. But it is not our wish.” (nurse). The shortage of staff was repeatedly an issue among the nurses being interviewed. “Sometimes you can find yourself; you are alone in the whole of maternity. And you know it is not like in other hospitals were antenatal and postnatal’s are separated. It’s all in the same unit and your only one person. And you are also to handle the babies in the nursery, it really becomes a challenge. As much as you wish to, you are just overwhelmed by the workload. Maybe you only handle the persons you find likely to develop complications. But it’s hard; the complications can even come in the
third stage of labour.” (nurse). The shortage of staff influences and decreases the level of patient monitoring. “Sometimes it (vital signs) is not taken, just because we are busy so much and confused. And you find that if just the patient is breathing it’s okay. Let’s now deal with this one first.” (nurse). The statements of the nurses was supported by an MOI “sometimes there are only two nurses, for them to monitor all these patients it’s difficult.”

Complaints over hospital remedies were a factor that all health workers mentioned across their educational level. The numbers of the investigations possible in the lab were limited and the laboratory answers were inaccurate. “Here the results vary so much, you can’t really rely on it. They don’t do electrolytes, blood gas analysis and things like that. And the things they do are very inaccurate.” (MOI).

Also the availability of blood was not reliable. ”If we take the example of bleeding emergencies, the challenge of availability of blood… Sometimes we are forced just to do a rapid test otherwise the person dies”. (Senior consultant doctor). Even the sterilisation of the delivery sets was a problem. “You find that we are too busy so mostly it is just cleaned. It is not autoclaved. We decontaminate it only with DIC®. I feel like we are lacking an autoclave machine inside here, because if you prepare and take to theatre, all night they will not be back. Then we shall stay without.” (Nurse).

Also equipment and capacity in theatre was mentioned as a factor in mismanagement of birth complications. Since BDH only had one poorly equipped operating room, women for emergency caesareans were often put on hold while another surgical patient was being operated on. “She is not going because theatre is just one, and they are having an operation there. There is an intestinal obstruction, somebody is being operated. So she waits until that operation is over.” (Nurse). And lack of spare parts ”It (the monitor) is not functioning; to repair it we need a quarter million. The problem is equipment, they are very expensive and the government cannot supply. I use myself, my hands and my brain” (CO anaesthetic)

Training
When asked about their level of training they all expressed a wish for more. “Yeah, I think it would be advantageous to me and even to the patients. Because I would be in a better position, know what to do and how to treat. If the doctor is not within reach. You’re able to manage the patient effective” (Nurse).

None of the nurses interviewed had received any EmOC training. “Me, I was in “outpatient” and mostly I was in mental health centre. So apart from college I have had no training.” (Nurse).

- Mette Viuff

DIC is a decontaminating product used for cleaning equipment.”
Delay in seeking hospital and deficient antenatal health care (ANC)

Delay in seeking professional help by the pregnant was mentioned by the staff as an important contributory factor of the development of severe complications: “...the patient comes late, they don’t seek health facilities early, they come only when they are really sick.” (MOI).

Different causes for these delays were suggested: Traditional birth attendant was often the first choice when seeking help due to cultural traditions as well as economic limitations: “…hospital usually is second option... They feel that hospital is just too expensive for them... (the women are) being handled out there by a traditional birth attendant, these women don’t have any midwife knowledge, but deliver women” (nurse). And further “They (the traditional birth attendant) bring them to us when they are very complicated” (nurse), e.g. the hospital had a case of ”Obstructed labour for three days, actually when they came here the baby was already long dead, and the mother was at big risk, some even die before they reach” (Senior consultant doctor/administrator).

Another suggested reason for the delay was ignorance: “Most of the patients... are not really aware of what they are suffering and what it can dispose them to. By the time they come here ... there is very little you can do” (Medical student).

