The Acute Physician’s Approach to the Pregnant Patient

Anita Banerjee
Acute Physician
Obstetric Physician
What we need to know?

• Which physiological adaptations occur during pregnancy

• Women with pre-existing chronic conditions may worsen

• Which investigations are safe in pregnancy

• Which drugs are safe in pregnancy
Direct and Indirect Maternal Death Rates UK 1985-2008

The Eighth Report of the UK Confidential Enquiries into Maternal Deaths
Leading Causes of Maternal Deaths 2006-08 UK

MEDICAL PROBLEMS IN PREGNANCY
Women were more obese

- Cardiac disease
- Other Indirect causes
- Indirect neurological conditions
- Sepsis
- Pre-eclampsia
- Thrombosis and thromboembolism
- Amniotic fluid embolism
- Psychiatric causes
- Early pregnancy deaths
- Haemorrhage
- Anaesthesia
- Other Direct causes
- Indirect malignancies

Rate per 100,000 maternities
Medical Emergencies in Pregnancy

Pre-existing
- Asthma exacerbation
- Hypertension
- Diabetes, Thyroid
- SLE, RA
- AKI
- Cardiac arrest
- Heart failure
- Aortic dissection

Pregnancy-specific
- Pre-eclampsia
- Venous thromboembolism
- Gestational Diabetes
- Obstetric Cholestasis
- Hyperemesis
- Acute Fatty Liver
What changes occur during pregnancy?

Haematological  
Cardiovascular  
Renal  
Metabolism  
Respiratory  
Neuromuscular
What changes occur during pregnancy?

Maternal Intravascular Volume Changes

Maternal Respiratory Changes

Maternal Cardiovascular Changes
Case

32 years
Primigravid
27/40 gestation singleton

c/o Breathless
HR 108 beats/min
Sats 94% RA
BP 102/66 mmHg

Past Medical History
Asthma

What tests would you like to do?
Case

32 years
Primigravid
27/40 gestation singleton

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HR 108 beats/min
Sats 94% RA
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Past Medical History
Asthma

Arterial Blood Gas

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.31</td>
</tr>
<tr>
<td>$\text{PCO}_2$</td>
<td>4.1</td>
</tr>
<tr>
<td>$\text{PO}_2$</td>
<td>9</td>
</tr>
<tr>
<td>$\text{HCO}_3^-$</td>
<td>14</td>
</tr>
<tr>
<td>BE</td>
<td>-5</td>
</tr>
</tbody>
</table>

Peak Flow 210
Case

32 years
Primigravid
27/40 gestation singleton

c/o Breathless
HR 108 beats/min
Sats 94% RA
BP 102/66 mmHg

Past Medical History
Asthma

Arterial Blood Gas

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.31</td>
<td>7.40-7.47</td>
</tr>
<tr>
<td>PCO₂</td>
<td>4.1</td>
<td>3.38</td>
</tr>
<tr>
<td>P0₂</td>
<td>9</td>
<td>13.5</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>14</td>
<td>18-22</td>
</tr>
<tr>
<td>BE</td>
<td>-5</td>
<td>0</td>
</tr>
</tbody>
</table>

Peak Flow 210

PEAK FLOW DOES NOT CHANGE
## BTS /SIGN Asthma Guidelines Drug Therapy in Pregnancy

### ASTHMA IN PREGNANCY

Several physiological changes occur during pregnancy which could worsen or improve asthma. Pregnancy can affect the course of asthma and asthma can affect pregnancy outcomes.

- **Women with asthma** should be advised of the importance of good control of their asthma during pregnancy to avoid problems for both mother and baby.
- **Monitor pregnant women** with moderate/severe asthma closely to keep their asthma well controlled.
- **Advise women who smoke** about the dangers for themselves and their babies and give appropriate support to stop smoking.

### DRUG THERAPY IN PREGNANCY

- **Steroids are safe**
- **Bronchodilators are safe**
- **Magnesium sulphate safe**

### Poor asthma control:
- **Perinatal mortality**
- **Low birth weight**
- **Preterm delivery**

### MANAGEMENT DURING LABOUR

- **If anaesthesia is required**, regional blockade is preferable to general anaesthesia.
- **Use prostaglandin F2α** with extreme caution because of the risk of inducing bronchoconstriction.
- **Advise women**:
  - that acute asthma is rare in labour
  - to continue their usual asthma medications in labour
  - Women receiving steroid tablets at a dose exceeding prednisolone 7.5 mg per day for > 2 weeks prior to delivery should receive parenteral hydrocortisone 100 mg 6-8 hourly during labour
  - In the absence of acute severe asthma, reserve caesarean section for the usual obstetric indications.

