



Daffodil
International
University

Project on
Gallstone disease prevalence, risk factors, and therapy in a Bangladeshi adult population

[In the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy]

Submitted To

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Faculty of Allied Health Sciences,
Daffodil International University

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APPROVAL

This project paper, “**Gallstone disease prevalence, risk factors, and therapy in a Bangladeshi adult population**”, submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy and approved as to its style and contents.

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DECLARATION

I hereby declare that this project report, “**Gallstone disease prevalence, risk factors, and therapy in a Bangladeshi adult population**”. I am declaring that this Project is my original work. I also declare that neither this project nor any part thereof has been submitted elsewhere for the award of Bachelor or any degree.

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Dedication.....

My Parents

The persons who always encourage me in every sphere of my life

Abstract

A major worldwide health problem is gallstone disease. People all over the globe can develop gallstones, but Asians are less likely to do so. 11.6 percent of the interviewees had gallstone diseases, while 88.4 percent were unaffected. According to the evaluation, 4.3% of people with pigment and 18.8% of people with cholesterol stones have gallstone disease, while 76.8% are unaffected. Studies show that the majority of individuals (40.6%) believe an ultra-sonogram to be a diagnosis of gallstone disease. The prevalence was highest in adults (47%). The lowest incidence is in the elderly (7%). Most cases of gallstone illness affect adults. Exploration has led us to believe that chenodiol and ursodiol have been used most frequently. They were able to identify their illness by observing a number of symptoms, including 1. Sudden & rapidly intensifying pain in the upper right portion (43.8%), according to the poll. 2. Back discomfort in the shoulder area (25%). According to the examination, 17% of patients took their medication for six months, 33% of patients took it for three months, and 45% of patients took it for one month. According to the examination, 35% of patients reported feeling dazed or sleepy after surgery, 33% of patients reported feeling better, and 17% of patients regularly visit the doctor after surgery. According to the examination establish, 3% of patients consult a doctor after seven days, 11% after ten days, and 16% after fifteen. Measures they took 1. Out of prudence, 58.85% of patients refrain from smoking after surgery. 2. As a measure of caution, 58.85% of patients avoid fatty sauces after operation. Following surgery, 35.3 percent of patients rested for two to three weeks, and 29.4 percent rested for three to seven days, per the examination. Impacts they experienced following surgery or taking medication, 35.3% of patients reported changing their bowl behaviors, 17.6% reported having frequent bowel movements, and 23.5% reported having bile duct infections.

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Chapter 1

Introduction

1.1. Gallstones

Bile from the digestive tract that has crystallized into masses known as gallstones can accumulate in the gallbladder. Gallstones can vary in size and shape from a grain of sand to a golf ball. [1] Gallstones can develop when one or more of the parts of bile concentrate due to an out-of-equilibrium chemical composition. Gallstone disease is widely recognized as an illness of the modern period. [2] Yet evidence of gallstones in the gallbladders of Egyptian corpses from 1000 BC suggests that people have known about them for a very long time. Even though the prevalence of gallstones varies by location, they are a global medical problem. [3] People of all ages are becoming more susceptible to gallstones, although their likelihood of recurring increases with age [4]. Gallstones are possible in one in five individuals over the age of 60. Only 10% and 20% of those who are diagnosed will develop signs within 5 and 20 years, correspondingly. [5] They frequently go undetected. As a result, there is a very slim chance that you will encounter symptoms 2.0 and 2.6 percent of the time [6]. [7] This paper provides a therapeutically helpful evaluation of the gallstone disease research with a focus on most recent knowledge of the pathogenesis, risk factors, studies, and treatments of gallstones. The aim of this work is to educate readers about current thinking surrounding this problem.

1.2. Pathogenesis of Gallstones

Gallstones that form in the gallbladder make up the bulk of these (80–90%) and are primarily composed of cholesterol (70%) in a matrix of pigments from bile, calcium salts, and glycoproteins. [8] Additionally, to pure and blended cholesterol stones, pure pigment stones are also discovered. Brown pigment stones are more common in Asia and are linked to biliary tract diseases (bacterial and helminthic irrational fear of bilirubin glucuronides). Individuals with cystic fibrosis, haemolytic anemia, poor hemopoiesis, and black pigment stones are all caused by calcium bilirubinate. Black pigment stones are thought to be caused by enhanced enterohepatic bilirubin cycling. [9]. Since pure cholesterol crystals are typically unsteady, protein is essential for the security of cholesterol stones [10]. When bile's ability to maintain cholesterol in solution is outstripped by the quantity of cholesterol present, crystals begin to form and eventually harden into stones. Cholesterol is basically impermeable in water, but it is soluble in bile when bile salts and phospholipids are combined to form mixed micelles and vesicles. [11] Gallstones made of cholesterol are

believed to form as a result of three specific flaws. Excessive cholesterol biosynthesis, which is the primary lithogenic strategy in obese people, may cause cholesterol supersaturation, a necessary condition for the formation of cholesterol gallstones. Bile concentration may eventually increase if the enterohepatic transport of bile acids is disrupted. An overnight fast temporarily alters the enterohepatic bile acid circulation, which alters the cholesterol/phospholipid ratio in the liver's excreted vesicles. Similar to how hormone therapy decreases a woman's bile acid production. [12] Pigment stones are a result of excessive bilirubin production in the bile caused by injured red blood cells. Patients with cirrhosis or chronic hemolytic diseases with significant bilirubin elimination, such as thalassemia or congenital spherocytosis, are more prone to develop black pigment stones. [13] Brown pigment stones can form in the bile ducts and are often followed by infection. Conjugated bilirubin is hydrolyzed by glucuronidases, which are released by bacteria in the biliary system, to produce glucuronic acid. [14]

1.3. Factors of Gallstone

The development of cholesterol gallstones is highly correlated with female gender, fecundity, and a family descent from gallstone disease. Gallstones are thought to be an outcome of the metabolic syndrome, and obesity in addition to other factors leading to the metabolic syndrome like dyslipidemia (in specific hyperlipoproteinemia type IV with hypertriglyceridemia and low HDL cholesterol), hyperinsulinemia-insulin resistance [15], or overt type 2 diabetes are risk factors for their formation. Oestrogen therapy increases the chance in both males with prostatic cancer and women when used for contraception or hormone replacement [16].