Deficient ANC was mentioned as a contributor to the development of complications. Women neglected or were ignorant of the impotence of ANC “Maybe they don’t attend the clinic (ANC). Most of them they just go for the sake of getting a card (the mother child book). Some only go once. So the following up becomes a problem”. And the mothers abstained from using the information and instruction given by the ANC: “Sometimes these mothers don’t obey the rules their given antenatal. Because you find that some of them are advised that they can’t deliver at home, but anyway they go to traditional birth attendant and that complicates the delivery (Nurse). In other cases were the management by ANC clinics incomplete which impeded the maternity staffs’ work: “...a few cases of mismanagement, (ANC are) not taking the baseline vital signs. So by the time they (the mothers) are coming, you don’t know what the problem is”(nurse).

Poor organization and difficulty finding people

The staff mentioned lack of work organisation as one of the causes of substandard care. Deficient preparation of the theatre was mentioned “sometimes there is a case for theatre, but you find that they haven’t sterilised the things, because there is no electricity, or it takes them time to prepare everything.” (MOI).

Another problem in the organization of the work was doctors that weren’t available or around when they were supposed to. This was especially a problem during night: “Sometime when you need an ultrasound, at night it is closed, so you have to wait for the person. If it is an emergency someone has to go and fetch the ultrasound technician to come. He stays in his house... a car has to go for him to come... in an
ideal setting it (ultrasound) should be available for 24 hours.” (MOI) The doctors were at sleep at night contributed to delay according to a nurse: “Somebody is just sleepy and sometimes just continues to sleep. And sometimes when you call them (the doctors), they feel that maybe the problem is not all that serious. So they come lazily.” … “when you call them they take long. Like the mother who lost the baby (this is not a cases of this article), she was bleeding before the delivery. I was told that the doctor took so long to come, so when the patient was in theatre she was seriously bleeding. So if they (the doctors) can be prompt things can be okay.”

On the contrary when asking the senior consultant doctor delay from the staff was rare: “Yeah, occasionally we have delays. I know of a patient that died, I don’t know if the delay was on our part. (Delay) from staff… (is) rare!”

When asking if the poor organisation could be improved, the answer was: “Okay, there is room for improvement, but the resources are not available.” (MOI)

- Sofie O. Skriver

Discussion

A total number of 8 cases with the outcome of either death or near-miss were collected. Most important complications were infections, haemorrhagic and hypertensive disorders. Several issues of substandard care surrounding the management of pregnancy related problems can be identified, both through the cases and staff reflexions.

In the following we want to discuss the main issues that led to this substandard care. Key points are: Lack of facilities, equipment and treatment opportunities, poor organization concerning available medicine, working and treatment procedures, lack of educated personnel and poor communication between the health workers.

- Mette Viuff og Sofie Skriver

We can only comment on the episodes that happened while we stayed at Busia Hospital. Therefore this is not to be considered as a comprehensive analysis, but a case study of individual episodes. We have retrieved data from different sources like interviews, observations and case files to increase the trustworthiness of our findings. Furthermore, we made interviews with a great variety of staff, patients and relatives.

The validity of our project is also strengthened by the fact that we stayed at the hospital in a period of three months. During these three months we worked full time. This way we were able to get good relations with the staff and experienced many different emergency situations.
The case stories and staff reflections elucidated several issues of how inadequate hospital facilities and opportunity for treatment contributed to the development of severe complications when giving birth.

Lack of equipment and oxygen for therapy

Lack of equipment such as BP-, saturation- and thermometers was a problem that caused delay in or even wrong choice of treatment and diagnose. Case 3, a woman with severe PPH, is an illustrative example of this problem. The woman’s BP was not measured until 3 hours after the admission, ten minutes before she died of her haemorrhage. The severity of the haemorrhage might have been diagnosed earlier if vital signs had been recorded, and this might have saved the woman’s life. Another limitation and serious problem on BDH was lack of oxygen for therapy. Without oxygen the staff was unable to give appropriate treatment to the patients. In the maternity ward as well as in the gynaecological ward oxygen was not available. The nearest oxygen access was found in the neonatal unit or in the theatre, but these sources were most of the time occupied by other patients. Another opportunity was to borrow the container from the private ward, but this option was not used in the period of this research. The difficulties in getting oxygen had contributed to an attitude problem among the staff that had been adapted to the limitations. The staff seldom considered oxygen therapy as an option, as they seldom took proper action in trying to provide oxygen, even though an available oxygen container could possibly have been found. In case 1 the woman developed severe respiratory problems as part of the complication that caused her death. The senior doctor who saw the patient diagnosed “dyspnoea in rest” – and categorized this as “NYHA4”. Hours/minutes before she died she had a RR of 35 and was: “using accessory muscles and with intercostal recession”. If oxygen had been available for this patient her fate might have been different.

