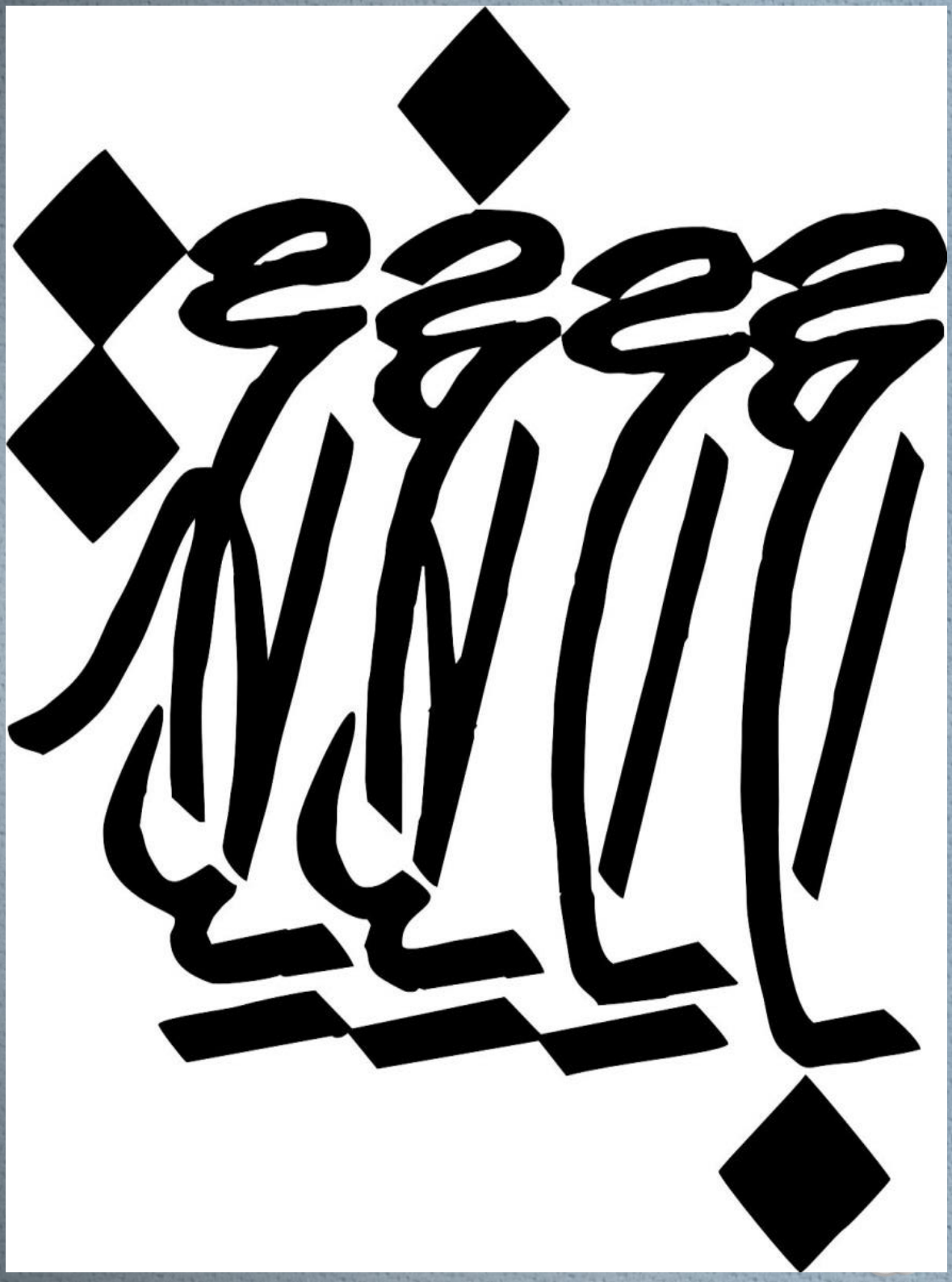
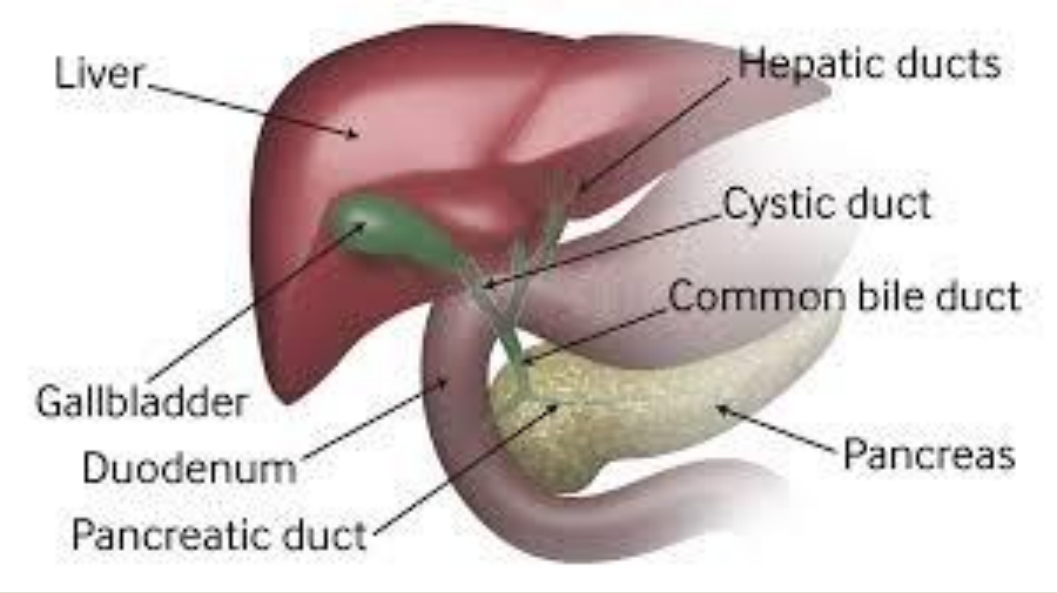