1.3.1. Age:

Every epidemiological study has found that gallstones are significantly more common as individuals age. Older individuals have a four to ten times greater number of gallstones than younger individuals do. The enzyme that limits the rate for the production of bile acids, cholesterol 7 hydroxylase, loses action with age, which causes a rise in biliary cholesterol concentration. [19] Age-related increases in deoxycholic acid in bile are explained by a rise in intestinal bacteria that dehydroxylates the fundamental bile acids. [20]

1.3.2. Oral contraceptives, Gender and Parity:

In all populations around the world, women are approximately twice as likely as men to develop cholelithiasis during their fertile years, regardless of the accumulated gallstone incidence. Even though there is less of a gender gap as people mature, postmenopausal women still experience this predominance to some extent. [21] Increased estrogen levels in the bile brought on by pregnancy, hormone treatment, or the use of conjunction irrational fear(estrogen-containing) hormonal contraceptives can result in gallstone formation by raising cholesterol levels in the bile and reducing gallbladder motion. [22]

1.3.3. Genetics:

Both necropsy and demographic lessons have revealed that racial modifications happen that are not only outstanding to environmental roots. [23]

1.3.4. Obesity and the distribution of body fat:

Gaining weight is a major indicator of gallstone disease, particularly in women. As 3 hydroxy 3 methyl glutaryl coenzyme A (HMGCoA) dehydrogenase activity increases, the likelihood of getting cholesterol gallstones increases. Young women are particularly vulnerable to the irrational fear impacts of the illness, and being thin protects against cholelithiasis, according to an epidemiological study. [24]

1.3.5. Speedy mass injury is viable:

Within a few weeks of beginning the shrinking treatments, 10 to 25% of people who experience significant weight loss develop gallstones and sludge. [25] Fast weight loss leads to increased cholesterol production and quick mobilization of the cholesterol that has been kept in adipose tissue. Gallbladder contraction is reduced by fasting and extremely low-fat diets, and gallbladder stasis encourages the growth of gallstones. Gallstone formation is avoided in people who are losing weight rapidly by accelerating gallbladder emptying with a small quantity of dietary fat. [26] Short-term cholesterol absorption in the gallbladder bile is increased by fasting, but over time, it promotes gallbladder stasis, which can result in the formation of sludge and ultimately gallstones. [27]

1.3.6. Diet:

Gallstone formation is closely correlated with dietary intake from the Western diet, which includes an increase in processed carbohydrates and a decrease in fiber. [28] It appears that calcium intake is negatively correlated with the probability of developing gallstones. [29] Calcium from the diet reduces cholesterol concentration in gallbladder bile by stopping the colon from reabsorbing extra bile acids. Ascorbic acid has been used to lower the prevalence of adult lithogenicity by affecting the performance of 7 hydroxylase in the bile. [30] Since intake raises enterohepatic bile acid circulation, it appears to be associated unfavorably with the development of gallstones. In addition to increasing cholecystokinin synthesis and gallbladder movement, coffee compounds also reduce cholesterol crystallization in bile [31], increase the absorption of fluid from the gallbladder, and possibly increase intestinal motility. [32]

1.3.7. Physical activity:

Regular physical activity also improves a number of metabolic risk factors linked to obesity, cholesterol gallstones, and better weight management. On the other hand, inactivity raises your chance of having a cholecystectomy. [33]

1.3.8. Drugs:

The blood cholesterol is reduced while the biliary cholesterol saturation is increased by all fibric acid compounds. The medication clofibrate significantly inhibits acyl CoA cholesterol acyltransferase in the liver. (ACAT). ACAT inhibition increases the likelihood that gallstones will form because it makes more free or irrational fear cholesterol accessible for bile release. [34] The relationship between proton pump inhibitors and altered gallbladder function may contribute to the formation of gallstones. [35] Ceftriaxone's lithogenic properties have already been addressed. [36,37]

1.3.9. Diabetes:

Triglycerides are a particular kind of fatty acid that are frequently linked in the general populace to diabetes. These fatty compounds could worsen gallstone formation. Gallbladder activity is compromised by diabetic neuropathy, and insulin-induced glucose appears to increase the lithogenic index. [38] Melatonin deficiency may increase the risk of gallbladder stones due to its capacity to reduce cholesterol discharge from the

gallbladder, increase cholesterol transfers to bile, and serve as an antioxidant to protect the gallbladder from oxidative stress. [39]

1.4. Clinical Symptoms of Gallstone Disease

Gallbladder disease can be conceptually likened to gallstones, despite the fact that gallstones are generally friendly with patients. [40] Gallstones typically cause no symptoms for their sufferers. [41] Action is typically not required for these "silent stones," as they are known. The most probable cause of recurrent episodes of right upper limb or epigastric irritation in patients with symptoms stones is a stone deformation in the cystic duct. [42] They may experience severe upper right side abdominal discomfort that lasts for 30 to several hours and is often accompanied by nausea and vomiting. The Boas sign, which describes discomfort among the shoulder blades or far below the right shoulder, may also be present. *Escherichia coli* and *Bacteroides* species almost always cause attacks after a very fatty dinner. Severe stomach pain, especially in the right upper quadrant, is followed by nausea, vomiting, fever, and leukocytosis when the gallbladder wall is inflamed. [43] because gangrene and rupture are rare outcomes, this condition may briefly improve without surgery. Indications of cholestasis are brought on by choledocholithiasis, a condition in which gallstones obstruct the common bile duct and settle there. [44] Jaundice can also be induced by a gall bladder stone or a cystic duct constricting the common hepatic duct, but this is the most prevalent way that it manifests itself. (Mirrizi syndrome). [45] Cholangitis can develop from any bile flow obstruction, no matter how minor. (infection of the bile ducts). Although they can be somewhat asymptomatic, conventional bile duct stones frequently cause severe damage to the right upper region or epigastrium. Acute pancreatitis can be exacerbated by common bile duct stones because they can block the ampulla of Vater, the major pancreatic duct next to the normal bile duct. [46]

1.5. Gallstones Diagnosis

The Boas sign and chronic episodes of right upper quadrant or epigastric pain are typically used to identify this condition. Right costal arch sensitivity when tapped (Ortner's sign) and right upper quadrant sensitivity with or without Murphy's sign are usual clinical symptoms. Oral cholecystography, nuclear scanning (cholescintigraphy), and ultrasonography are the three main methods for diagnosing gallbladder illness.

