

INTRODUCTION

Gallstones disease represent the major cause of morbidity and mortality throughout the world. Cholecystectomy is the treatment of choice for symptomatic gallstones, because it removes the organ that contributes to the formation of gallstones, so preventing further complications (**Fried, Feldman and Klassen, 2009**). Most gallstones are asymptomatic, but still contributes substantially to the health care costs, added to its complications are sometimes life threatening. Gallstone disease typically affects fertile women aged 40-60 years who are slightly overweight. laparoscopic cholecystectomy (LC) requiring only a small wound, which causes relatively less pain, allows for early ambulation, require shorter hospital stay and associated with early return of intestinal movement and lower occurrence of incisional hernia (**Barthelssona, Norberga and Nordströmc, 2009**). Since its introduction in 1987, it has been the most commonly performed laparoscopy in the surgical practice. Current surgical knowledge claims it as the golden standard approach for benign gallbladder disease requiring surgery, added to its feasibility as a day case procedure (**Çelik et al., 2009**).

In the US, more than 700 000 cholecystectomies are performed each year, in 90% of these patients the operations were done laparoscopic ally. In developed countries, about 10% of adults and 20% of people over 65 yr have gallstones. The

prevalence of gallstone disease differs not only between countries but also between ethnic groups, added to age and gender (**Loureiro et al., 2011**). According to statistical department at El – Demerdash surgical Hospital in Cairo (**2010**), the incidence of laparoscopic cholecystectomy procedures were approximately 980 through this year. The most common complications of cholecystectomy are bleeding and wound infection. In some procedures, the bile duct is injured and can result in bile leakage into the abdomen which may require a separate procedure for repair. Gallstones can develop in the bile long after Cholecystectomy requiring endoscopic retrograde cholangiopancreatography to remove them. Some individuals may develop chronic diarrhea after gallbladder removal (**Bandi et al., 2009**).

The needs were defined as ‘the requirements of individuals to enable them to achieve, maintain or restore an acceptable level of social independence or quality of life. Needs-oriented theories emphasize the health professional’s role in helping the patient to meet his or her physiological and psychosocial needs. Traditionally health authorities and other health-related organizations at local, regional and national level set out to provide appropriate services to meet population needs seeking to achieve levels of health improvement, an acceptable level of social independence and improved quality of life (**Mansfield, Nathanson, Jayasinghe and Foyle, 2011**).

The World Health Organization (WHO) defined health as a “state of complete physical, mental and social wellbeing not merely the absence of disease or infirmity”. This definition indicates that it is not only the physical needs of ill patients that need to be addressed but also their psychological, social, spiritual, and environmental needs **(World health organization (WHO), 2009)**. Patients with LC are affected physiologically, psychologically and socially by the negative way, so it is important for such patients to assess their needs for improving the quality and value of the care for them. These needs include: physical (activities of daily living, physical preparation, correct diet and exercises), Psychological (reducing anxiety, fear from pain and complications and information about emotional health lifestyle), Social (increase social activities, work adjustment, positive coping and social support), spiritual (satisfaction, increase religious activities and motivation) and educational (information about surgical technique, investigations and treatment, postoperative pain management, control of postoperative side effects, complications management, wound care, follow – up and self-care post discharge) **(Adrian & Berg, 2010 and Rosén et al., 2010)**.

In recent years, efforts to enhance the quality of care had been provided to patients undergoing LC such as: important clinical aspects regarding patients' experiences and meeting needs before and after the surgery have been done. Nurses play

a key role in improving patients' wellbeing in the recovery and it is imperative that they employ a holistic approach in relation to symptoms management. Nursing care for patients undergoing LC involves early identifying of anxious and vulnerable patients to provide extended information about the operation and the recovery process. Patient information is a key factor for optimal management of postoperative symptoms. Consistent information about the surgery, anticipated sensory experiences and analgesics treatment may promote the recovery and make the patient to feel safe and comfortable at home. Support and necessary advice should not end with discharge from hospital (**Topal, 2007**).