Gallstones

Acute cholecystitis

pancreatitis



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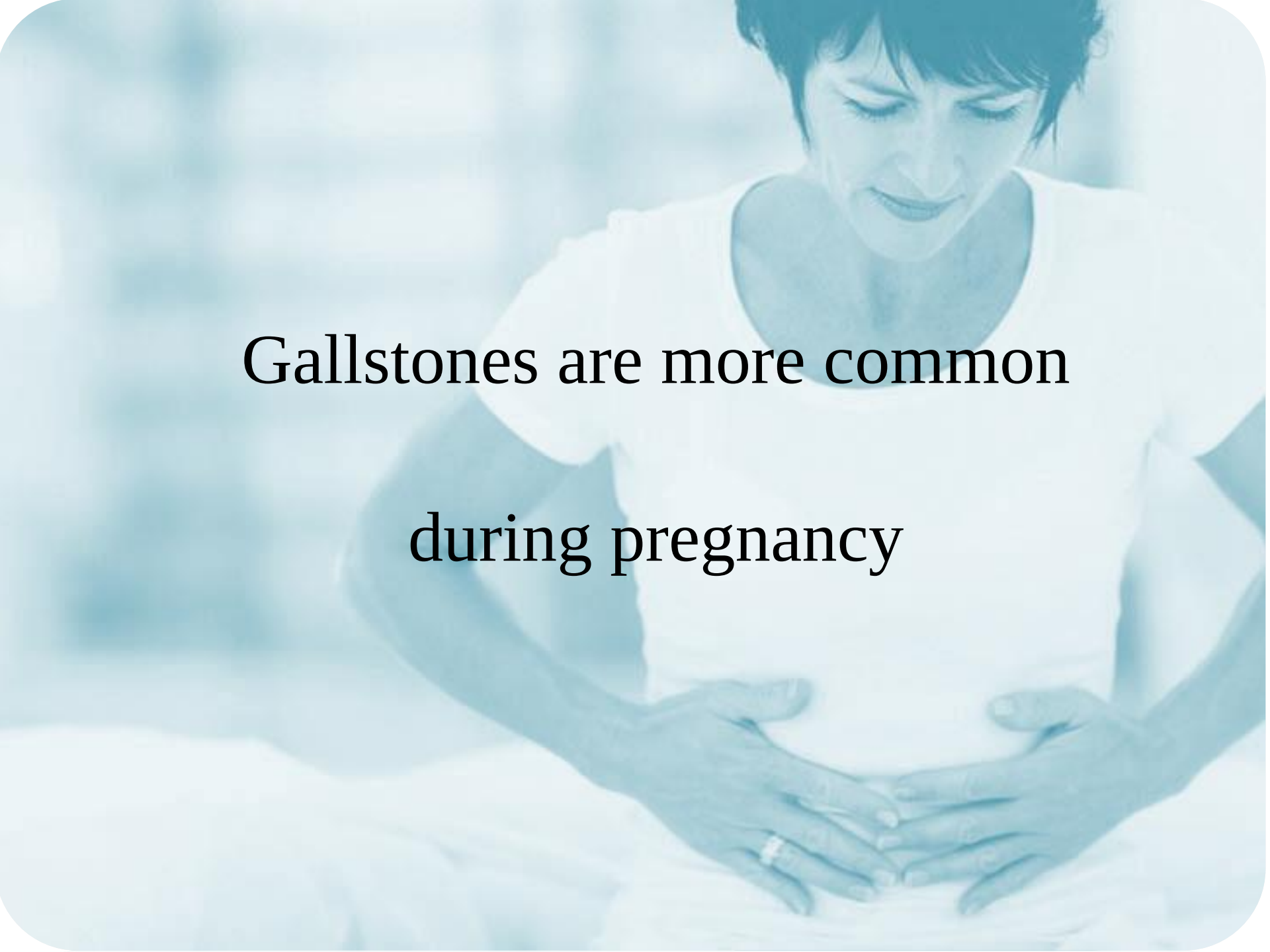