Ultrasonography is currently arguably the most helpful technique for diagnosing cholelithiasis and cholecystitis. Regular X-rays will occasionally show gallstones. With a 90% high accuracy and sensitivity rate, ultrasonography can identify stones as small as 2 mm in diameter. [47] When coupled with one of the numerous radioactive HIDA (iminodiacetic acids), such as (hepatic iminodiacetic acid) or DISIDA (disopropyl iminodiacetic acid), that are administered into the bile ducts, the short-lived isotope technetium 99 m might offer practical data surrounding gallbladder spasm. It can monitor overall bile duct obstruction, but it cannot provide anatomical details or tell apart gallstones. It allows a patient with probable acute cholecystitis to quickly investigate the function of their gallbladder. The gallbladder and bile ducts are scanned using the gamma radiation that the tracer emits. [48]

1.6. Gallstones Treatment

Whether or not there are signs, various approaches are taken to treating gallstones. The most common reason for gallstone treatment is episodes of upper abdominal discomfort that recur frequently. Stopping until there have been numerous instances of pain before having a cholecystectomy results in a slight reduction in lifespan [49]. [50] Despite the fact that almost all patients experience signs, prophylactic cholecystectomy for gallstones has been recommended in some populations, including infants. [51] As elective cholecystectomy is much healthier in this group than emergency cholecystectomy, it is also recommended for sickle cell disease patients who have gallstones because they can mirror the signs and symptoms of a sickle cell crisis. [52] Due to a greater likelihood of symptomatic gallstones associated with rapid weight reduction, cholecystectomy for cholelithiasis is infrequently performed simultaneously with surgery for morbid obesity. [53]. Some doctors recommend unintentional cholecystectomy for cholelithiasis in patients having other abdominal surgeries. [54] Prophylactic cholecystectomy is also advised in high-risk patients to avoid liver cancer. They included Native Americans with gallstones, people with long-term stones, stones larger than 3 centimeters in diameter, and people with gallbladders with calcified walls, also known as "porcelain" gallbladders. [55] For diabetic individuals with gallstones, prophylactic cholecystectomy was suggested due to the elevated risk of acute cholecystitis and mortality from immediate cholecystectomy. As opposed to diabetes mellitus, the risk of cardiovascular disease and other concurrent

illnesses is linked to diabetic patients' higher surgical risk with both planned and urgent gallbladder operation [56]. [57] Patients with diabetes who do not exhibit gallstone signs should not undergo a cholecystectomy. The gold standard of gallstone treatment was surgical cholecystectomy before laparoscopic cholecystectomy became available. [58]

Chapter 2

Purpose of the study

2.1 The objective of the study:

Gallstones are believed to form as a result of a disparity in the bile's chemical composition within the liver. The majority of the time, when bile's cholesterol content is too high, the extra cholesterol crystallizes into stones. Gallstones are quite typical. The purpose of this survey mentioned following points:

The project's intentions are to get a thorough considerate of the medical subject under exploration.

- To adjust the features that leading to gallstone creation.
- To expansion information of the many diagnostic methods used to diagnose this ailment.
- To acquire a comprehensive clasp of the condition, comprising the cause, signs and symptoms, effects, and medical and nursing supervision.
- To permit on acquaintance and proficiency to juniors and seniors.
- To realize well about present gallstone ailment situation in Bangladesh.

Chapter 3

Methodology

3.1. Setting and Participants

A big or small proportion of project participants, consumers, and/or stakeholders may be surveyed to collect a wealth of quantitative and qualitative data.

- I have started work for this survey in January 2023
- A survey created using a questionnaires' was being circulated on face to face individually.
- Some important data has been collected by reviewed number of related article paper from different website like google scholar, research gate and PubMed.

3.2. Sample size

The test had 15 short-answer questions and took roughly four to five minutes to finish. The survey includes the following information: (1) prologue; (2) sociosegment statistics (age, gender, instructional level, and occupation status); and (3) Gallstones roots and impact.

I have tried my best to collect all data from different profession people for gathering different types of information.

The examination is led by a questionnaires oriented survey, around 200 populations was being responded for this assessments.

3.3. Evidence collection way

The critical evidence was congregated through an online poll as the up close and personal meeting. We sent the connection planned google form to various gatherings of expert personalities randomly and the fusion guidelines were having at any rate one individual somewhere in the range of 18 and 55 years. Members were given no financial inspiration, and secrecy was kept up to certify information classification.

3.4. Statistical analysis:

Data analysis is the methodical application of statistical and/or logical tools for describing and illustrating, condensing and summarizing, and evaluating data. Microsoft Excel was used to analyses the data.

Chapter 4

Results & Discussion

4.1 Results & Discussion of Age

a) Result:

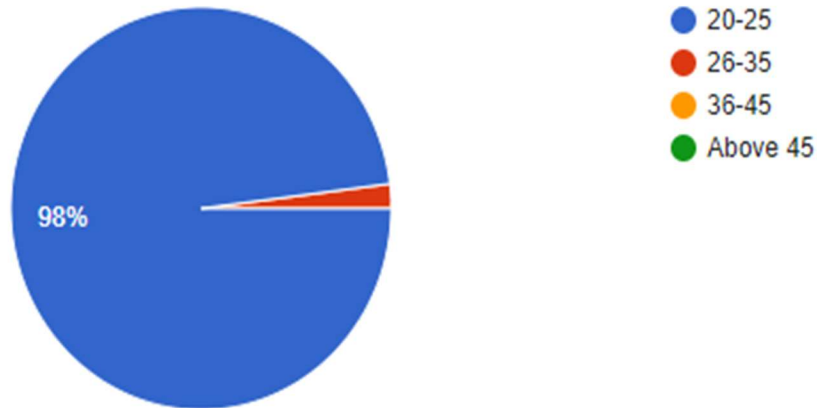


Figure 1: Results of age

b) Discussion:

The respondents' typical age extended from 20 to 25 years old (98%)