Significance of the study:

Studies within the past ten years have determined that LC is the preferred approach for treatment of symptomatic gallstone disease, because it is not only safe but also associated with fewer post-operative complications, decreased morbidity and overall cost (**Chris et al., 2008**). Needs assessments are required to guide care planning in part because many patients do not communicate concerns to their clinicians. In addition, it provide a rich opportunity to more fully understand experiences of the patients. Moreover, careful assessment of patients' needs is central to the whole process of providing care (**Clarke, 2011**). Effective pre/post operative assessment of patients needs are fundamental to provide the safe surgical procedures. Therefore this study was aimed to assess the needs of patients undergoing laparoscopic cholecystectomy (**Celement, 2011**).

AIM OF THE STUDY

This study aims to assess the needs of patients undergoing laparoscopic cholecystectomy.

Research questions:

The research questions formulated to be answered during this study were:

- What are the needs of patients undergoing laparoscopic cholecystectomy?
- What are the relations between patients needs and their characteristics.

ANATOMY AND PHYSIOLOGY OF THE GALL BLADDER

Gallbladder is a pear-shaped, hollow, saclike organ, 7.5 to 10 cm long and 3cm wide. It has a capacity of 30 to 50 mL of bile. It is related to the inferior surface of the liver where it lies in the gallbladder fosse. It can be divided into funds, body and neck. The gallbladder is connected to the common bile duct by the cystic duct and supplied by cystic artery which is a branch of right hepatic artery. It receives sympathetic supply through colic plexus and hepatic plexus. It also receives a few twigs via phrenic nerve (**Kumar and Verma, 2010**).

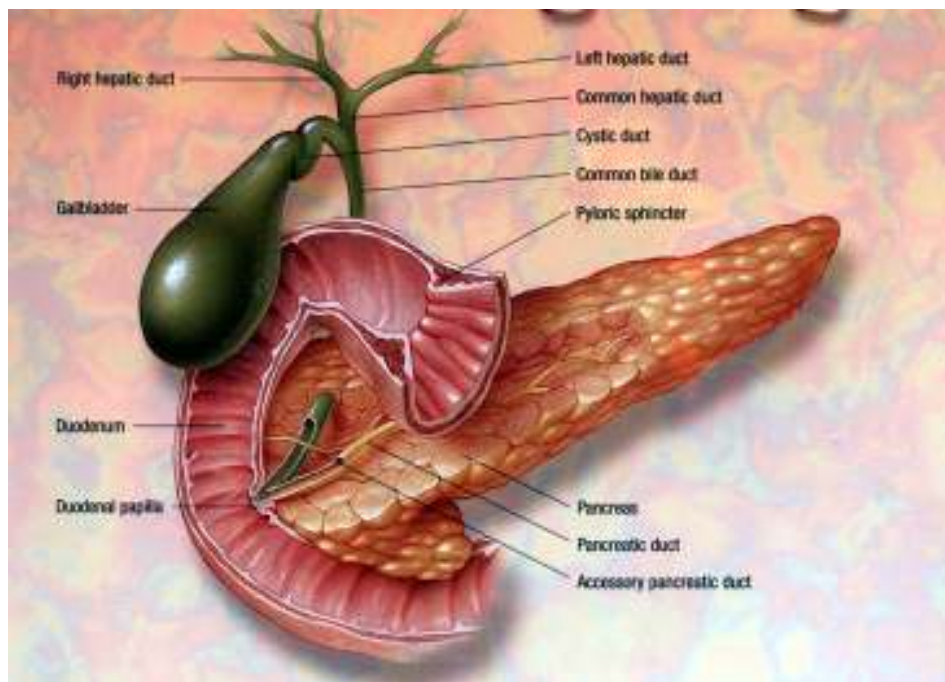


Fig. (1): Anatomy of liver, biliary system and pancreas. Quoted from: <http://www.gallbladderattack.com/gallbladderdisease.shtml> (**2007**).

Liver produces up to 20 times more bile than capacity of the gallbladder which concentrate and store the bile, also its cells absorb water and returning it to the surrounding capillaries (water, sodium, chloride and most electrolytes are absorbed from bile concentrating bile salts, cholesterol, lecithin and bilirubin). Capacity of the gallbladder is between 30 - 50 ml, its mucosa is formed of rugae that expand when receiving the bile. The muscularis is a smooth muscle layer, which contracts when stimulated to provide the force of bile ejection. In addition, Contractions of the gallbladder eject concentrated bile into the biliary tree and this is coordinated with relaxation of the sphincter of Oddi to allow bile to pass into the duodenum without resistance (**Joseph, 2007**).