Gallstones are more common
during pregnancy

PATHOPHYSIOLOGY

- Estrogen increases cholesterol secretion and progesterone reduces bile acid secretion, which ultimately causes bile to become supersaturated with cholesterol.

- Progesterone slows gallbladder emptying, which further promotes the formation of stones by causing bile stasis.

These changes normalize one to two months following delivery.

PERSONAL RISK FACTORS

- Prepregnancy obesity
- Multiparous
- Increasing age
- Genetic background

- In a prospective study, dietary fat and protein intake during pregnancy did not appear to affect women's risk of forming biliary sludge and stones during pregnancy or up to four to six weeks postpartum

INCIDENCE AND COURSE

- 0.05 to 0.33 percent

3200 pregnant women without gallstones at their first ultrasound examination

developed any symptoms	only 1.2 percent
second trimester	7.1
third trimester	7.9
by four to six weeks postpartum	10.2

Ducarme G, Maire F, Chatel P, et al. Acute pancreatitis during pregnancy: a review. J Perinatol 2014; 34:87.

Serious complications of gallstones, such as acute cholecystitis, choledocholithiasis, gangrenous gallbladder, or pancreatitis, developed in <10 percent of symptomatic patients

CLINICAL FEATURES

- Asymptomatic patients
- Symptomatic patients
  - recurrent pain attacks (biliary colic)
  - one and three hours postprandially
  - A history of fatty food ingestion
- acute cholecystitis
  - RUQ or epigastric pain that is steady and severe, prolonged (more than four to six hours), and possibly radiating to the right shoulder or back.
  - fever,
  - anorexia,
  - nausea, and vomiting.
  - voluntary and involuntary guarding
  - a positive Murphy's sign.
- The constitutional symptoms and prolonged duration of pain help to distinguish acute cholecystitis from biliary colic.