4.1.1 Gender

a) Results

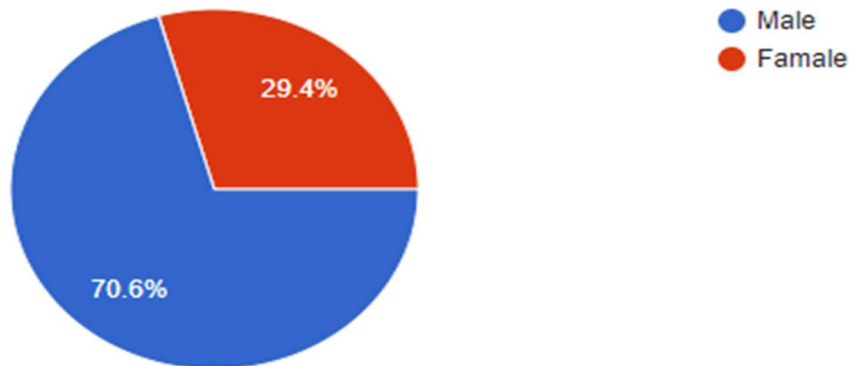


Figure 2: Result of gender

b) Discussion:

A whole of 210 entities proficient the online survey. There were 200 people who responded to the question about their salutation, with 29.4 percent of them being female and 70.6 percent being male.

4.2 People affected by gallstones disease

Have you ever been affected with gallstones?

a) Results

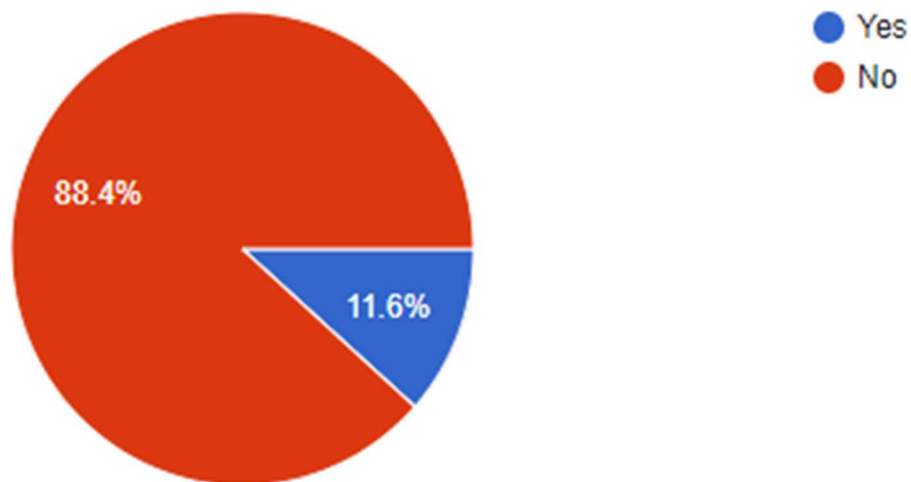


Figure 3: People affected by gallstones disease

b) Discussion

Gallstone ailment is the most numerous form of the biliary system, which conveyances bile in the body. Gallstones are pebble-like solid masses that arise in the gallbladder or bile duct. Gallstones sicknesses impacted 11.6 percent of the respondents, whereas 88.4 percent were unaffected.

4.3 Type of stones were formed

If yes; what type of stones were formed?

a) Results

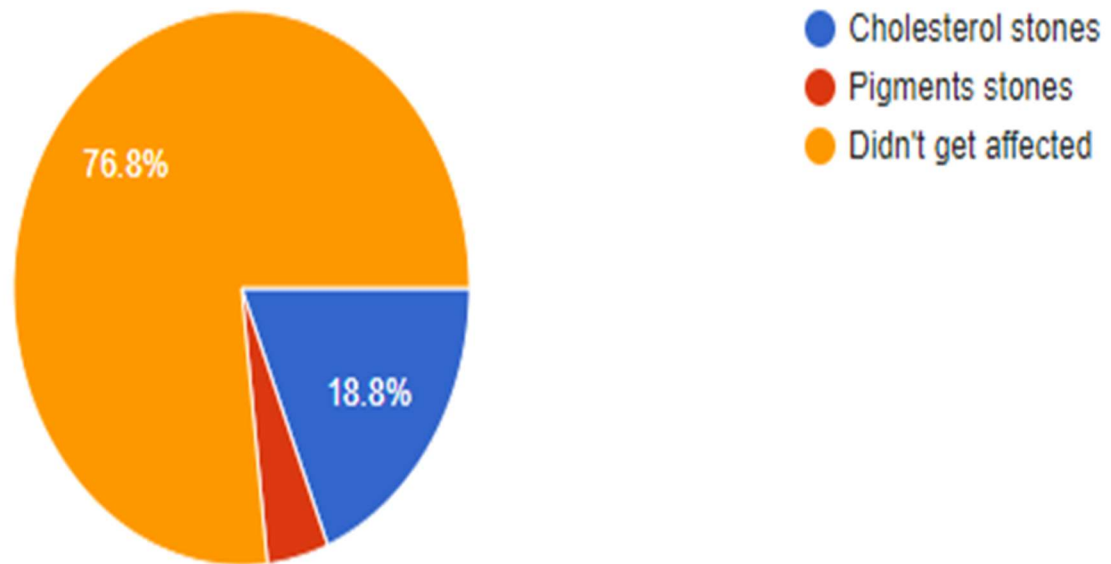


Figure 4: Type of stones were formed

b) Discussion

assessment expressions that 18.8% people who have gallstones ailment have cholesterol stones & pigments stones 4.3 % people, whereas 76.8 percent were unaffected.