The attitude among the staff needs to be changed; the staff might at least consider if oxygen could be an option. However, it is difficult to change the number of oxygen containers and other equipment, because of general shortage of resources. An idea could be to make an oxygen treatment room, where the oxygen containers are stationary and patients are brought in for treatment. This would increase the availability.

Medicine and fluids

Limitations in availability of medication were another issue that caused complications to develop and bring women in severe danger. Parts of the limitations were due to lack of economic resources. Part arose due to attitudes and traditions among the staff or inadequate training of staff. And part was due to lack of organization.
Economical limitations caused restrictions in use of e.g. fluids and pain medicine. The hospital pharmacy often did not have the medicine that was prescribed, why relatives had to go and buy the medicine elsewhere. Unfortunately, this caused daily that the patients were left without their in some cases life-saving medicine, because the patient had neither money nor relatives. This was an issue in case 3 where paracetamol as IV injection was prescribed even though the medical student knew it not available at the hospital.

In management of almost all of the cases there has been inadequate use of IV fluids. This was an important contributor to the amount of maternal mortality on BDH. An example is case 3 where a woman died of PPH. In the 3 hours she was at the hospital and bleeding, she only got 500 mL of IV saline. Also malaria treatment with quinine was inadequate, in most of the cases the loading dose used was 600mg instead of the recommended 1200 mg. As described above part of the problem was due to economic limitations. But sadly it was also due to staff, including students that lack training and experience. An attitude of “laissez faire” and a tradition of restriction, especially in the use of fluids, seemed to have developed among the staff. The tradition of restriction may have developed as a result of a long history of a general lack of all necessary “everything”: food, beds, medicine etc. To change the problem, more strict guidelines for medication and fluid therapy should be available to make treatment standardized and not based on individual assessment.

Lack of organization and preparation of easy access to emergency medicine also contributed to problems. In the labour room there was a box for emergency medicine. However, the medicine was often missing or had even exceeded its last day of use. This caused a near-miss in case 7. The woman developed severe lung oedema with a saturation of 35% as a complication to eclampsia. The last day of use was exceeded of the furosemide that she needed, both in the labour room and in the theatre emergency medicine box. It delayed the treatment and caused the critical situation to develop. In the future a situation like this might be avoided by introducing routines or improve existing to ensure that medicine boxes are updated daily.

**Shortage of blood and poor priority**

Shortage of blood and delay in blood transfusion has been shown in a number of studies to be a reason for mother mortality. Also in this study lack of blood in the hospital “blood bank” was a problem. A problem that has led to restrictions so that only two units of emergency blood was available per patient, unless relatives donated more. Case 5 is an example of this. A third blood transfusion was necessary, but because the patient did not have any relatives to donate, blood was not given.

In certain periods no blood was available, as in cases 3 where the mother died of PPH without receiving a single unit of blood. One reason for this lack was that blood-screening equipment was out of stock in
the whole country.
In the future more effort could be done to increase the amount of blood in the “blood bank” one method could be campaigns for donation in Busia town and in the hospital.

The delay in administrating blood was caused by (besides the delay the short supply of blood causes) both poor priority when handling the complications and lab limitations. Examples of bad priority were case 4 and 3. In both cases the women died of haemorrhage. The OPD doctor was the first who saw the patients. I case 4 he prescribed a blood sample for GXM instead of taking on. In case 3 he did nothing to prepare blood transfusion. In both cases the doctor should have taken the sample himself right away. If this had been done, the process of giving blood transfusion would have been faster, from the point when it was realised that blood transfusion was necessary. He should also have secured IV lines and started infusion of saline. Delays can be avoided and life saved if the hospital administration introduces procedures where blood for GXM is taken and IV line access is secured right away for all patients where the doctor suspects haemorrhage.