DIAGNOSTIC TESTING IN PREGNANCY

Laboratory evaluation

- Aspartate aminotransferase/alanine aminotransferase (AST/ALT), total bilirubin, alkaline phosphatase (to evaluate for complicated gallbladder disease, HELLP [Hemolysis, Elevated Liver enzymes, Low Platelet count], severe preeclampsia)
- Serum amylase and lipase (to evaluate for pancreatitis)
- Complete blood count (to evaluate for infection, HELLP syndrome, severe preeclampsia)
- Urine protein (to evaluate for preeclampsia)

Imaging

- Ultrasonography
  - reliable and safe method
  - sensitivity and specificity approaching 100 percent
  - A diagnosis of acute cholecystitis is suggested by additional findings of
    - gallbladder distention,
    - gallbladder wall thickening,
    - pericholecystic fluid, and
    - the ultrasonographic Murphy's sign.

Magnetic resonance imaging

- Magnetic resonance cholangiopancreatography (MRCP) is not typically used in the evaluation of biliary colic or acute cholecystitis

but

- may be useful in some complicated cases, such as women with choledocholithiases or pancreatitis if ultrasound is nondiagnostic.
- Non contrast magnetic resonance imaging is an accepted, alternative imaging modality for pregnant women
- The use of magnetic resonance during the first trimester is not recommended

- The administration of Gadolinium during pregnancy is controversial, and we avoid gadolinium whenever possible but realize that, at times, it may be needed

HIDA scan

- Cholescintigraphy using 99mtc-hepatic iminodiacetic acid is not a first-line imaging test in patients with suspected gallstone-related disease .
- The fetal dose is <5 mgy (milligray)
- There is no evidence of an increased risk of
  - fetal anomalies,
  - intellectual disability,
  - growth restriction, or
  - pregnancy loss at this dose

- Other imaging modalities
  - computed tomography and plain radiographs

- Endoscopy
  - ERSP

MANAGEMENT

Supportive care

- Fluid replacement ……5 to 10 mL/kg per hour of isotonic crystalloid solution (in pancreatitis)

- Pain control
  - Intravenous Opioids
  - Nonsteroidal Anti-inflammatory Drugs (Nsaids) …….≤32w……48h
  - Acetaminophen ……Mild Pain

- Antibiotic therapy
  - acute cholecystitis or cholangitis
  - Pancreatitis….. unless there is reliable evidence of infection.
  - Escherichia coli, Enterococcus, Klebsiella, and Enterobacter

Monotherapy with a beta-lactam/beta-lactamase inhibitor:

- Ampicillin-sulbactam 3 g intravenously every six hours
- Piperacillin-tazobactam 3.375 g intravenously every six hours
- Ticarcillin-clavulanate 3.1 g intravenously every four hours

- An acceptable alternative
  - A third-generation cephalosporin, such as ceftriaxone 1 g Intravenously every 24 hours, plus metronidazole 500 mg intravenously every eight hours.
  - In patients with a significant penicillin allergy, clindamycin is given instead.

Biliary colic

- Most pregnant women with RUQ pain are generally observed in, or admitted to, labor and delivery
- Avoid eating, which may exacerbate the pain by releasing cholecystokinin
- Additional imaging and repeat laboratory studies are indicated if symptoms do not resolve with supportive care, to assess for complicated gallstone disease.

- For pregnant patients with a first episode of biliary colic
  - supportive care
  - surgery
- For patients with recurrent bouts of bothersome pain, or who are unable to gain weight at an acceptable rate due to the symptoms

- if biliary colic occurs near term, we avoid cholecystectomy and reevaluate the patient after delivery. ……six weeks

ursodeoxycholic acid

Follow up

- abdominal ultrasound four to six weeks postpartum
  - If sludge/stones persist……..cholecystectomy within three months after delivery
  - If sludge/stones disappear postpartum……take a watchful waiting approach …….with a low threshold for reimaging and surgical intervention

Complicated gallstone disease

- Acute cholecystitis
- Choledocholithiasis/cholangitis
- Gallstone pancreatitis

Acute cholecystitis

- right upper quadrant pain, fever, and leukocytosis associated with gallbladder inflammation.

- It typically occurs in patients with gallstones (ie, acute calculous cholecystitis), while acalculous cholecystitis accounts for a minority (5 to 10 percent) of cases.
-
- Complications of acute cholecystitis include gallbladder gangrene or perforation, which can be life-threatening.