Disorders of the Gallbladder:

Gallbladder disease is the most common and costly of all digestive diseases. The two most common gallbladder disorders are cholecystitis and cholelithiasis (**linton, 2007**). **Cholecystitis** is an inflammation of the gallbladder and divided as follows:

Acute Cholecystitis which follows obstruction of the cystic duct by a stone which increases pressure within the gallbladder, leading to ischemia of the gallbladder wall and mucosa. The Ischemia can lead to necrosis and perforation of the gallbladder wall. **Chronic cholecystitis** may result from repeated bouts of acute cholecystitis or from persistent irritation of the gall bladder wall by stones. Moreover, it is often

asymptomatic (**LeMone, Burke and Bauldoff, 2011**). In **calculous cholecystitis**, a gallbladder stone obstructs bile outflow, so bile remaining in the gallbladder initiates a chemical reactions (autolysis and edema) and the blood vessels in the gallbladder are compressed compromising its vascular supply added to, Gangrene of the gallbladder with perforation may result. Bacteria play a minor role in acute cholecystitis, however, secondary infection of the bile with *Escherichia coli*, *Klebsiella* species and other enteric organisms occurs in about 60% of the patients (**Brunicardi et al., 2009**).

Acute acalculous cholecystitis (AAC), is an inflammation of the gallbladder without evidence of calculi or sludge, comprises 2-15% of all cases of acute cholecystitis. AAC is traditionally known to occur in critically ill patients following cardiac surgery, abdominal vascular surgery, severe trauma, burns, prolonged fasting, total parenteral nutrition, or sepsis. AAC have a more fulminant course frequently associated with gangrene, perforation and empyema, as well as significantly higher morbidity and mortality. Moreover major cardiovascular disorders, complicated diabetes mellitus, autoimmune diseases and AIDS have all been recognized as possible predisposing factors for AAC (**Ganpathi, 2007**).

Cholelithiasis is the presence of one or more calculi (gallstones) in the gallbladder. In developed countries, about 10% of adults and 20% of people over 65 yrs have gallstones. Gallstones tend to be asymptomatic. The most common

symptom is biliary colic. More serious complications include cholecystitis, biliary tract obstruction (from stones in the bile ducts or choledocholithiasis), sometimes with infection (cholangitis) and gallstone pancreatitis. Diagnosis is usually by ultrasonography. If cholelithiasis causes symptoms or complications, cholecystectomy is necessary (Shaffer, 2007).

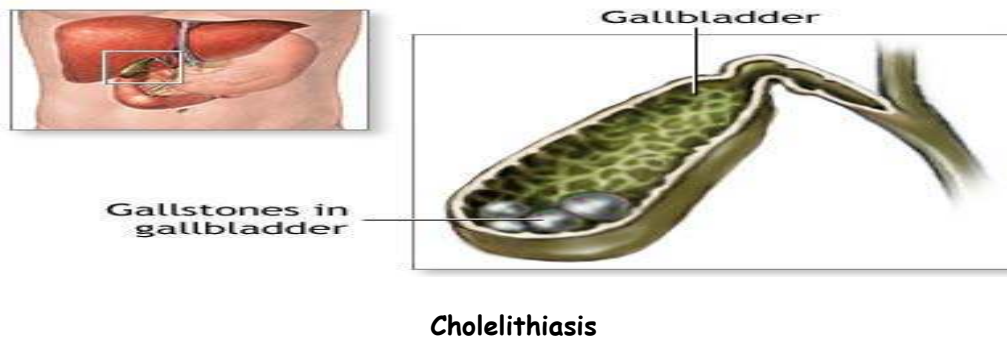


Fig. (2): Cholelithiasis. Qouted from
<http://www.gallbladderattack.com/gallbladderdisease.shtml> (2007)

Pathophysiology:

Bile primarily composed of water plus conjugated billirubin, organic and inorganic ions, small amounts of protein and three lipids: bile salts, lecithin and cholesterol. In addition, when balance of these three lipids remains intact, cholesterol is held in the solution and if the balance is upset cholesterol can began to precipitate. Depending on their compositions, gallstones are often divided into three major types: black pigment, cholesterol and brown pigment stones. **Black stones**, result from an increase in unconjugated billirubin and calcium with corresponding decrease in the bile salts. It is very small

hard and usually numerous (**Monahan, Sands, Neighbors, Marek and Green, 2007**).

