

# Obstetric Medicine

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Or.....

“Everything you need to know before you go  
and see a patient on the labour / antenatal  
ward”

# Medical Problems in Pregnancy

## Pre-existing

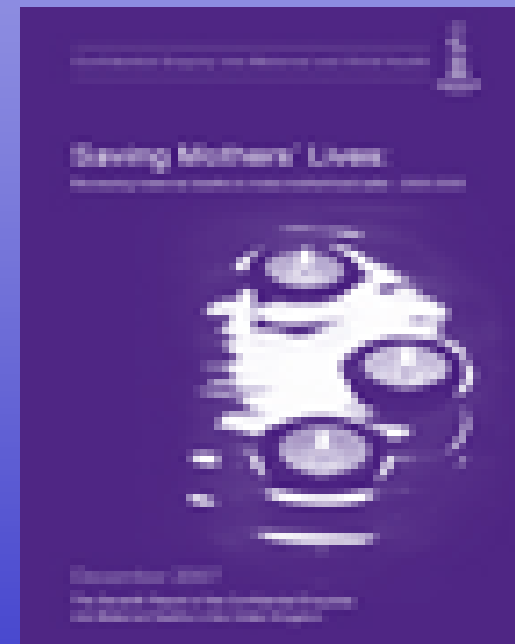
- Asthma
- Epilepsy
- Hypertension
- Diabetes
- Thyroid
- SLE / RA
- Renal
- Cardiac

## Pregnancy - specific

- Pre-eclampsia
- (Thromboembolism)
- Gestational Diabetes
- Obstetric cholestasis
- Hyperemesis
- Acute Fatty Liver Pregnancy

