A CASE OF SEPSIS

CATHERINE GREENWOOD - OXFORD

MATERNAL AND MEDICAL HISTORY

- 33 year old woman was in her first pregnancy and was deemed low-risk and therefore booked under midwifery led care at 8 weeks gestation.
- Previous irritable bowel syndrome and had also required treatment with clomiphene citrate to assist conception. There were no other complicating features.
- At her booking visit she was found to have a normal blood pressure and her routine antenatal screening blood tests were within normal limits.

ULTRASOUND SCANS:

- 3 ultrasound scans in the first trimester of pregnancy – these were all documented as normal and an estimated date of delivery of 18th July 2017 was assigned.
- Anomaly scan at 19 weeks and 6 days of pregnancy and a growth scan at 36 weeks exactly – showed a normally progressing pregnancy.

ANTENATAL CARE:

- Appropriate antenatal visits with her midwife continued throughout her pregnancy and the pregnancy progressed normally.

DAY BEFORE GIVING BIRTH 40+5 WEEKS

- 40 weeks and 5 days gestation the woman had contacted the MAU by telephone for advice regarding a watery discharge and possible rupture of membranes..
- 14:54 hours - asked to observe her vaginal lo
- 16:15 hours - asked to come in to the hospital
- 17:08 hours – diagnosis of possible spontaneous rupture of membranes (SROM) within the last hour. Not contracting.

HOSPITAL ASSESSMENT

- 18:00 hours. The findings were all normal –SFH 38 cm, cephalic presentation, 3/5th palpable abdominally and the fetal heart rate was normal at 147bpm). Fetal movements were seen and felt by the woman and the midwife.
- The maternal observations were also normal - temperature: 36.5   C, maternal heart rate: 78 beats per minute, blood pressure: 132/84 mmHg and respiratory rate: 16. A urine dipstix test showed a trace of protein
- speculum examination was performed and clear amniotic fluid was seen draining. The woman's cervix was not yet starting to dilate.
- A high vaginal swab was taken. This swab later grew Group G streptococcus

ADVICE

- Possible options were discussed with the woman and her husband by the midwife, using the Trust patient information leaflet 'When Your Waters Break' (2014) as a basis for this discussion. The information in this leaflet is in line with the relevant NICE guideline *'Intrapartum care for healthy women and babies' [CG190].*
- PIL includes the information that in women presenting with pre-labour rupture of the membranes at term that the risk of serious neonatal infection is 1%.
- The woman was advised to record her temperature every 4 hours (while awake) and to contact the hospital if her temperature rose above 37°C.
- She was also advised that if she had not gone into labour by 15:00 hours on the 24th July 2017 that the recommendation would be to attend for an induction of labour.
- The woman was discharged home to await events after a review and discussion with the midwife on when to call or attend the maternity assessment unit (MAU) and was given a patient information leaflet on SROM. The woman returned home.

24TH JULY 2017 40 WEEKS 6 DAYS

- 02:50 hours
- The woman telephoned the MAU and complained of pain around her umbilicus. She informed the team that she had also started to have regular contractions occurring approximately every 5 minutes, lasting for 30 seconds at a time. She was advised to stay at home.
- 03:20 hours
- The woman telephoned the MAU to inform them that the contractions were now lasting for 60 seconds. She had taken her temperature at home which was 37.2 C. She was advised to take paracetamol and to re-check her temperature an hour after taking the paracetamol.
- 03:25 hours
- The woman's partner telephoned again to inform MAU that the woman's temperature was now 37.8 C. They were asked to come into the MAU.

04:40 HOURS

- The woman arrived at the John Radcliffe Hospital maternity unit. On arrival the patient was contracting every 4 minutes. The maternal observations were:
- Temperature: 38.5°C
- Heart rate: 120 beats per minute
- Respiratory rate 32/ minute
- Blood pressure: 144/82 mmHg
- Initial fetal heart rate 160 beats per minute (borderline increase for a baby at 40 weeks' gestation).
- CTG was commenced.
- The band 6 midwife suspected severe sepsis and informed the other midwife working on MAU.
- A decision was made, by the band 6 midwife providing care, to transfer from the Triage Room to Delivery Suite (DS) to start treatment.

ON DELIVERY SUITE

- **05:06 hours**
- On arrival to DS the CTG monitoring of the baby was immediately recommenced, showing a fetal heart rate of 135 beats per minute. The mother continued to have a very high pulse rate consistent with maternal sepsis.
- **Between 05:06 and 05:12hours**
- The Band 6 midwife went into the staff rest room on DS and informed the obstetric resident on call doctors that were there (a junior (Specialist Trainee ST2) and a senior (ST7) doctor) that there was a woman with severe sepsis on DS.