Acute cholecystitis

- surgical therapy
  - any patient with cholecystitis and signs of sepsis, suspected gangrene, or perforation, as well as disease progression while on antibiotic therapy.
- In the absence of such indications for urgent or emergency surgery:
  - first and second trimesters
  - third trimester
    - If she responds to nonoperative treatment……..six weeks
    - If she continues to have symptoms or shows signs of developing complications in spite of nonoperative treatment…… cholecystectomy
    - For women deemed at high risk for surgery…….. percutaneous or open gallbladder decompression.

Percutaneous cholecystostomy is an option for patients with acute cholecystitis who have all of the following :

1. Contraindications to general anesthesia and/or high surgical risk
2. No coagulopathy or bleeding disorders
3. Late presentation (>72 hours after onset of symptoms)
4. Failure of medical (antibiotic) therapy

Choledocholithiasis/cholangitis

- ERCP
  - generally uses fluoroscopy for imaging, which can be accomplished safely during pregnancy with fetal shielding. Exposure to ionizing radiation during ERCP can also be minimized or eliminated by using specific techniques

- If ERCP is not available, not successful, or if the patient is deemed high risk, percutaneous or open biliary tract decompression may be appropriate for the patient with cholangitis.

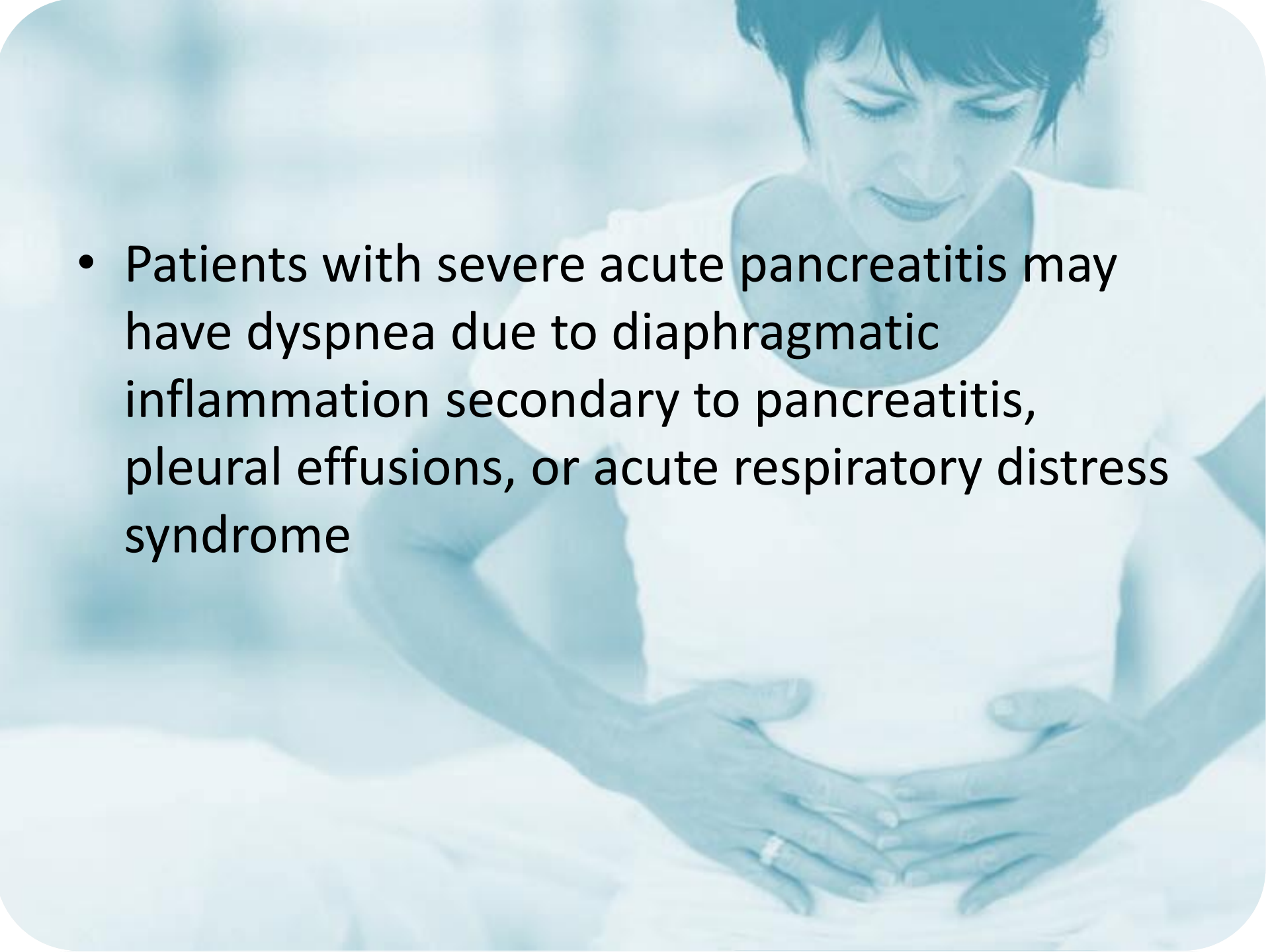
Gallstone pancreatitis

- Gallstone disease is the most common cause of acute pancreatitis during pregnancy,
    - At least 65 percent of cases
- Acute gallstone pancreatitis is associated with maternal mortality if not recognized and treated appropriately
- Management consists of initial supportive care
    - hospitalization,
    - pain control,
    - intravenous fluid therapy, and
    - nutritional support.

pancreatitis

- In patients with gallstone pancreatitis, the pain is well localized and the onset of pain is rapid, reaching maximum intensity in 10 to 20 minutes.