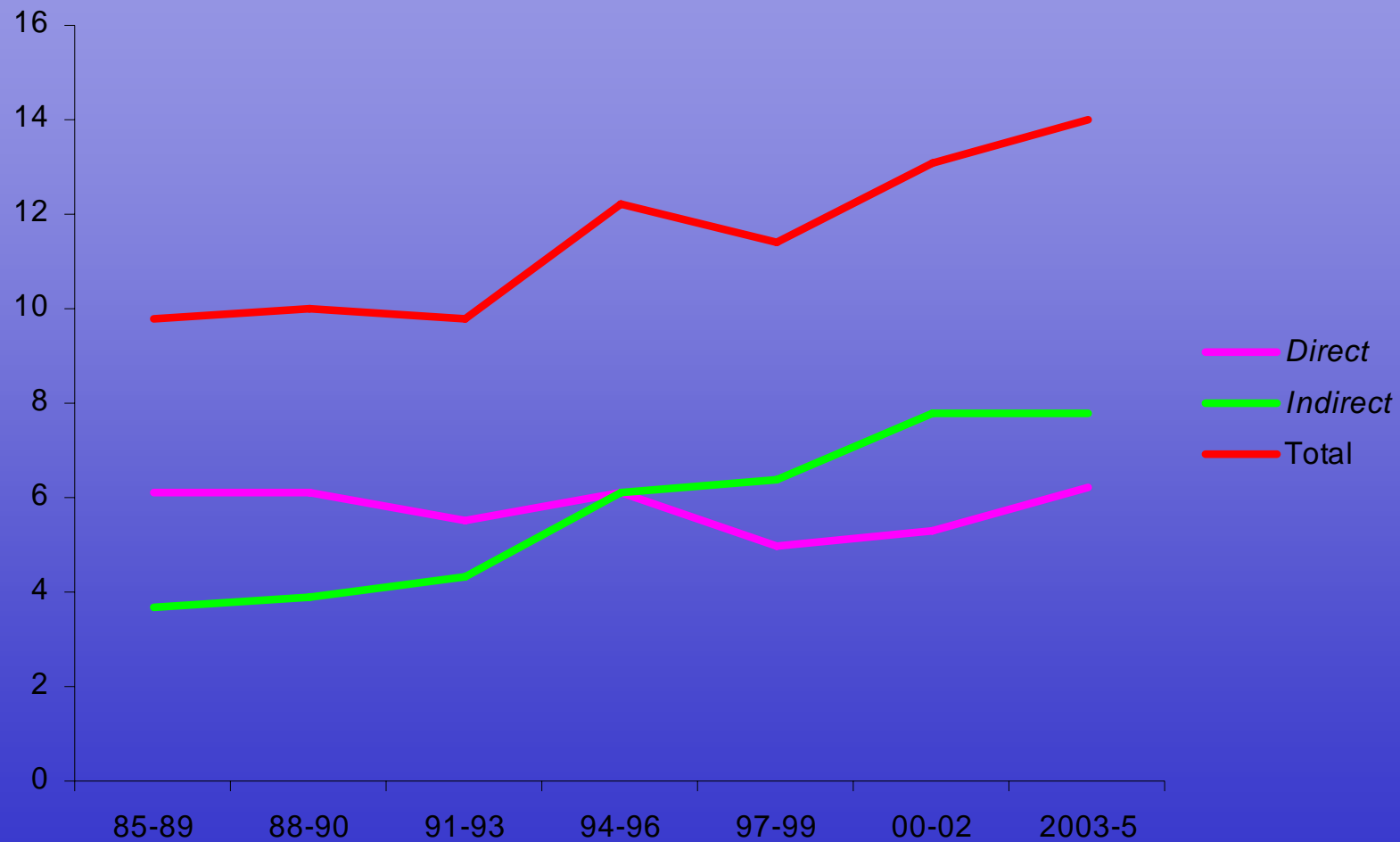
# Saving Mothers' Lives

<http://www.cemach.org.uk/>

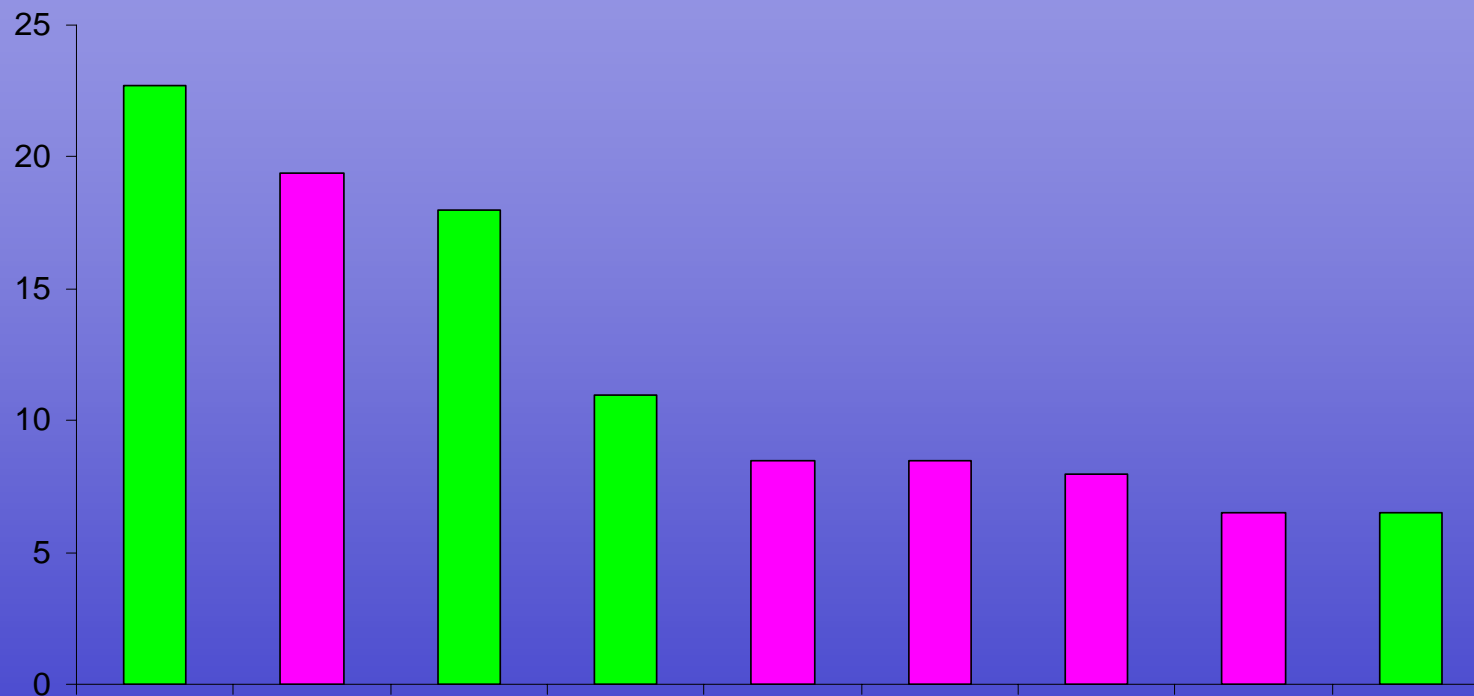


The Seventh Report of the United Kingdom Confidential Enquiries into  
Maternal Deaths

# *Direct and Indirect* maternal death rates UK, 1985-2005



# Overall death rates per million maternities, UK, 2003-05



# Things you need to know...

- Midwives are not nurses and detest being referred to as such
- Obstetricians know a lot about pre-eclampsia
- Obstetricians are surgeons and don't know a lot about medicine
  
- Don't be afraid of the patient or her bump

# Common problems

- Abnormal blood tests
- Drug safety
- Clinical scenarios
  - Short of breath
  - Palpitations/chest pain...funny ECG
  - Funny neurology