DS

- **05:12hours**
- Broad spectrum antibiotics (Ceftriaxone, 2g) were prescribed by the ST2 using Electronic Patient Records (EPR). The ST2 did not see the patient because they were called urgently to the gynaecology ward to see another patient.
- **05:20 hours**
- A Band 5 midwife and the same Band 6 midwife remained with the woman. A third obstetric resident on call doctor (ST5) saw the woman . Venous access was difficult because the woman was showing signs of shock but intravenous access was secured. The serum lactate was measured - the result of this was moderately raised Lactate 2.9. This was consistent with a diagnosis of sepsis.

DS – STARTING TREATMENT FOR SEPSIS

- **05:25 hours**
- Intravenous (IV) fluids were started. The ST5 attempted to insert a further IV access for IV antibiotics to be given separately. The second line was successful and the Band 5 midwife left the room to obtain the IV antibiotics.
- The CTG trace deteriorated further but the clinicians in attendance had appropriately prioritised resuscitating the pregnant woman at this stage. However, other clinicians were able to see the CTG trace outside the room and became concerned.
- A Band 7 midwife met the Band 5 midwife as she left the room and advised an urgent birth. She told the Band 5 midwife she would obtain the IV antibiotics. The same Band 7 asked the ST7 obstetric resident on call doctor to attend the room because of the CTG abnormality. In accordance with the Band 7's advice, the Band 5 midwife returned to the room without the antibiotics.

CTG IN DS

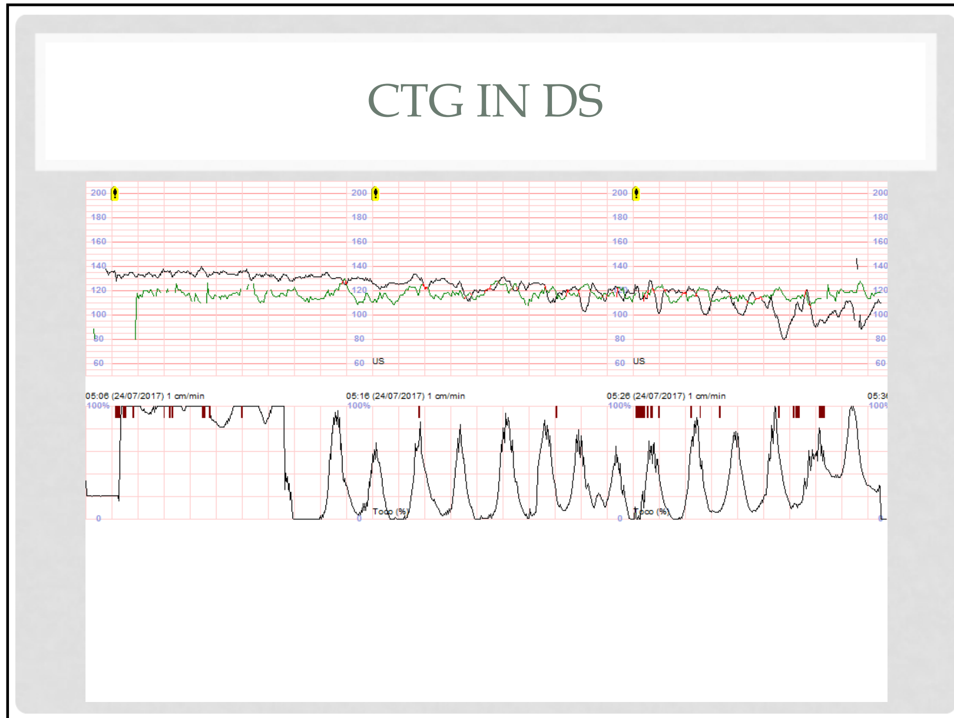
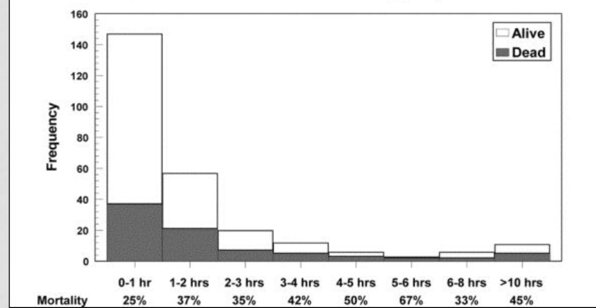


Figure 4.



Impact of time to antibiotics on survival in patients with severe sepsis or septic shock in whom early goal-directed therapy was initiated in the emergency department *.

Gaieski, David; Mikkelsen, Mark; MD, MSCE; Band, Roger; Pines, Jesse; MD, MBA; Massone, Richard; Furia, Frances; Shofer, Frances; Goyal, Munish

Critical Care Medicine. 38(4):1045-1053, April 2010.
DOI: 10.1097/CCM.0b013e3181cc4824

Figure 4. Number of patients and mortality at hourly intervals based upon time from qualification for early goal-directed therapy (EGDT) to appropriate antibiotics.

