Abdominal Pain in Pregnancy

Salem Abu Mahfouz
Mais Al Shayeb
Sara Mrshed
Roa' Abu Faris
Mohammad Al Damen

Contents

1. General Approach
2. Physiological Changes in Pregnancy
3. Diagnostic Evaluation
4. Obstetric Causes of Abdominal Pain
5. Non-Obstetric Causes of Abdominal Pain
6. Role of Caesarean Section in Abdominal Pain
7. Role of Laparoscopy in Abdominal Pain

General Approach

Salem Abu Mahfouz

- Goal is to identify those in need of urgent intervention
- Signs & Symptoms that possibly suggest a serious cause
  - Moderate – Severe abdominal or pelvic pain
  - Vaginal Bleeding
  - New onset hypertension
  - Hypotension
  - Vomiting
  - Fever

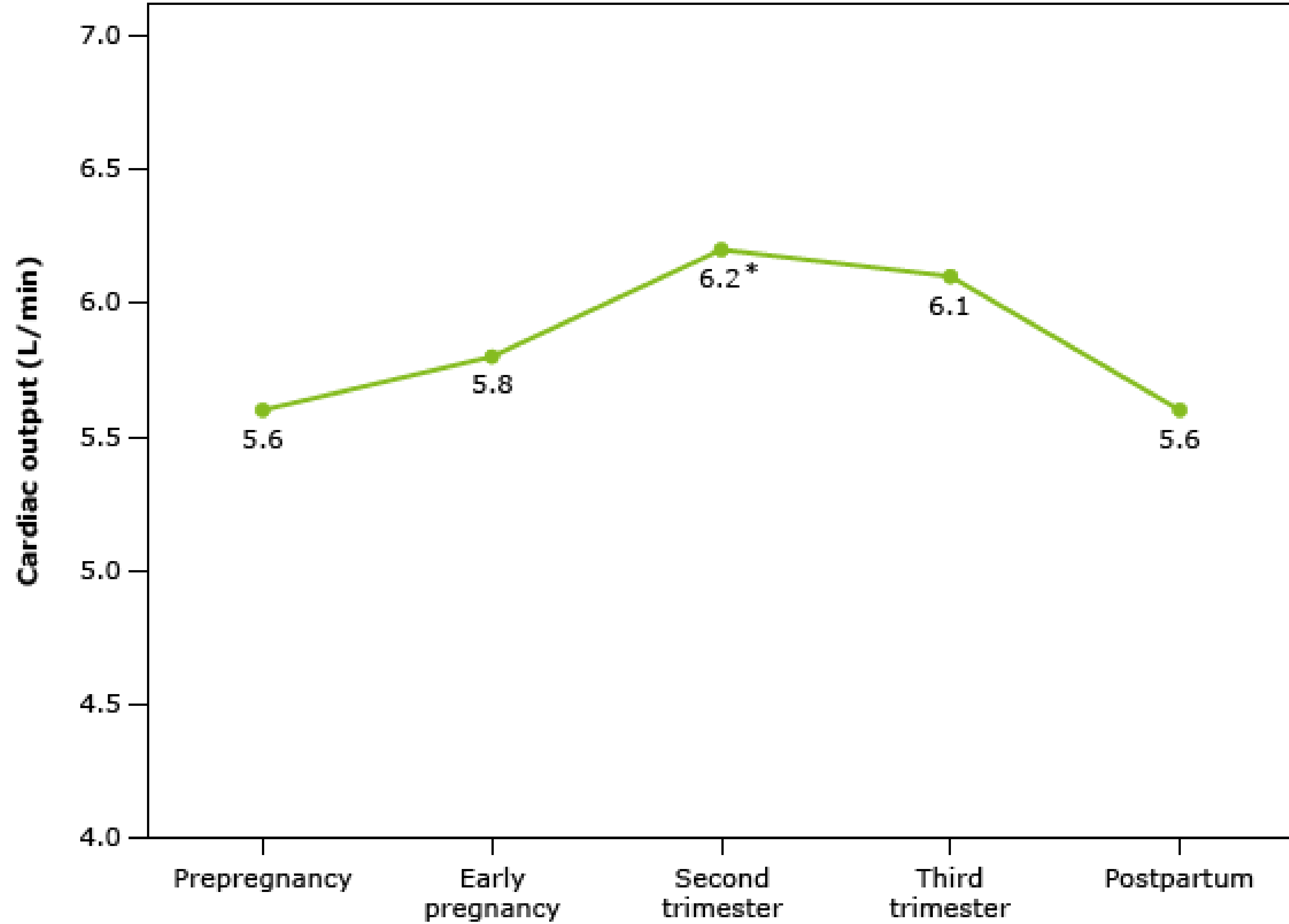
- Abdominal pain in trauma patients need a trauma workup
- Critical care ultrasonography is most commonly used in the A&E, & acts as a vital diagnostic tool for pregnant patients
- In absence of trauma assess for pregnancy related causes
- Vaginal bleeding & hypertension are important indicators of a serious pregnancy related cause
- Hypotension can be a sign of septic shock or severe haemorrhage
- Abdominal pain & Fever