# Case 1: Abnormal blood tests

Which of the following are abnormal in a 23 year old primip, 34 week pregnant woman?

- Hb 10.4 g/dl [12-14]
- ESR 36 [0-10]
- CRP 25 [0-7]
- Urea 6.4 mmol/l [2.5-6.7]
- Creatinine 93  $\mu\text{mol/l}$  [60-120]
- ALT 48 IU/L [5-55]
- Uric acid 0.39 [0.18-0.42]
- pH 7.46 [7.35-7.45]
- $\text{HCO}_3^-$  18mEq/L [21-28]

# Case 1

- What other things do you want to know?
- BP 150/100
- Urine dip: 2+ protein (PCR 40)
- Baby – well grown

- What is the diagnosis?
- **PRE-ECLAMPSIA**

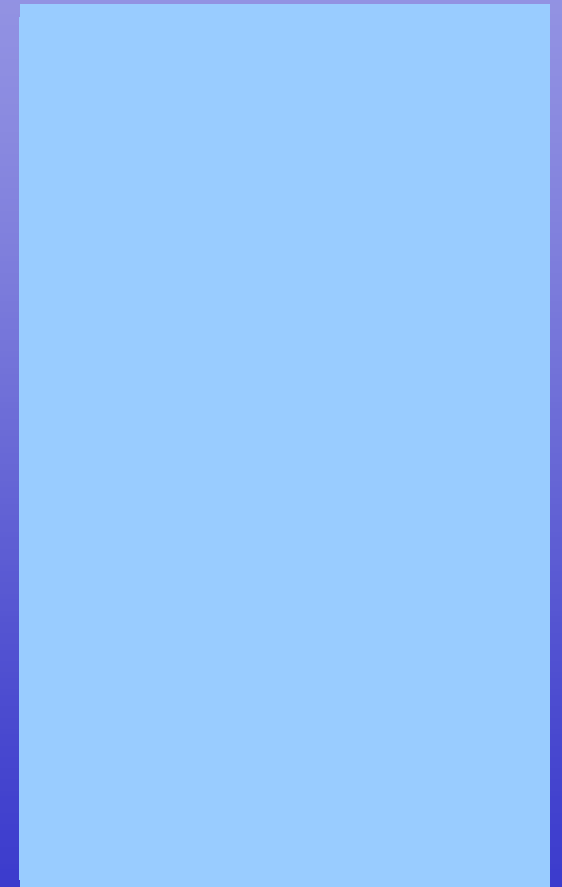
- Affects 5% of pregnant women
- Disorder of placental insufficiency
  - Maternal syndrome
  - Fetal Syndrome
- Diagnosis
  - BP 140/90 on 2 readings 4 hrs apart
  - 300 mg proteinuria in 24 hrs