4.4. People's idea about Diagnosis of gallstones

How do you think gallstones are usually diagnosed?

a) Results

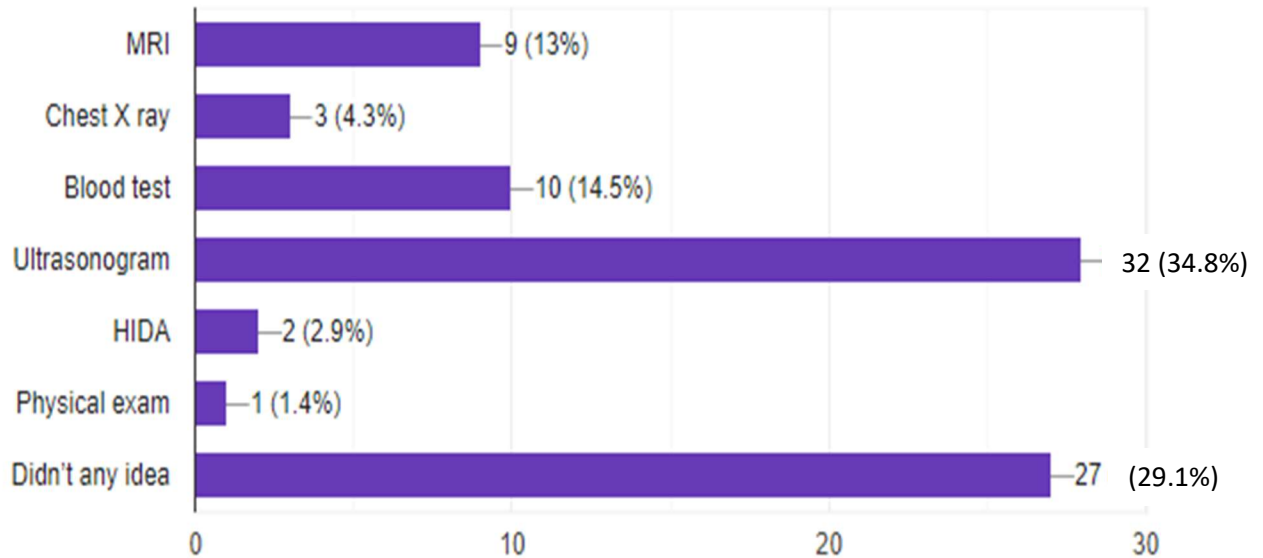


Figure 5: People's idea about Diagnosis of gallstones

b) Discussion

Investigations illustration that most people consider ultra-sonogram (40.6%) to be a diagnosis of Gallstone sickness.

4.5 Duration of Gallstones disease

When did you get Gallstone Disease?

a) Results

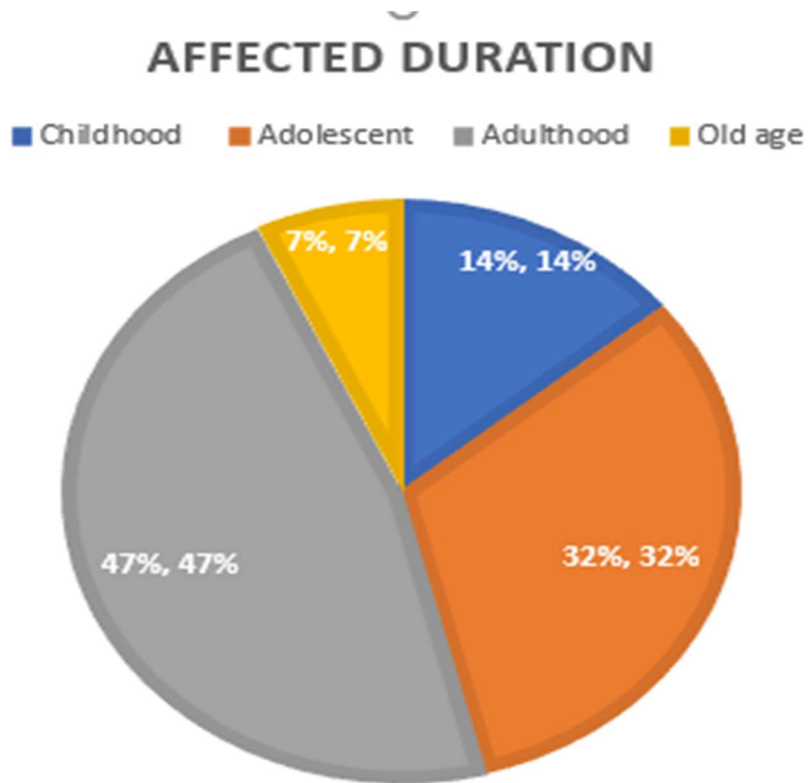


Figure 6: Duration of Gallstones disease

b) Duration

One of the questions in the investigation was when people were more affected by Gallstone Ailment. As seen in the assessment. It was greatest common in adulthood (47%). The lowest incidence is in the elderly (7%).

4.6 The Age of the victim

How old were you when you had gallstone disease?

a) Results

Number of victims	The Age of the victims
3	1-12
5	13-19
13	20-45
1	46+

Table 1: The Age of the victim

b) Discussion

Gallstone disease is most mutual in adults. The analysis initiate that 13 people between the ages of 20 and 45 were supreme affected.

4.7 What kind of treatment did you receive

a) Results

Name of the treatments	Percentage of the patients
Took medicine	37%
surgical treatments	63%

Table 2: What kind of treatment did you receive

b) Discussion

Patients with gallstones consumption two types of medical services: medicine and surgical treatment. The investigation institute that surgical treatment was reserved by most people (63%).

4.8 The percentage of drug taken

If you have taken medicine, then which medicine did you take?

a) Results

Name of the medicine	Percentage
Ursodiol	33%
Chenodiol	34%
Actigall	5%
Reltone	4%
Urso forte	7%
Urso	12%
Chenodeoxycholic acid	5%

Table 3: The percentage of drug taken

b) Discussion

There are several categories of medicines for gallstone sickness. We can perceive by exploration that chenodiol & ursodiol have been used the most.

4.9 Symptoms of Gallstones disease

How have you understood your problem? what kinds of symptoms you felt?