### DRUG THERAPY IN BREASTFEEDING MOTHERS

- **Encourage women** with asthma to breastfeed
- **Use asthma medications as normal during lactation.**
Are we reluctant to treat asthma?

Two studies 10 years apart show:

- Pregnant women under-treated with systemic corticosteroids both in the A&E compared to non-pregnant
  - 41% compared to non-pregnant 69.2% (p<0.001)
- Pregnant women are 3-4 times more likely than non-pregnant to return to the A&E within two weeks for recurrent or on-going asthma symptoms

*If symptoms do worsen, most likely in 2nd & 3rd trimesters*

*Peak in the sixth month*

Cyduka et al 1999
McCallister et al 2011
Are steroids safe in pregnancy?

• Prednisolone effectively metabolised by the placenta
  • Only 10% reaches fetus

• Increased excess risk 0.2-0.3% for isolated cleft lip/palate

Risk/benefit—in favour of the use of oral steroids

## Effects of Maternal Hypoxia

<table>
<thead>
<tr>
<th>Maternal Oxygen Saturation (%)</th>
<th>Live birth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;90</td>
<td>92</td>
</tr>
<tr>
<td>&gt;85-90</td>
<td>63</td>
</tr>
<tr>
<td>&gt;85</td>
<td>12</td>
</tr>
</tbody>
</table>
Case

27 years
Primigravid
22/40 gestation
singleton

c/o Cough and Sweats

- HR 112 beats/min
- Sats 91% RA
- BP 102/74
- 38 °C CRP 124
Case

27 years
Primigravid
22/40 gestation
singleton

c/o Cough and Sweats
- HR 112 beats/min
- Sats 91% RA
- BP 102/74
- T 38°C
- CRP 124

CRP does not change during pregnancy
What antibiotics would you prescribe?

A. Amoxycillin and doxycycline
B. Amoxycillin and erythromycin
C. Augmentin and doxycycline
D. Cefuroxime
E. Amoxycillin and clarithromycin
What antibiotics would you prescribe?

A. Amoxycillin and doxycycline
B. Amoxycillin and erythromycin
C. Augmentin and doxycycline
D. Cefuroxime
E. Amoxycillin and clarithromycin
Case

34 years
Primigravid
32/40 gestation singleton

Palpitations for the past 3 hours in A&E

• HR 140 beats/min
• Sats 99% RA
• BP 112/74 mmHg
Case

34 years
Primigravid
32/40 gestation singleton

Palpitations for the past 3 hours in A&E

- HR 140 beats/min
- Sats 99% RA
- BP 112/74 mmHg

Heart Rate in pregnancy
110 beats/min
ECG
Supra Ventricular Tachycardia

1. Vagotonic manoeuvres are safe
2. Adenosine – safe
3. Verapamil is effective second line therapy
   - Up to 10mg can be given without affecting foetal heart rate
Case

- 34 years
- Multiparous
- 33/40 gestation

Worse chest pain ever through the chest

HR 101 beats/min
Sats 99% RA
BP 172/94 mmHg

What test would you like to do?
CT Aortogram
Aortic Dissection

Immediate Management

- Large Bore IV access
- Blood Pressure control
  - IV labetalol OR hydralazine
- Pain relief
  - IV diamorph & anti-emetic

Risk factors

- Shear stress
- Hormone driven vasculopathy
- Marfan syndrome/Ehlers Danlos type IV syndrome
- Hypertension
- Bicuspid aortic valves
- Coarctation of the aorta
Myocardial infarction and pregnancy

A woman who smoked presented to the A&E with chest pain and breathlessness some weeks after delivery.

**Acute coronary syndrome was not considered in the differential diagnosis, possibly in view of a normal ECG, her age and the quality of the pain.**

Serial ECGs and Troponin were not requested, and, even though the working diagnosis was pulmonary embolus, a V/Q scan was not performed.