Physiological changes of Pregnancy

Mais Al Shayeb

Cardiovascular System

- **Antepartum**
  - Cardiac output peaks in second trimester then starts going back to normal
  - Systolic blood pressure, diastolic and mean arterial pressure decrease
- **Intrapartum**
  - During contractions cardiac output increases progressively as labour advances
  - During second stage, pushing increases cardiac output up to 50% above the prelabour level


Cardiac output (L/min)
7.0
6.5
6.0
5.5
5.0
4.5
4.0
5.6
5.8
6.2*
6.1
5.6
Prepregnancy
Early pregnancy
Second trimester
Third trimester
Postpartum

Endocrine

- Increase insulin resistance and secretion
- Pituitary enlargement
- Increase TIBG and increase in total T4 and T3
- Maternal total plasma calcium concentration falls, because albumin concentration falls

Gastrointestinal

- Nausea and vomiting
- Decrease in GI motility
- Relaxation of LES
- Biliary stasis and cholesterol saturation (gallstones)

Haematology

- Hypercoagulable state
  - Increase in fibrinogen
  - Fall in protein S
  - Fall in platelets and factor 11 and 13
- Increase in WBC
- Plasma volume expands by 40-50% with expansion of red cell mass (dilutional anaemia)

Respiratory system

- No change in RR but increase in tidal volume (increase in minute ventilation)
- Physiological dyspnoea of pregnancy is an isolated finding
- FRC decreases by 20% during the latter half of pregnancy
- As a result of progesterone-induced increase in alveolar ventilation → respiratory alkalosis which is compensated by renal excretion of bicarbonate

Renal

- Dilatation of renal collection system (up to 2 cm is acceptable) and is often greater on the right
  - The ureter will taper to a normal calibre as it crosses the pelvic brim
- Slight increase in GFR
- Mild glucosuria, proteinuria

Diagnostic Evaluation

Salem Abu Mahfouz

History

- Pregnant patients should be asked about previous & current obstetric history
- Patients should also be asked whether they have any vaginal bleeding or leaking of fluid

Physical Examination

- Vital Signs
- Abdominal Examination
  - Inspection
  - Palpation
  - Auscultation
  - Percussion
- Uterus
- Fetal Heart Rate
- Fetal Membranes
- Cervix

Laboratory

- Laboratory tests can help narrow the differential diagnosis
- In general
  - Complete Blood Count
  - Urinalysis
  - Basic Metabolic Panel
  - Liver & Pancreatic biochemical & function tests
    - Aminotransferases, Bilirubin, Amylase, & Lipase
- Pregnant patients with hemodynamic instability should have blood sent for coagulation studies & crossmatch

Imaging

- Should not be avoided in fear of harm to fetus if medically indicated
- Delay in diagnosis & treatment can increase the risk of an adverse maternal &/or fetal outcome
- Ultrasound – Preferred modality for evaluating the fetus
- Modalities using ionizing radiation
- MRI – preferred against CT as it avoids ionizing radiation

Laparoscopy

- Sometimes indicated in evaluation of acute abdominal pain
- Usually performed in first or second trimester
- Based on retrospective evaluation and survey data, laparoscopic surgery for evaluation of abdominal/pelvic pain in pregnancy appears to be as safe as laparotomy
- When surgery is planned, the appropriate services (Obstetrics, General Surgery, Anaesthesia, Paediatrics) should be consulted.