Brown stones, are often caused by stasis and infection in the biliary system. In the Western world, the major constituent of gallstones is cholesterol which comprises 50-98 % of the dried substance of the stone. Other constitutes may include fatty acids, triglycerides, proteins, polysaccharides, as well as calcium bilirubinate, calcium carbonate and calcium bicarbonate. Gallbladder stones vary in size from less than a millimeter up to a few centimeters in diameter. Most patients only harbor stones in the gallbladder, but in 10-15 % the stones have migrated into the common bile duct (**Tazuma, 2006**).

Cholesterol stones are caused by: super saturation of cholesterol in the bile, nucleation and growth of crystals and gallbladder dysmotility resulting in impaired emptying. The gallbladder stores and concentrates bile during: fasting, after gastric emptying, after fatty meal and mediated by the cholecystokinin hormone, so contracts simultaneously with relaxation of the Odd sphincter resulting in, an extrusion of concentrated bile which mixes with food in the duodenum. Biliary colic is considered to be caused by the impaction of one or more stones in neck of the gallbladder. Increasing intraluminal pressure, contraction and distension of the gallbladder give rise to biliary pain (**Halldestam, 2008**).

Risk factors for the gallstone formation: Several risk factors are involved in the gallstone formation such as: **Gender**, women between the ages of 20 and 40 are twice as likely to get gallstones as compared to men. **Estrogen** increases amount of cholesterol in the bile which slow gall bladder emptying, allowing bile to remain in the gall bladder for longer periods of time. **pregenancy** increases the risk for cholesterol gallstones because, during pregnancy bile contains more cholesterol, and the gall bladder does not contract normally. **Obesity**, is a significant risk factor for gallstones, when the liver over-produces cholesterol, which is delivered into the bile and causes it to become supersaturated. **Rapid weight loss**, increases cholesterol production in the liver which results in super saturation and increasing risk for gallstones (**Admin, 2009 and Simon, 2011**).

Gall stone disease increases with the age, type 2 diabetes, dyslipidaemia (hypertriglyceridaemia and low HDL [high density lipoprotein], serum cholesterol), hyperinsulinaemia, and sedentary lifestyle. All these conditions are risk factors for the metabolic syndrome of which cholesterol gallstone disease is deemed as just another complication. The consumption of the high calorie diet is clearly a key factor in cholesterol gallstone disease (**Portincasa, Moschetta and Palasciano, 2006**).

Signs and Symptoms of cholecystitis and cholelithiasis are similar. Objective symptoms include evidence of inflammation, such as an elevated temperature, pulse and

respirations, vomiting and jaundice which are more common present with acute choledocholithiasis, because the common bile duct is blocked or inflamed. Subjective symptoms include patient complaints of epigastric pain, right upper quadrant (RUQ) tenderness, nausea, indigestion, flatulence (gas) and eructation (belching). Patient may have a positive Murphy's sign, which is the inability to take a deep breath when an examiner's fingers are pressed below the liver margin **(Williams and Hopper, 2006)**.

The epigastric pain which caused by cholelithiasis may also be called biliary colic (steady, aching, severe pain in the epigastrium and RUQ that may radiate back to behind the right scapula or to the right shoulder). It usually begins suddenly after a fatty meal and lasts for 1 to 3 hours. If it caused by a stone in the common bile duct (choledocholithiasis), it may last until the stone has passed into the duodenum **(Spencer, 2012)**.