Laboratory limitations
Laboratory limitations at BDH had been shown to be a problem that resulted in delays of diagnosing and treatments of complications. Manual procedures of GXM as well as heating blood delays acute blood transfusions. This was the case in case 5 where transfusion were postponed many hours, because the blood arrived cold and first had to be heated; this was done on the skin of the patients (she had a Hb of 1,6 g/dl). Lack of equipment for biochemical investigation, such as blood gasses, complicates or even hinders correct diagnoses. Regrettably not even the available lab facilities could or should be trusted since they apparently often produced results with major errors. As in case 5 where the first Hb result was 1,6 g/dl and the second (1 portion blood and 1 day after) was estimated to 9 g/dl. It challenged the doctor’s clinical knowledge and keenness to prevent near-misses and death. Lack of option for investigation caused that diagnosing often was a guess where the most plausible diagnose was picked as target for the treatment. Economical limitations make it difficult to expand the facilities within the hospital. Therefore this is not an option when trying to lower the diagnostic errors. Clinical experience has shown that expertise from senior doctors help lower the risk as they can rule out questions and detect errors when reviewing the patients. But unfortunately it had been shown that the reviews as well as assistance from seniors were often delayed or even absent. It caused that possible avoidable deaths were not avoided. In case 1 the senior doctor was called in the morning for assistance, but when the woman died in the evening the senior had still not been there to review her. Effort should be made to secure that a senior is always available. However, this was a difficult problem to solve when only 6 out of 22 recom-
mended doctors were employed by the government.

- Sofie O. Skriver

Lack of staff, different attitudes towards emergencies, need for more education among the health workers, bad organization of work procedures and poor communication were serious problems in the handling of life threatening situations at BDH.

Training

An important factor when it comes to handling pregnant women and perinatal complications was the level of education among the staff both at the ANC clinics, where the women received guidance during their pregnancy, and among the health workers within the hospital. Often the staff in the ward was taught by other more experienced workers who themselves has adapted to the principle of learning by doing.

The near-miss woman with preeclampsia (case 6) is an illustrative example of antenatal health workers missing vital information, due to either ignorance or poor education. She was admitted very late on her own initiative in an advanced stage of preeclampsia. She sought hospital admission in spite of the advice given from the ANC clinic. Here they had simply told her to go home and elevate her legs. To prevent this from happening in the future, there is need for more education of the nurses at the clinics or provision of a backup MO.

According to the “nurse officer in charge” the last training of health workers in the ward was in 2009. They were supposed to have training once a year but the resources available for development and education depended on donations from non-governmental organisations. Therefore funds were very unreliable. Another problem concerning education level was instability of staff in the ward. Among the nurses only one had been working there for more than two years and was therefore the most experienced nurse in the maternity ward. She reported never to have received any emergency obstetric care training; hence none of the other nurses have had any. If the nurse who managed case 6 had had EmOC training, she would have been able to pack the bleeding by herself while waiting for a doctor. With the great replacement, there was a need for more regular training among the staff. This would make them confident to handle emergency situations while waiting for a doctor.

Lack of education was not only a problem concerning the nurses. Because of lack of educated doctors, the ward was mostly run by interns and medical students. Hence the students suddenly had a great responsibility which they occasionally did not have the skills to fulfil. The severity of this came to expression in the case of the ectopic pregnancy (case 4). The appropriate diagnosis was made on arrival, but
the woman was sent to a wrong ward to an obstetric inexperienced medical student. Hence the treatment was delayed and this caused her death.