# Normal Pregnancy – Circulatory adaptation

↑ Stroke Volume  
↑ Heart Rate 10-20 b.p.m. } ↑ Cardiac Output ~40%

↑ Blood Volume ~50%

↓ Systemic & Pulmonary  
↓ vascular resistance (20-30%)



# Normal Pregnancy – Respiratory adaptation

↑ Oxygen consumption

↑ Metabolic Rate

↑ Tidal Vol.

Resp rate



↑ Resting minute ventilation (40-50%)

VC, FEV1, PEFr

↓ Functional residual capacity



# Normal Pregnancy – Renal adaptation

Physiological

Hydronephrosis/Hydroureter

(AP diameter <2cm – normal)

↑ Renal Blood Flow (70-80%)

↑ GFR (50%)

Protein Excretion

Changes to tubular function

Acid-base regulation

Osmoregulation

↑ UTI's/pyelonephritis

↓ Cr (40-70 $\mu$ mol/L)

↓ Ur (< 5mmol/L)

↑ Proteinuria (<300mg/24hrs)

↑ Glycosuria

↑ Aminoaciduria

↓ Uric Acid

↓ HCO<sub>3</sub> (18-22mEq/L)

↓ Plasma osmolality  
(~10mOsm/kg H<sub>2</sub>O)

# Case 2

- You are called to the gynaecology ward to review a 28 year old woman who is 8 weeks pregnant. She gives a 3 week history of severe nausea and vomiting, and weight loss.
- On examination she is tachycardic 110, BP 94/68, ketotic (3+).
- What is the Diagnosis?
- Bloods
  - K = 3.1, U = 2.3, Cr = 56
  - ALT 53, AST 49
  - Free T4 = 37, TSH < 0.1

You would prescribe: (pick one)

- A. IV Hartmanns, cyclizine, PTU
- B. IV Saline + K, metoclopramide, PTU
- C. IV Saline + K, prochlorperazine, carbimazole
- D. IV Saline + K, cyclizine
- E. IV Hartmanns, carbimazole

# Biochemical thyrotoxicosis of hyperemesis gravidarum

- Suppressed TSH
- High  $fT_4$  &  $fT_3$
- Correlates with severity of hyperemesis

*Goodwin et al. AJOG 1992; 167: 648*

- Abnormal TFTs in 60% with HG
- Correlates with hCG – same  $\alpha$  subunit

*Goodwin et al. J Clin End Metab 1992; 75: 1333*

# Biochemical thyrotoxicosis of hyperemesis gravidarum

- Search for pointers to true hyperthyroidism
  - Hx preceding pregnancy
  - Eye signs
  - Goitre
  - TSH receptor Abs
- Does not require antithyroid drug treatment
- Resolves with treatment of hyperemesis

# Abnormal LFTs

- In up to 25% of in patients
- Moderate rise in transaminases (<200 u)
- Bilirubin slightly raised
- Jaundice rare
- Marker of severe hyperemesis gravidarum
  - Case reports of liver failure

# Liver disease in pregnancy

## Due to pregnancy

- Hyperemesis
- Obstetric Cholestasis
- Pre-eclampsia
- HELLP syndrome
- Acute Fatty Liver of Pregnancy

## Incidental to pregnancy

- Viral Hepatitis
- Drug hepatotoxicity
- (Cholelithiasis)
- Exacerbation of CAH, PBC, sclerosing cholangitis

Abnormal LFTs in pregnancy – remember  
NASH, sepsis, drugs (methyl dopa)

# DRUGS IN PREGNANCY

- Drugs used to treat asthma
- Anticonvulsants
- Antithyroid drugs
- Hypoglycaemics and insulin
- Anticoagulants
- Antihypertensives
- Analgesics and anti inflammatory
- Antibiotics
- Antiemetics
- Drugs for psychiatric disorders