a) Results

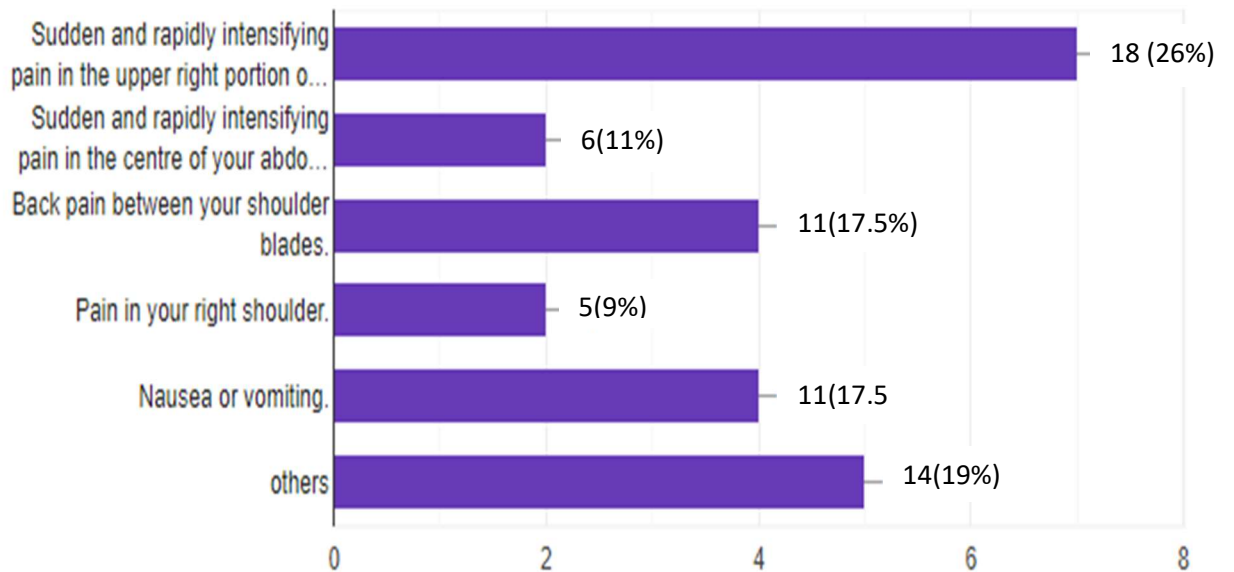


Figure 7: Symptoms of Gallstones disease

b) Discussion

One of the questions in the survey was how people with gallstone disease came to understand that they had the disease and what symptoms they had. The survey found that they were able to recognize their illness by observing a number of symptoms, notably 1. Sudden & rapidly intensifying pain in the upper right portion (43.8%). 2. back pain Between your shoulder (25%). 3. Nausea & vomiting (25%).

4.10 Duration of taking medicine

How long have you been taking medicine?

a) Results

Duration of taking medicine	Percentage
1 month	45%
3 month	33%
6 month	17%
1 years	5%

Table 4: Duration of taking medicine

b) Discussion

The inspection institute that 45% of patients took medication for one month, 33% of patients took medication for three months, 17% of patients took medication for 6 months & 5% of patients took medication for one year.

4.11 Felling's after surgery

If you have had surgery, then how do you feel now after the operation

a) Results

Felling's after surgery	Percentage
Feel hazy or groggy	35%
Felling better	33%
Routinely go to the doctor	17%
weakness	15%

Table 5: Felling's after surgery

b) Discussion

The inspection institute that 35% of patients felt hazy or groggy after surgery, 33% of patients felt better after surgery, 17% of patients routinely go to the doctor after surgery & 15% of patients felt weakness after surgery.

4.12 Frequency of doctor visit

what is your doctor visit frequency nowadays?

a) Results

Doctor visit	Percentage
7 days	3%
10 days	11%
15 days	16%
1 month	22%
6 month	45%
1 years	3%

Table 6: Frequency of doctor visit

b) Discussion

The inspection institute that 3% of patients visit doctor after 7 days, 11% of patients visit doctor after 10 days, 16% of patients visit doctor after 15 days, 22% of patients visit doctor after 30 days, 45% of patients visit doctor after 6 month & 3% of patients visit doctor after 1 year.

4.13 Precautions after surgery

What kind of precautions do you have to follow after the surgery?

a) Results

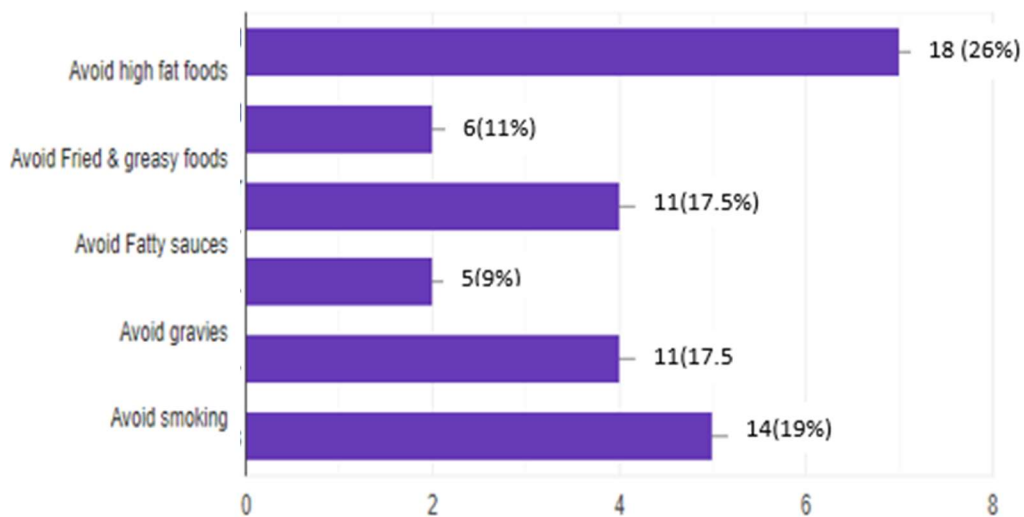


Figure 8: Precautions after surgery

b) Discussion

One of the question implants in the survey was asked what kind of precaution was taken after the surgery. Notable among many types of precautions they taken 1. 58.85% patients avoid smoking after surgery as a precaution. 2. 58.85% patients avoid fatty sauces after surgery as a precaution. 3. 41% patients avoid high fat foods after surgery as a precaution.