Complications: Gangrenous cholecystitis, perforation of the gallbladder wall, peritonitis with a considerable mortality, perforation with localized pericholecystic abscesses is more common, mass in the right upper abdominal quadrant may be palpable under these circumstances. A perforation of a gallstone into another part of the gastrointestinal tract may cause a cholecystoenteric fistula, added to air in the biliary tree (pneumobilia). Passing of a gallstone from the biliary tract to the intestinal tract through a fistula may cause gallstone ileus, with a mortality of 15 to 20 % **(Clavien and Baillie, 2006)**.

Assessment and Diagnostic Findings:

Abdominal X-Ray, 15% to 20% of gallstones are calcified sufficiently to be visible on such x-ray studies (Federrer, 2011).

Ultrasonography of the gallbladder confirms cholelithiasis in most patients and distinguishes between obstructive and non obstructive jaundice, calculi as small as 2 mm can be detected (Barroso, 2006).

Cholescintigraphy also called (Diisopropyl Iminodiacetic Acid (DISIDA), Hepatobiliary Iminodiacetic Acid (HIDA) scan, or gallbladder radionuclide scan). A small amount of radioactive dye is administered and then a scanning device is used to track the dye as it moves into the gallbladder. This labeled derivative is rapidly absorbed by the liver and excreted into the bile this screening method can spot a blocked duct and acute inflammation, but not chronic gallbladder inflammation or gallstones. It may be useful in determining whether cholecystectomy will benefit a patient with chronic biliary pain without gallstones. Prolonged fasting and acute cholecystitis can result in false-positive results (Rodriguez, 2012).

Endoscopic retrograde cholangiopancreatography (ERCP):

Is a test that combines x-ray with endoscopy, to find the cause of jaundice and bile duct stones. The test takes one half to

two hours. After receiving medication for pain and sedation, the patient swallows the endoscope. If necessary, the physician can remove or relieve obstructions, widen ducts, drain bile and take biopsies with instruments inserted into the scope. Patients are NPO six to twelve hours before the test and may require overnight hospitalization if corrective measures were done (**Herzberger, 2007**)

Medical treatment:

The major objectives of medical therapy are to reduce the incidence of acute episodes of gallbladder pain and cholecystitis (**Smeltzer and Bare, 2010**).

Nutritional and supportive therapy: Approximately 80% of the patients with acute gallbladder inflammation achieve remission with rest, intravenous fluids, nasogastric suction, analgesia, and antibiotic agents. Unless the patient's condition deteriorates, surgical intervention is delayed until the acute symptoms subside and a complete evaluation can be carried out (**Day, Paul, Williams, Smeltzer and Bare, 2010**). The diet immediately after an episode is usually limited to low-fat liquids. Patient can stir powdered supplements high in protein and carbohydrate into skim milk. Cooked fruits, rice or tapioca, lean meats, mashed potatoes, non-gas-forming vegetables, bread, coffee, or tea may be added as tolerated. Patient should avoid eggs, cream, pork, fried foods, cheese and

rich dressings, gas-forming vegetables **e.g.** (cabbage, broccoli, onions, cauliflower and rutabagas) and alcohol (**Dudek, 2006**).

Pharmacologic therapy: Oral dissolution therapy uses bile acids in pill form to dissolve gallstones and may be used in conjunction with lithotripsy. Ursodiol (ursodeoxycholic acid, Actigal) and chenodiol (Chenix) are the standard oral bile acid dissolution drugs. Patients most likely to benefit from this treatment are those who have small stones (less than 1.5 cm in diameter) with high cholesterol content. Patients who probably will not benefit from this treatment include obese patients and those with gallstones that are calcified or composed of bile pigments (**Simon and Zieve, 2011**).

Nonsurgical removal of gallstones:

Contact dissolution therapy, requires the injection of the organic solvent methyl tert-butyl ether (MTBE) into the gallbladder to dissolve gallstones. The ether remains liquid at body temperature and dissolves gallstones within 5 - 12 hours. Investigative Agents and fatty acid bile acid conjugates (FABACs) are experimental agents, that are being investigated for dissolving gallstones and for preventing gallstone formation (**Calabro, 2012**).

ERCP endoscope, used when one or more gallstones have migrated out of the gallbladder and into the common bile duct. Patients are generally awake during this procedure, but