# Drugs – risk/benefit analysis

## YES - OK

- Cyclosporin
- Tacrolimus
- Azathioprine
- Prednisolone
- Penicillins
- Cephalosporins
- Gentamycin
- $\alpha$  blockers
- Ca antagonists

## NO

- NSAIDs
- Mycophenolate mofetil
- Rapamycin
- Tetracycline
- ACE Inhibitors  
(oligohydramnios/renal dysplasia/pulmonary hypoplasia/cardiac)
- AT II receptor blockers
- Cyclophosphamide
- Statins
- ( $\beta$  blockers)
- (diuretics)

# ACE inhibitors and pregnancy

*Cooper et al NEJM 2006; 354: 2443.*

- ◆ Infants with only first-trimester exposure to ACE inhibitors had an increased risk of major congenital malformations
- ◆ risk ratio, 2.71; 95 % CI, 1.72 to 4.27
  - ◆ cardiovascular system; RR, 3.72; 95 % CI, 1.89 to 7.30
  - ◆ central nervous system; RR, 4.39; 95 % CI, 1.37 to 14.02.

# Case 3

- 33 year old multip, 36 weeks
- A + E: SOB and coughing for 5 days
- Asthma since childhood
  - Salbutamol and beclomethasone inhaler
  - Not taken beclomethasone inhaler since pregnant
  - GP prescribed beclomethasone and amoxicillin 2 days ago
- Uneventful antenatal course
- O/E: HR = 120, BP = 112/74
- RR = 30, PEFr = 120 (30% predicted after 5mg nebulized salbutamol)

## Case 3 – the following is/are true:

- A. Back to back nebs may precipitate labour
- B. Atrovent is contraindicated
- C. Oral prednisolone is preferable to IV hydrocortisone
- D. CXR should be withheld
- E. Mg SO<sub>4</sub> is safe in pregnancy

# Acute asthma

*Cydulka et al. Am J Resp Crit Care Med 1999;160:887-892*

- 51 pregnant, 500 non-pregnant presenting to A&E with acute asthma.
- No difference in severity or duration of symptoms, initial PEFr (51% vs 53% predicted)
- Less likely to be given systemic steroids (44% vs 66%)
- Equally likely to be admitted (24% vs 21%)
- Steroids if sent home (38% vs 64%)
- x3 Ongoing exacerbation 2weeks later

# Asthma medication in pregnancy

*Enriquez et al AJOG 2006; 195:149-53*

- Tennessee, 1995-2001
- Women with asthma decrease medication use from 5-13 weeks
- 23% reduction in inhaled corticosteroids
- 13% reduction in short-acting beta<sub>2</sub> agonists
- 54% reduction in rescue steroids

# BTS /SIGN Asthma Guidelines 2009 Drug Therapy in pregnancy

- B Use short acting beta 2 agonists as normal
- C Use long acting beta 2 agonists as normal
- C Use inhaled steroids as normal
- C Use oral and intravenous theophyllines as normal
- C Use steroid tablets as normal when indicated for severe asthma. Steroid tablets should never be withheld because of pregnancy
- D Leukotriene antagonists may be continued in women who have demonstrated, prior to pregnancy, significant improvement not achievable with other medications

# Case 4

- 39 yr old multip, 12 weeks, 76kg
- Secondary infertility; IVF pregnancy
- Admission for ovarian hyperstimulation syndrome
- A+E: C/O swollen, painful left leg for 3 weeks
- Sudden onset left sided pleuritic pain last night
- SOB since
- O/E dyspnoeic, RR 34, SOB/OE undressing
- Pulse 118, BP 104/66
- Oxygen saturation 92%

## Case 4: Which of the following is/are appropriate?

- A. D dimers
- B. leg dopplers
- C. Enoxaparin 80mg bd
- D. Enoxaparin 120mg od
- E. V/Q
- F. CTPA

# Diagnosis of DVT in Pregnancy

- 85% on left (vs. 55% in non pregnant)
- 72% ilio-femoral (vs. 9% in non pregnant)