**Bad organisation of work procedures and poor communication**

The severity of case 4 is enhanced by the fact that this did not happen due to lack of remedies, poor facilities or transport delay. The young woman was stable when she reached the hospital in the morning and she died because of human delay and bad organisation. The first delay was made from the OPD, when they decided to send her to the ward instead of directly to ultrasound. Second delay was made within the ward when the patient had to wait for 3 hours before she was admitted. Then another 1½ hour before she was scanned. The delay might have been prevented if there was a guideline in case of emergency in the OPD. For example, a nurse could have accompanied the patient to ultrasound and then to the ward, to make sure everything was done quickly and first hand. The problem was that no one was responsible for the patient; hence she was lost in the system. The near-miss woman (case 7) with moderate seizures was another example of prolonged waiting time from enquiry at OPD at 6:00 a.m. and until seen in maternity ward at 10:00 a.m. The poor communication came to show in case 8. The delay in calling the MO was mostly caused by the fact that the observations were made at shift, therefore the nurse didn’t call the MO herself but wrote in the cardex for the next nurse to do so. Probably due to lack of time this was never registered and the foetus died. In case 7, the doctor wrote in the file to monitor the patient ¼ hourly. This never happened due to poor communication and lack of nurses to carry it out. In the future there is need for exact agreements on how information is passed on.

**Lack of staff**

When obstetric emergencies happened within the ward, action was delayed by factors, mostly originating in lack of staff. It influenced the workflows and gave rise to poor monitoring of patients and impaired the quality of the doctor reviews. Very often monitoring was not done properly or was not done at all. Because of this, no one registered the deterioration of a woman’s condition, before late. The woman with the potential amniotic embolism (Case 8) was not monitored from 10:00 p.m. when her condition deteriorated until her death at 1:25 a.m. This is supported by the staff interviews where a nurse said that they only had time to register if a woman was breathing. In this case the consequences were that no doctor was called and no transfer was made to another hospital with an ICU. There are several cases to document the severity of the surveil-
lance problem. In case 7 the woman was left unattended on admission with unacceptably high blood pressure. This evolved into a dangerous lung oedema which almost caused her death.

Since it would be impossible to recruit more staff, there was need for a different organisation among the staff available and maybe a new distribution of responsibilities. One way to deal with an emergency problem is to make sure that at least one of the nurses is held responsible for the critically ill patient. If the patient is labelled as a personal responsibility, it is less possible that the patient is forgotten or overlooked. We do realise there isn’t capacity for doing this with all patients, but the intervention might include only certain risk groups, like case 7, who was admitted in a serious condition. Another way to manage the problem is to give more responsibility to the caretakers of the patients. If they were taught how to use a blood pressure-machine and a thermometer, they could take the necessary vital signs and notify the health staff. The caretakers were relatives who stayed in the hospital to feed and wash the patients. They were available in the hospital; however, ethical or cultural matters might limit this solution.

Lack of educated doctors was a big problem concerning proper diagnosis and treatment plans. Often the interns and medical student were to review the critical ill patient. This degraded and often delayed the proper treatment of the patient. In Case 8 the patient was never reviewed by a senior doctor and died. And in case 5, the patient developed septic shock while the doctors were doing a caesarean section. Therefore only nurses were to handle the delicate situation.

Attitudes towards emergencies

We also found that the doctor’s perception and definition of emergencies were quite different from ours. The patients were not considered as emergencies before they were in a stage of shock or almost dying from PPH. The attitudes of the doctors were of great importance because it affected the nurses and medical students. The doctors sat the pace of the treatment which could only be started with their approval. The comment “TIA, This is Africa”, (box 1), shows an attitude of indifference and adaption to the way things were being done, without hope of improvement.

Case 2 is a good example of how initiatives often were delayed, due to a restrained and conservative opinion among the health workers. In this case the doctor’s opinion was not only delaying the process, but also the nurses’ assessment of the patient. The patient did not receive the correct treatment on admission. And the nurses were slow to inform the doctors of the woman’s deterioration, even though the changes in her condition were vital.

The previously mentioned case 7 also showed great delay in treatment initiatives. From inquiry at the hospital until she was admitted she had to wait 4 hours, and not even on admission was action taken.
She was waiting around the ward until she developed crepitations and this was initially not considered a danger sign by the senior reviewing doctor.