She was discharged and died shortly afterwards……..
# Myocardial infarction and pregnancy

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortality rate</strong></td>
<td>5.1-11%</td>
</tr>
<tr>
<td><strong>Incidence of MI in pregnancy</strong></td>
<td>Increased in the last decade</td>
</tr>
<tr>
<td><strong>Risk of MI in pregnancy</strong></td>
<td>Increases by 3-4 fold</td>
</tr>
</tbody>
</table>

*Troponin can be measured in pregnancy*
What is the safe radiation exposure during pregnancy?

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Rads</th>
<th>mGy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXR</td>
<td>&lt;0.001</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Perfusion Scan</td>
<td>&lt;0.08</td>
<td>&lt;0.8</td>
</tr>
<tr>
<td>Ventilation Scan</td>
<td>&lt;0.01</td>
<td>&lt;0.13</td>
</tr>
<tr>
<td>CTPA</td>
<td>&lt;0.013</td>
<td>&lt;0.13</td>
</tr>
<tr>
<td>CT head</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>MRI</td>
<td>NO RADIATION</td>
<td>usually avoided in the first trimester</td>
</tr>
<tr>
<td>Max Recommended</td>
<td>&lt;0.5</td>
<td>5</td>
</tr>
</tbody>
</table>
How will the radiation affect my unborn child?

<table>
<thead>
<tr>
<th>Imaging</th>
<th>Fetal Dose (mGy)</th>
<th>Risk of Childhood Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXR</td>
<td>0.01</td>
<td>&lt; 1 in $10^6$</td>
</tr>
<tr>
<td>CTPA</td>
<td>0.01-0.1</td>
<td>1 in a 1,000,000-1 in a 100,000</td>
</tr>
<tr>
<td>Abdo Xray CT Chest</td>
<td>0.1-1.0</td>
<td>1 in 100,000-1 in 10,000</td>
</tr>
<tr>
<td>CT Abdomen Lumber Spine</td>
<td>1.0-10</td>
<td>1 in 10,000-1 in 1,000</td>
</tr>
</tbody>
</table>

IRCP, Hart et al 2007, ARSAC 2006
Medications in pregnancy

Most drugs do not have a licence for use in pregnancy
## Medications in pregnancy

<table>
<thead>
<tr>
<th>Safe in Antenatal Period</th>
<th>Contraindicated in Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prednisolone</td>
<td>NSAIDs</td>
</tr>
<tr>
<td></td>
<td>(1st, 2nd trimester OK)</td>
</tr>
<tr>
<td>Beta blockers</td>
<td>Statins</td>
</tr>
<tr>
<td>Anti-emetics PPIs</td>
<td>Mycophenolate mofetil</td>
</tr>
<tr>
<td>Antihistamines e.g. loratidine</td>
<td>ACE inhibitors</td>
</tr>
<tr>
<td>Cyclosporin Tacrolimus</td>
<td>Cyclophosphamide (1st trimester)</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>Tetracycline</td>
</tr>
<tr>
<td>Penicillins Cephalosporins</td>
<td>Gentamicin</td>
</tr>
</tbody>
</table>

Note: The table does not cover all medications available during pregnancy. Consult a healthcare professional for specific advice.
Maternal Cardiac Arrest: Remember

- AIRWAY
- BREATHING
- CIRCULATION

- Displace the uterus manually to the left

FIVE MINUTE RULE DELIVER
Summary

- Medical problems in pregnancy are common
- Treat the acute problem
- Ask for help – MULTIDISCIPLINARY TEAM
- Easier to provide counselling for complicated medical problems before rather than during pregnancy

If it can happen outside of pregnancy it can happen inside pregnancy………..
Thank you for listening

Any questions?
UK sources of PPC information

**DIABETES**
Advice leaflet for primary care
Accessible on [www.CMACE.org.uk](http://www.CMACE.org.uk)
‘Diabetes in Pregnancy’

**EPILEPSY**
Advice for healthcare professional accessible [www.nice.org.uk](http://www.nice.org.uk):
‘Epilepsy GC020’ – [www.epilepsy.org.uk](http://www.epilepsy.org.uk)

**ASTHMA**
Advice for healthcare professionals
British Thoracic Society – ‘Asthma in Pregnancy’
[www.asthma.org.uk](http://www.asthma.org.uk)

**HYPERTENSION** –
Advice for healthcare professionals
[www.nice.org.uk](http://www.nice.org.uk) –
‘Hypertension in Pregnancy CG107’

**RGOG guidance**