- In contrast, in patients with pancreatitis due to hereditary or metabolic causes or alcohol, the onset of pain may be less abrupt and the pain may be poorly localized.

- Approximately 90 percent of patients have associated nausea and vomiting which may persist for several hours



- Patients with severe acute pancreatitis may have dyspnea due to diaphragmatic inflammation secondary to pancreatitis, pleural effusions, or acute respiratory distress syndrome

ICU

- Patients with severe acute pancreatitis
- Patients with acute pancreatitis and one or more of the following parameters:
  - Pulse <40 or >150 beats/minute
  - Systolic arterial pressure <80 mmHg or mean arterial pressure <60 mmHg or diastolic arterial pressure >120 mmHg
  - Respiratory rate >35 breaths/minute
  - Serum sodium <110 mmol/L or >170 mmol/L
  - Serum potassium <2.0 mmol/L or >7.0 mmol/L
  - PaO2 <50 mmHg
  - pH <7.1 or >7.7
  - Serum glucose >800 mg/dL
  - Serum calcium >15 mg/dL
  - Anuria
  - Coma

CHOLECYSTECTOMY DURING PREGNANCY

- Pregnancy alone does not appear to increase postoperative morbidity for cholecystectomy

- Anesthesia and preoperative preparation
- prophylactic
  - Antibiotics
  - Positioning
  - Monitoring
  - Thromboprophylaxis, and
  - Pharmacologic management of preterm labor

Surgical techniques

- Laparoscopic cholecystectomy
  - slightly head-up and tilted to her left
  - to use the open (Hasson) technique
- Open cholecystectomy
  - A subcostal incision

POSTOPERATIVE CARE

- Fetal heart rate and uterine activity should be
- Assessed in the recovery room, as appropriate for gestational age.
- Following cholecystectomy……drinking clear liquids once the effects of anesthesia have worn off and then advance as tolerated to a low-fat diet.
- Patients who have had laparoscopic surgery …….Be discharged home on the day of surgery or the following day unless there are extenuating circumstances, such as uterine contractions, vaginal bleeding, pain, or unremitting nausea.
- A two- to four-day stay is usually necessary after open surgery.
- Acetaminophen or narcotics
  - (>2 weeks) postoperatively should be avoided
  - Epidural analgesia


Thank
you!