*Greer IA. Lancet 1999; 353:1258-65*

# Diagnosis

- DVT
  - Doppler US
- PE
  - CXR
  - V/Q Lung scan if normal CXR, no Hx asthma
  - CTPA if other pathology suspected/abnormal CXR, known asthmatic

**D dimers are useless!!**

# Radiation exposure

- CXR - negligible
- V/Q versus CTPA

Imaging technique	Advantages	Disadvantages
V/Q scan	<ul style="list-style-type: none"><li>• High negative predictive value.</li><li>• High sensitivity for small peripheral PE</li></ul>	Higher radiation dose to fetus - but still small. (estimate of risk of fatal childhood cancer 1/280000 following in utero V/Q versus 1/1000000 following in utero CTPA) <sup>1</sup>
CTPA	<ul style="list-style-type: none"><li>• Lower radiation dose to fetus (&lt;10% than with V/Q scanning)</li><li>• Better at identifying other pathology (e.g. aortic dissection)</li></ul>	High radiation dose to maternal breast tissue which is associated with an increased (by 13.6%) life-time risk of breast cancer (background risk 1/200) <sup>2</sup> .

(1) Cook JV, Kyriou J. BMJ. 2005;331:350. (2) Remy-Jardin M, Remy J. Radiology. 1999;212:615-36.

# Treatment: Dose of LMWH

- High (Thrombosis in current pregnancy, Metal cardiac valve) Enoxaparin 1mg/kg/bd;  
Daltaparin 120U/kg/bd

**NOT 1.5 mg/kg od (= non-pregnant dose)**

**Measure anti factor Xa levels 4 hrs post dose**

- Low - prophylaxis Enoxaparin 40 mg  
od/Daltaparin 5000U od

# Case 5

- 24 yr old primip, 12 weeks
- Eisenmenger's syndrome and VSD
- No follow-up since age 16
- COCP
- Unplanned pregnancy (antibiotics)
- O/E cyanosed, SOB/OE undressing
- Pulse 82, BP 126/76

# Case 5: You would advise

- A. Termination of pregnancy
- B. Sildenafil and bosantan
- C. Inhaled nitric oxide
- D. PA prostacyclin
- E. Heart lung transplant

# Pulmonary hypertension

- Danger relates to fixed pulmonary vascular resistance
- Inability to increase pulmonary blood flow with refractory hypoxaemia
- Most deaths can be attributed to
  - thromboembolism
  - hypovolaemia
  - pre-eclampsia.

# Pulmonary hypertension

- **Maternal mortality**

- 30-50% (*Yentis et al. BJOG 1998; 105: 921-922*)

- 25% (*Bedard et al Eur HJ 2009; 30: 256-65*)

- **Better education of health care professionals**

- **Non alienating pre-pregnancy counselling**

- **Avoidance of pregnancy**

- **Adequate contraception**

- **Or termination**

# Case 6

- 38 year old primip, 39 weeks pregnant
- C/o chest and back pain
- O/e BP 165/85, HR 124, O<sub>2</sub> sats 97%
- Urinalysis NAD
- ‘Writhing around the bed’, ‘won’t lie down to be examined’
- Not in labour!

# Case 6: What investigations would you request?

- A. CXR
- B. back XR
- C. TTE
- D. TOE
- E. abdo US
- F. CTPA

What is the diagnosis?

- Not all chest pain and breathlessness = PE
- Beware the hypertensive (systolic) woman with chest pain
- CXR
- Echo

## Case 7:

- 42 yr old Asian, 37 weeks pregnant
- c/o dizziness and epigastric pain
- o/e sweaty, BP 94/68, HR 84

# Case 7: which of the following are appropriate?

- A. ECG!
- B. Aspirin
- C. Clopidogrel
- D. Troponin
- E. Thrombolysis
- F. Transfer to catheter lab for primary angioplasty

# Thrombolysis for massive life threatening PTE with haemodynamic compromise

- 172 reports of thrombolytic therapy in pregnancy (Ahearn et al 2002)
  - 164 with streptokinase
  - 3 with urokinase
  - 5 with rtPA.
- 2.9% non-fatal bleeds / No maternal deaths / no reports of intracranial bleeding
  - Similar rate to non-pregnant
  - 1.7% fetal deaths

# Thrombolysis with rt-PA

Leonhardt G et al. *J Thromb Thrombolysis*. 2006;21:271-6.