Obstetric Causes

Sara Mrshed
Mohammad Al Damen

Early Pregnancy

Mohammad Al Damen

Miscarriage

- Key clinical features
  Pain
  bleeding
- Specific investigations
  Ultrasound scan.
  hCG “laboratory test”.
  progesterone levels “ serum progesterone” .
- Management
  Expectant
  Medical
  Surgical

Ectopic Pregnancy

- Key clinical features
  - Pain followed by a small amount of bleeding
  - Peritoneum, shoulder tip and rectal pain
  - May present with diarrhea
- Specific investigations
  - Ultrasound scan.
  - hCG “laboratory test”.
  - progesterone levels “ serum progesterone” .
- Management
  - Expectant
  - Medical
  - Surgical

Ruptured Corpus Luteal Cyst

- Key clinical features
  Signs of peritonism
- Specific investigations
  Ultrasound scan
- Management
  Analgesia
  +/- Laparoscopy

Adnexal Torsion

- Common in 1st & 2nd Trimester & Postpartum
- Key clinical features
  - Twisting pain
  - Signs of peritonism
- Specific investigations
  - Ultrasound scan
- Management
  - Analgesia
  - +/- Laparoscopy

Late Pregnancy

Sara Mrshed

Round Ligament Pain

- Key clinical features
  - Bilateral, stitch like
- Specific investigations
  - None
- Management
  - Analgesia
  - Reassurance

Braxton Hicks

- Key clinical features
  - Painful/painless tightening
  - Without cervical dilations
- Specific investigations
  - Vaginal examination to exclude labor
- Management
  - Reassurance

Labour

- Key clinical features
  - Painful contractions
- Specific investigations
  - Vaginal examination
  - CTG
- Management
  - Consider tocolysis and steroid if preterm

Placental Abruption

- Key clinical features
  - Constant pain
  - Rigid uterus and short contractions
  - +/- Bleeding
- Specific investigations
  - Fetal assessment
  - CBC
- Management
  - Resuscitation and delivery

Pre-eclampsia

- Key clinical features
  - Epigastric, right upper quadrant pain
- Specific investigations
  - All pre-eclampsia investigation :
    - CBC, platelet count, LDH: if abnormal, order D-dimers, coagulation panel, and smear
    - Renal studies: serum BUN creatinine and uric acid, urinalysis, 24-hr urine for protein and creatinine, or protein/creatinine ratio
    - Liver function tests: AST, ALT, and bilirubin
- Management
  - Treat blood pressure
  - Consider delivery

Acute Fatty liver

- Key clinical features
  - Epigastric/right upper quadrant pain
  - Associated with malaise, nausea and vomiting
  - May be Jaundice and have ascites
- Specific investigations
  - All pre-eclampsia investigation
  - May have hyperuricemia, hypoglycemia deranged LFT
  - Ultrasound /CT or MRI of liver
- Management
  - Stabiliz and deliver

Polyhydramnios

- Key clinical features
  - Tight, distended abdomen
  - Difficult to feel fetal parts
- Specific investigations
  - Ultrasound
  - Exclude diabetes and infections (TORCH)
- Management
  - Detailed fetal scan
  - Consider amino drainage

Adnexal Torsion

- Key clinical features
  - Twisting pain
  - Peritonism
- Specific investigations
  - Ultrasound
- Management
  - Analgesia
  - +/- Laparoscopy

Fibroid Degeneration

- Key clinical features
  - Constant localized pain over the fibroid
- Specific investigations
  - Ultrasound to confirm fibroid and degenerative cystic changes may be present
- Management
  - Analgesia

Uterine Rupture

- Key clinical features
  - Sudden onset constant pain
  - Hemodynamic collapse
  - Vaginal bleeding
  - Hematuria
- Specific investigations
  - CBS
  - Cross match
  - CTG
- Management
  - Resuscitate and surgery

Urinary Retention

- Key clinical features
  - Unable to pass urine
  - Palpable and uncomfortable bladder
- Specific investigations
  - Catheter
  - Ultrasound will help exclude other causes
- Management
  - Conservative management, usually resolve after 12 weeks

Ureteric Obstruction

- Key clinical features
  - Right angle tenderness
- Specific investigations
  - Ultrasound to assess renal pelviectasis (2cm normal)
- Management
  - Usually Conservative, if significant may require nephrostomy

Chorioamnionitis

- Key clinical features
  - Tender uterus
  - Offensive discharge
  - Systemic signs of sepsis
  - Usually preceded by ruptured membranes
- Specific investigations
  - Blood cultures and inflammatory markers
  - Speculum and CTG
- Management
  - IV antibiotics, resuscitate and deliver

Non-Obstetric Causes

Roa' Abo Faris

Urinary Tract Infection (UTI)

Risk factors:

Asymptomatic bacteriuria

Key clinical features:

Dysuria
Frequency of micturition
Urgency

Specific Investigation:

Urine dipstick (nitrates, leukocyte and RBCs).
Urinalysis
Urine for culture

Management:

Increased oral intake of fluid
Antibiotics

E.coli is responsible for 70-90% of infections.