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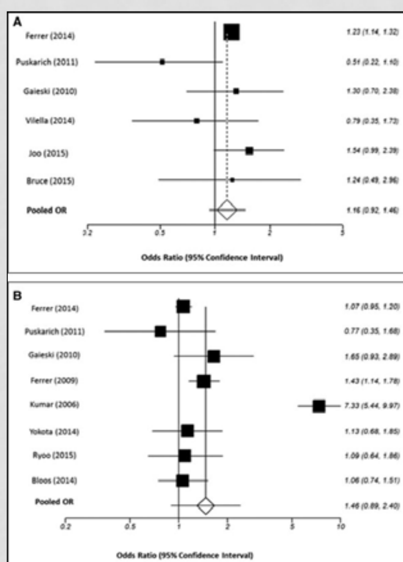
Figure 2



The Impact of Timing of Antibiotics on Outcomes in Severe Sepsis and Septic Shock: A Systematic Review and Meta-Analysis*.
Sterling, Sarah; Miller, W; Pryor, Jason; Puskarich, Michael; Jones, Alan

Critical Care Medicine. 43(9):1907-1915, September 2015.
DOI: 10.1097/CCM.0000000000001142

Figure 2 . Summary of forest plots. A, Pooled odds ratios for mortality and time to antibiotics in less than or more than 3 hr from triage time. B, Pooled odds ratios for mortality and time to antibiotics in less than or more than 1 hr from severe sepsis/shock recognition.

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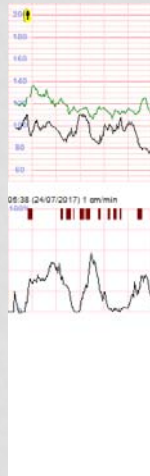
DS

- 05:30 hours
- The ST7 obstetric resident entered the DS room and noted the very abnormal CTG trace. The ST7 performed a vaginal examination to assess progress. The cervix was only 4 cm dilated
- 05:34 hours
- A decision was made by ST7 obstetric resident for a category 1 Caesarean Section because of severe fetal distress. The emergency call was placed; pre-medications were administered. IV antibiotics were not yet given as the Band 5 had returned to the room without the prepared antibiotics and the need to perform a caesarean was perceived to be very urgent.
- Preparation was made to transfer the woman into the operating theatre.
- The duty anaesthetic registrar covering obstetrics was contacted

CTG IN THEATRE



IN THE OPERATING THEATRE

- **05:38 hours**
- The woman was transferred into the delivery suite operating theatre. Preparations were made for a Cat 1 CS
- The woman had been cleaned and draped as required for a caesarean section.
- During this time the Band 7 midwife brought the IV ceftriaxone into the operating room and left them ready to be used but they were not given.

DS THEATRE

- **05:45 hours**
- *Failed Attempt to intubate the woman by Anaesthetist 1*
- The resident anaesthetist from another area of the hospital (West Wing) and the on-call consultant obstetric anaesthetist were both contacted.
- **05:48 hours onwards**
- Anaesthetist 1 performed a second laryngoscopy using the same equipment. The view was not improved and so no further attempt at intubation was made.
- The woman's oxygen saturation was now 94% and therefore no further attempts at intubation were made by Anaesthetist 1 who instead focused on maintaining maternal oxygen saturation.
- An oropharyngeal airway was inserted and bag-valve-mask ventilation failed
- A supraglottic airway device (iGel) was prepared . At this point, before the iGel was inserted, the patient started to breathe spontaneously and so high-flow oxygen was administered via the face mask with the oropharyngeal airway still in place. The woman's oxygen saturations improved, rising to over 90%.

DS THEATRE

- 05:55 hours – 06:01 hours
- At 05:55 hours a second anaesthetist arrived in the Delivery Suite Theatre. The woman still had no secure airway. An Ultrasound Scan (USS) was performed during this time and a fetal heart rate bradycardia was noted with a low fetal heart rate of 40-50 beats per minute.
- 06:01 hours - 06:07 hours
- After discussions between the obstetricians and anaesthetists, a further attempt at intubation should be made by Anaesthetist 2. A successful intubation occurred.
- 06:08 hours – 06:10 hours
- Correct tube position was confirmed on capnography at 06:08 hours.

DS THEATRE

- **06:11 hours**
- The obstetricians than attempted to locate a fetal heart beat using both a Sonicaid and ultrasound scan unfortunately there was no fetal heart activity and sadly the baby had died. The diagnosis of intrauterine death was confirmed by both Obstetric Registrars.
- Antibiotics for sepsis were given at 0615