4.14 Taken rest after surgery

How long have you been at rest after surgery?

a) Results

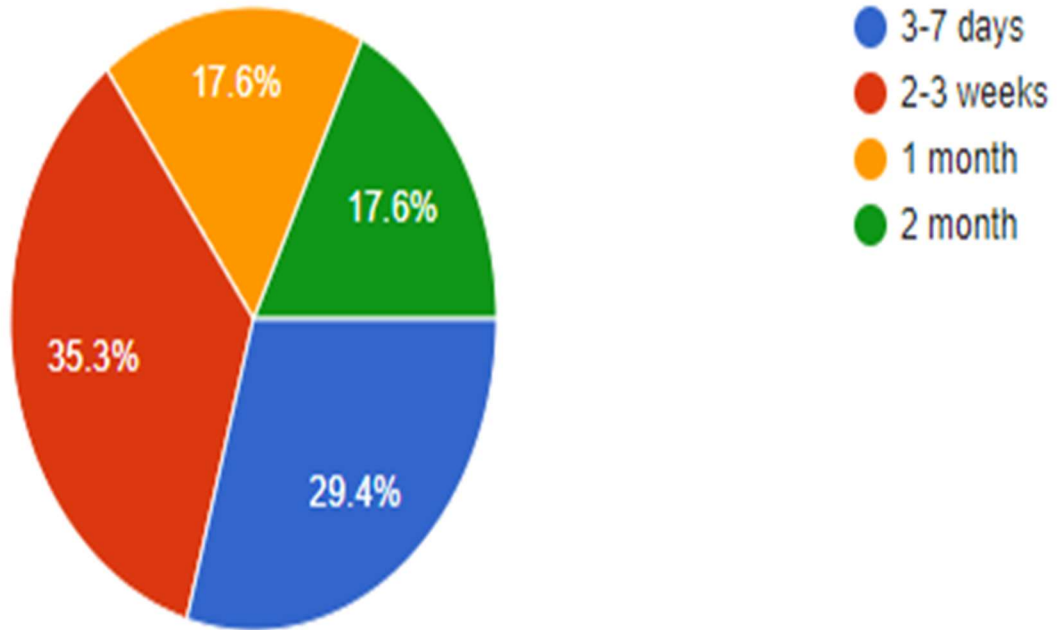


Figure 9: Taken rest after surgery

b) Discussion

According to the inspection, 35.3 percent of patients took a rest period of two to three weeks following surgery, 29.4 percent had a rest period of three to seven days, 17.6 percent received a rest period of one month, and 17.6 percent took a rest period of two months.

4.15 Side effect after surgery / having medicines

What are the difficulties now you feel after surgery / having medicines?

a) Results

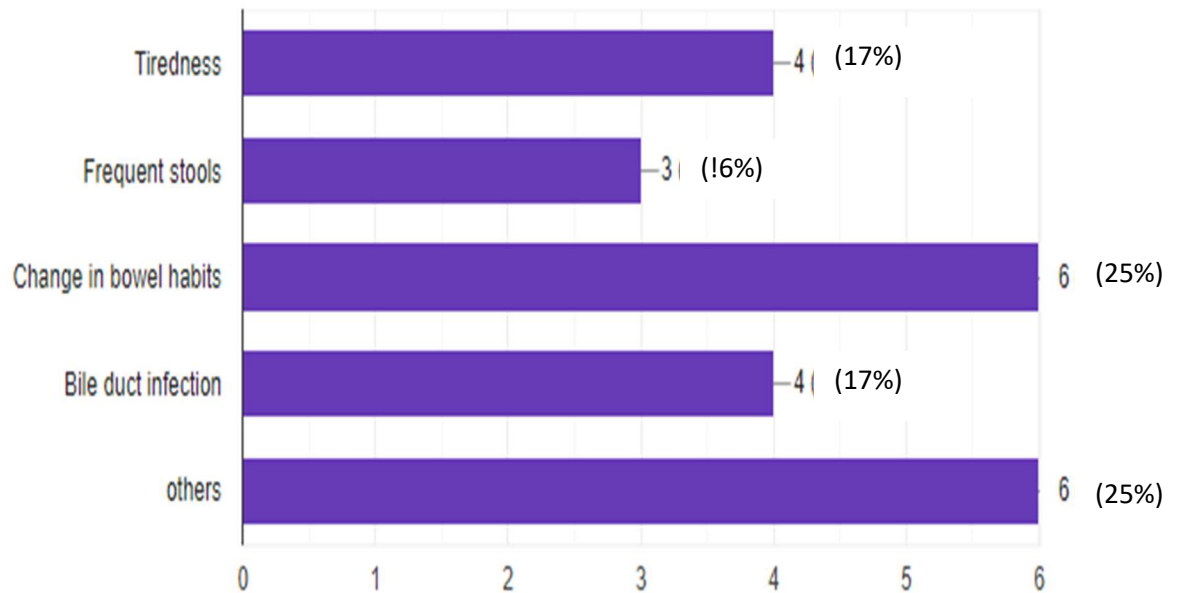


Figure 10: Side effect after surgery / having medicines

b) Discussion

Investigation exerts that numerous side effects after surgery/ having medicine. Notable among many types of side effects they felt 35.3% change in bowl habits after surgery/ having medicine, 17.6% patients felt frequent stool after surgery/ having medicine & 23.5% patients felt bile duct infection after surgery/ having medicine.

4.16 Surgical treatment or medicine seems to be more convenient for gallstones remover

a) Results

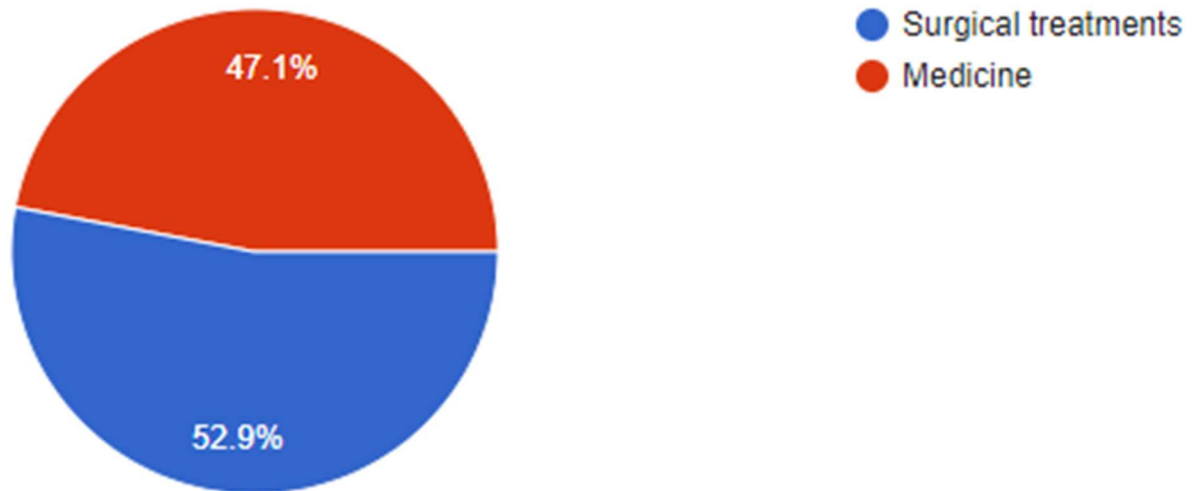


Figure 11: Surgical treatment or medicine seems to be more convenient for gallstones remover

b) Discussion

One of the question implants in the survey was asked which treatments like Surgical treatment or medicine seems to be more convenient for gallstones remover. Investigation exerts that 52.9% individuals thought Surgical treatment to be more convenient for gallstones remover. On the other hand, 47.1% thought that medicine be more convenient for gallstones remover