A change in attitude among the health staff is very difficult to implement. If the doctors are not acting prompt, a laid back attitude would will spread among the nurses and medical students making it okay to wait and see. To change the way of perceiving patients and treatment, there is need for more education among the health workers and possible more guidelines on how to handle different emergencies. This would support decisions, and make it easier to hold the staff responsible.

**Maternal death audits**

An initiative at BDH had been made to investigate maternal mortality by doing maternal death audits (MDAs). This was introduced in Busia in 2007 and was an investigation of the causes of and circumstances surrounding maternal deaths which occur in the hospital. It is particularly concerned with tracing the path of the women who died within the facility and to identify any avoidable factors which could be changed to improve maternal care in the future. According to the consultant senior doctor (CSD) this initiative have had a great impact on maternal mortality and had reduced the numbers sustainably.

“Back then it was every week that one person died” (CSD).

Though in spite of good intentions, there is still plenty of room for improvement. The meetings were not always held at the time of death. The cases accumulated and were discussed together half yearly. This made it difficult always to remember details surrounding the patient and complicates the investigations. According to protocol the hospital should also be doing a post mortem to investigate the cause of death. But the relatives seldom gave permission and often the doctors did not ask the relatives.

- Mette Viuff

Different aspects of substandard care have been identified and discussed. In the future more effort must be done to improve reproductive health in developing countries. Mothers die of complications, in pregnancy and giving birth, which could be avoided.

WHO guidelines are still not achieved. According to the millennium development goal 5, WHO wish to reduce the maternal mortality ratio by three quarters between 1990 and 2015. One of the 5 key working areas for reaching these goals is “strengthening health systems and promoting interventions focusing on policies and strategies that work, are pro-poor and cost-effective.”¹⁹ This exact focus area has been our guideline in making suggestions to future interventions at BDH.

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¹ The year was given when interviewing the consultant senior doctor
During our stay at BDH we found that the main reasons for mismanagement of pregnancy related problems leading to maternal mortality were: Lack of facilities, equipment and treatment opportunities, poor organization concerning available medicine, working and treatment procedures, lack of educated personnel and poor communication among the health workers. Some of these might be possible to improve by simple changes that will enhance the outcome of reproductive health and reduce maternal morbidity and mortality at BDH - and maybe other hospitals.

-Mette Viuff og Sofie O. Skriver

Suggestions for future interventions

1) Organise an oxygen treatment room, where the oxygen containers are stationary and patients are brought for treatment. This also promotes a special focus on the critically ill patient, making her less likely to be forgotten.

2) Guidelines for medication and fluid therapy should be available to make treatment standardized and not based on individual assessment.

3) Introduce routines or improve existing so medicine boxes are updated daily. This ensures that boxes are filled and medicine is not expired.

4) Increase the amount of blood in the “blood bank”. One method could be by making campaigns for blood donation in Busia town and at the hospital.

5) Introduce guidelines in OPD making sure that blood for GXM are taken and at least one IV line is secured of all critically ill patients. Especially where the doctors suspect haemorrhage.

6) Attach an OPD nurse to emergency patients. She is the facilitator, making sure all examinations are done and that the patient is followed through his/her admission. Hence isn’t “lost in the system”.

7) Introduce regular EMOC training among the nurses for them to feel confident to handle emergency situations alone, while waiting for a doctor. To limit the training costs the education could be held by nurses with supervision of a senior doctor.

8) Introduce emergency guidelines for every sort of obstetric complication. This will ensure that none of the staff doubt the seriousness of the situation, and knows exactly what needs to be done. This also makes it easier to hold people responsible if everybody knows their exact function.

9) Attach one nurse to critically ill patients in the ward making her responsible for monitoring the patient.

10) Teach the caretakers to monitor vital signs of the patients. This would ease the working pressure of the understaffed nurses.

11) Put one doctor in charge for doing maternal deaths audits and holding the debriefing meetings. Making sure maternal mortality is discussed every month, that staff is held responsible for their decisions and that a post mortem investigation is done whenever in doubt of the cause of death.

-Mette Viuff og Sofie O. Skriver

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- Sofie O. Skriver

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2 www.un.org/millenniumgoals/