Pyelonephritis

- **Key clinical features:**
- Renal angle tenderness, radiating to abdomen and into groin area
- Rigors
- **Specific Investigation:**
- Blood cultures
- Urine dipstick and culture
- Urinalysis
- Renal U/S
- **Management:**
- Hospital admission
- Antipyretic
- IV antibiotics
- IV fluids

Renal Calculi

- The incidence of renal stones in pregnancy is quoted to be 1 in 1500, more common than in non-pregnant reproductive aged females.
- **Key clinical features:**
- Renal angle tenderness, radiating to abdomen and into groin.
- Often Colicky in nature
- Hematuria, Pyuria
- **Specific Investigation:**
- Urine dipstick to look for microscopic hematuria
- Urine for culture
- Renal U/S
- **Management:**
- Conservative management with fluids and analgesia; involve urologists.

Constipation

➢**Key clinical features:**
- Constant or colicky abdominal pain
- Infrequent, hard stools

➢**Management:**
- Dietary advice, stool softeners

Peptic Ulcer Disease

- **Key clinical features:**
- Epigastric pain, often constant or burning.
  - Duodenal ulcers relieved by food
  - Gastric ulcer made worse by food
- May be associated with nausea, vomiting, and hematemesis.
- **Specific Investigation:**
- Gastroscopy if sever, involve gastroenterologists
- **Management:**
- Antacids and ulcer-healing drugs
- H2- receptor antagonists/proton-pump inhibitors

Appendicitis

- Appendicitis occurs in 0.05% to 0.07% of pregnancies with the highest frequency of cases occurring during the second trimester of pregnancy
- **Key clinical features:**
- Pain, not always localized to right iliac fossa, especially in third trimester(depends on Gestational age of pregnancy); signs of peritonism; associated with anorexia, nausea, vomiting.
- Fever may or may not be present
- Increased WBC may be present in appendicitis or normal pregnancy
- **Specific Investigation:**
- Inflammatory markers (WBC, CRP); U/S of the abdomen +/- MRI; pyuria may be present.
- Non-compression and dilation of the appendix on U/S are diagnostic of appendicitis. Non-visualization does not exclude appendicitis
- **Management:**
- Involve general surgeons, surgical management
- **Complications**:
- May lead to ruptured appendix if diagnosis delayed 24-48
- May lead to SAB, preterm labor, and preterm delivery

Bowel Obstruction

- ➢ The incidence of bowel obstruction in pregnancy is approximately 1 in 17 000 deliveries, the risk increases as the uterus enlarges into the upper abdomen with advancing gestation.
- ➢ Adhesions and volvulus are the most common cause
- ➢ **Key clinical features:**
- Colicky abdominal pain, associated with vomiting and nil passed per rectum; high-pitched or absent bowel sounds Abdominal distention; usually have risk factors; perforation will cause signs of peritonism
- ➢ **Specific Investigation:**
- Abdominal X-ray; U/S; MRI, Involve general surgeons; colonoscopy
- ➢ **Management:**
- Conservative management- IV fluids, nasogastric tube; may require surgery

Cholecystitis / Cholelithiasis

- The reported incidence of gallstone-related disease in pregnant patients is low (<1 percent)
- During pregnancy, increased levels of reproductive hormones (e.g., estrogen, progesterone) induce a variety of physiologic changes in the biliary system that promote gallstone formation, Estrogen increases cholesterol secretion and progesterone reduces bile acid secretion and slows gallbladder emptying.
- **Risk factors:** pre-pregnancy obesity and multiparity.
- **Key clinical features:**
  - Epigastric or right upper quadrant pain (colicky or stabbing); may radiate through to back and be associated with nausea and vomiting; intolerance of fatty food; tenderness and guarding
- **Specific Investigation:**
  - U/S of gallbladder/liver, LFTs
- **Management:**
  - Conservative management- Analgesia, fluids, antibiotics if infected, surgery may be indicated

Pancreatitis

- ➢ Acute pancreatitis (AP) is a rare event in pregnancy, occurring in approximately 3 in 10 000, most cases are related to gallstone disease.
- ➢ **Key clinical features:**
- Epigastric pain, radiated through to back; associated with nausea, vomiting, and fever. May be relieved with leaning forward.
- ➢ **Specific Investigation:**
- U/S of upper abdomen, CT scan, LFTs, Amylase and lipase three times normal, Calcium low, High blood glucose
- ➢ **Management:**
- Involve surgeons, conservative management; use of prognostie scoring systems

✓ Acute pancreatitis can be diagnosed in the presence of 2 of 3 classic features:

- Classic symptoms
- Elevated amylase/lipase
- Characteristic imaging findings(e.g., CT scan)

Gastroenteritis

➢ **Key clinical features:**

- Generalized, usually crampy abdominal pain, associated with diarrhea, nausea and vomiting.