- ◆ 28 cases reported
  - stroke (n = 10)
  - thrombosis of cardiac valve prosthesis (n = 7)
  - PTE (n = 7)
  - DVT (n = 3)
  - MI (n = 1)
- ◆ 2 patients died (7%)
- ◆ 3 suffered from complications that were managed conservatively (11%)
- ◆ 3 thrombolysis was not successful
- ◆ Thrombolysis complication rates were similar compared to non-pregnant patients

# Myocardial Infarction / ACS

- Maternal death rate is 20%
- Aetiology more likely to be non-atherosclerotic coronary artery thrombosis / dissection
- Intravenous and intracoronary thrombolysis, percutaneous transluminal coronary angioplasty (PTCA) and stents safe
- Aspirin and clopidogrel safe
- Use LMWH / Beta blockers as usual
- Avoid glycoprotein IIb /IIIa receptor inhibitors / statins

# Case 8

- 39 year old, seen in antenatal clinic, Para 2
- Essential hypertension
- 8/40 headache and worsening hypertension
- Rx analgesia, increased methyldopa
- 10/40 headache severe, worse on bending
- 2 episodes of numbness right hand - 15 mins
- Fundoscopy papilloedema

# Case 8: What investigations would you do?

- A. CT
- B. MRI
- C. MRV
- D. PET scan
- E. LP

What is the diagnosis?

# Case 9

- 32 year old Afro-Caribbean lady (Para 2) presents to A&E 9 days post normal vaginal delivery
- 3/7 history of worsening headache and N&V
- In A&E – BP 155/105
- In CT scanner – seizure, spontaneously terminated
- Not febrile

What is the diagnosis?

# Differential diagnosis of seizures in pregnancy

- Eclampsia
- Epilepsy
- Cerebral venous thrombosis
- CVA / ICH / SAH / SOL
- Thrombotic Thrombocytopenic Purpura
- Meningitis/Encephalitis
- Drug / ETOH withdrawal
- Hypoglycaemia / hypercalcaemia

# Seizures in Pregnancy

- A first seizure in pregnancy that cannot readily be attributed to eclampsia or epilepsy warrants investigation with CT or MRI scan of brain.



# Resuscitation: Remember – ABC**W**D

- AIRWAY
- BREATHING
- CIRCULATION
- **WEDGE** (25% increase in CO)
- DELIVER

# Case 10

- 34 year old primip
- 36 weeks pregnant - twins
- Inpatient due to pre-eclampsia (not clinically severe)
- Due for elective caesarean section tomorrow
- Collapses in toilet
- No pulse
- Arrest call
- On arrival – blood everywhere (bleeding from nose, mouth, iv lines) asystolic arrest

# Case 10

- Who do you need?
  - Resus team
  - Obstetricians
  - Paediatricians
  - Haematology on the phone
  - Porters to collect blood
  - ITU
  - Senior support

# Perimortem caesarean section

Perimortem caesarean section is part of the resuscitation procedure in any women who arrests in the second half of pregnancy. It should be undertaken to facilitate maternal resuscitation within 5 minutes of the arrest if there is no initial response to advance life support in the tilted position.

# Important messages

- Cardiac Disease followed by VTE are the leading cause of maternal death in UK
- CXRs / VQ scans / CTPA / MRIs are safe
- The dose of LMWH is larger (= ACS dose)
- Steroids are safe
- Most drugs are safe
- If in doubt re a drug / investigation / blood test – ask the obstetrician

# Medical Emergencies in Pregnancy

- The mother must take priority over the baby
- Turn the mother on her side
- Call the obstetrician
- Don't withhold crucial investigations or life-saving treatments
- Trust your medical instincts
- Work in multidisciplinary teams – physicians; obstetricians; obstetric anaesthetists; midwives