➢ **Specific Investigation:**

- Stool sample

➢ **Management:**

- Fluids; manage at home if possible

Hepatitis

- **Key clinical features:**
  - Right upper quadrant/epigastric pain; may be associated with jaundice
  - Anorexia and nausea
- **Specific Investigation:**
  - U/S of liver, LFTs, Hepatitis screen
- **Management:**
  - Involve hepatologist, depends on underlying cause

Strangulated Hernia

- **Key clinical features:**
- Peritonism, may be associated with bowel obstruction
- **Specific Investigation:**
- Involve surgeons
- **Management:**
- Involve surgeons, treat bowel obstruction

Inflammatory Bowel Disease

➢**Key clinical features:**

- Generalized pain, associated with diarrhea, mucous and rectal bleeding, vomiting, weight loss

➢**Specific Investigation:**

- Inflammatory markers, sigmoidoscopy, colonoscopy.

➢**Management:**

- Involve gerontologists, steroids, mesalamine, other immune modulators such as azathioprine

Abdominal Bleeding

- **Key clinical features:**

- Very rare, retoured liver capsule, splenic artery aneurysms, aortic aneurysms, cause hemorrhagic shock and abdominal pain

- **Specific Investigation:**

- FBC, Cross-match, assess fetal wellbeing with CTG

- **Management:**

- Resuscitate, surgical management

Pelvic Vein Thrombosis

- **Key clinical Features:**
  - Often thrombosis of right/left iliac vein, causing groin tenderness, leg swelling, sometimes pyrexia
- **Specific Investigations:**
  - Doppler U/S, venogram, thrombophilia screen
- **Management:**
  - Anticoagulation using LMWH, involve hematologists, may require filter in inferior vena cava

Systemic Causes – DKA, SC Crisis, & Increased Ca

- **Key clinical features:**
- Generalized abdominal pain, pain, associated with being systemically unwell
- **Specific Investigations:**
- Urea, electrolytes, blood glucose, bone profile
- **Management:**
- Treatment depends on cause; involve the general physicians

Trauma

❖Remember domestic violence

➢**Key clinical features:**

- Associated with bruising domestic violence commonly results in abdominal trauma during pregnancy

➢**Specific Investigations:**

- Assessment of fetal wellbeing, Keilhauer's test, particularly if rhesus negative, check for other injuries

➢**Management:**

- Ensure safety, specialist midwifery service, social input

Pneumonia

- **Key clinical features:**
  - Right lower-lobe pneumonia may cause right upper quadrant pain; associated with respiratory symptoms
- **Specific Investigations:**
  - Chest X-RAY, blood gases, inflammatory markers, sputum cultures
- **Management:**
  - Antibiotics, may require oxygen and high-dependency support if severe

Rectus Abdominis Rupture

➢ **Key clinical features:**

- Sudden onset pain , usually precipitated by cough or vomit; rare and usually in multiparous women ; may have associated haematoma

➢ **Specific Investigations:**

- Exclude other causes of abdominal pain

➢ **Management:**

- Analgesia; expanding haematoma may require surgical exploration

Symphysis Pubis Dysfunction

➢**Key clinical features:**

- Suprapubic tenderness, over bones; worse on movement and standing on leg

➢**Specific Investigations:**

- Full physiotherapy assessment

➢**Management:**

- Physiotherapy, analgesia

Indication of C/S Delivery

- Urgent C-section may be recommended if
  - Foetal distress (foetal bradycardia)
  - Maternal cardiopulmonary arrest
  - If patient is septic or approaching term

Laparoscopic surgery in pregnancy

- Laparoscopy is indicated in the evaluation of acute pelvic or abdominal pain
- The procedure has been avoided during pregnancy in the past because of concerns of harmful effect on the foetus
  - Foetal hypoxia
  - Foetal acidosis
  - Foetal injury due to risk of uterine perforation
- However, it can be performed safely and effectively in pregnant women like laparotomy
- Done in appendicitis, gallbladder disease, adnexal masses or torsion
- It is usually performed in the first, second, and early third trimester
- Pregnant women are placed in the left lateral recumbent position to minimize uterine compression of the vena cava and the aorta

THANK YOU