Chapter 5

Conclusion

5.1. Conclusion

The most common cause of liver disease is gallstones. Gallstones typically have no symptoms, whereas some other conditions may progress to clinical illness. Gender, ethnicity, past medical conditions, family background, and diet and nutrition are all factors that may increase the risk of gallbladder disease exposure. Gallstone disease is diagnosed using imaging techniques. The accuracy of these diagnostic methods varies, and they have pros and disadvantages. One attitude may be mentioned over another depending on the sort of gallbladder disease or the symptoms that are currently present. Asymptomatic people rarely need to behave, in the best instances. Surgery is an especially common procedure, but there are noninvasive options for those who cannot or do not wish to have surgery. By informing patients about the risk factors and how risk can be reduced by proper nutrition, diet, and exercise, pharmacists can help in the treatment of gallstones illness.

Chapter 6

Reference

Reference

1. Channa NA, Khand FD, Khand TU, Leghari MH, Memon AN. Analysis of human gallstone by fourier transform infrared (FTIR). *Pak J Med Sci* 2007;23:546 50.
2. Bouchier TA. Gallstones. *Proc R Soc Med* 1977;70:597 9.
3. Berci G. Historical overview of surgical treatment of biliary stone disease. In: MacFadyen BV, Arregui M, Eubanks S, Olsen DO, Peters JH, Soper NJ, et al., editors. *Laparoscopic Surgery of the Abdomen*. New York: Springer; 2004. p. 139 42.
4. Gordon Taylor G. On gallstones and their sufferers. *Br J Surg* 1937;25:241 51.
5. Hadidy S, Turki J, Misri HT. Cholelithiasis in the Syrian population. A prospective study of 189 patients. *Am J Surg* 1987;153:392 3.
6. Sampliner RE, Bennett PH, Comess LJ, Rose FA, Burch TA. Gallbladder disease in pima indians. Demonstration of high prevalence and early onset by cholecystography. *N Engl J Med* 1970;283:1358 64
7. Acalovschi M. Cholesterol gallstones: From epidemiology to prevention. *Postgrad Med J* 2001;77:221 9.
8. Biss K, HO KJ, Mikkelson B, Lewis L, Taylor CB. Some unique biologic characteristics of the Massai of East Africa. *N Engl J Med* 1971;298:694 9.
9. Onuigbo WI. A biopsy study of gallstones in Nigerian igbos. *Digestion* 1977;15:353 5.
10. Halldestam I, Enell EL, Kullman E, Borch K. Development of symptoms and complications in individuals with asymptomatic gallstones. *Br J Surg* 2004;91:734 8.
11. RahmanGA. Cholelithiasis and cholecystitis: Changing prevalence in an African community. *J Natl Med Assoc* 2005;97:1534 8.
12. Shaffer EA. Gallstone disease: Epidemiology of gallbladder stone disease. *Best Pract Res Clin Gastroenterol* 2006;20:981 96.

13. Dray X, Joly F, Reijasse D, Attar A, Alves A, Panis Y, et al. Incidence, risk factors, and complications of cholelithiasis in patients with home parenteral nutrition. *J Am Coll Surg* 2007;204:13 21.
14. Thistle JL, Cleary PA, Lachin JM, Tyor MP, Hersh T. The natural history of cholelithiasis: The National Cooperative Gallstone Study. *Ann Intern Med* 1984;101:171 5.
15. Friedman GD, Raviola CA, Fireman B. Prognosis of gallstones with mild or no symptoms: 25 years of follow up in a health maintenance organization. *J Clin Epidemiol* 1989;42:127 36.
16. Duane WC. Pathogenesis of gallstones: Implications for management. *Hosp Pract* 1990;25:65 76, 79.
17. Donovan JM, Carey MC. Physical chemical basis of gallstone formation. *Gastroenterol Clin North Am* 1991;20:47 66.
18. Apstein MD. Pathophysiology of gallstones and other diseases of the biliary tract. In: Chopra S, May RJ, editors. *Pathophysiology of Gastrointestinal Diseases*. Boston: Little, Brown; 1989. p. 489 528.
19. Holzbach RT, Busch N. Nucleation and growth of cholesterol crystals. Kinetic determinants in supersaturated native bile. *Gastroenterol Clin North Am* 1991;20:67 84.
20. Beckingham IJ. Gallstone disease. *Br Med J* 2001;322:91 4.
21. Channa NA. Gallstone disease: A review. *Pak Armed Forces Med J* Issue Year: 2008; Issue Number: 2 Issue Month: June.
22. Trotman BW. Pigment gallstone disease. *Gastroenterol Clin North Am* 1991;20:111 26.
23. Small DM. Part I. The etiology and pathogenesis of gallstones. *Adv Surg* 1976;10:63 85.
24. Kurtin WE, Schwesinger WH, Diehl AK. Age related changes in the chemical composition of gallstones. *Int J Surg Investig* 2000;2:299 307.

25. LaMont JT, Smith BF, Moore JR. Role of gallbladder mucin in pathophysiology of gallstones. *Hepatology* 1984;4:51S 6.
26. Trotman BW, Petrella EJ, Soloway RD, Sanchez HM, Morris TA 3rd, Miller WT. Evaluation of radiographic lucency or opaqueness of gallstones as a means of identifying cholesterol or pigment stones. Correlation of lucency or opaqueness with calcium and mineral. *Gastroenterology* 1975;68:1563 6.
27. Johnston DE, Kaplan MM. Pathogenesis and treatment of gallstones. *N Engl J Med* 1993;328:412 21.
28. Stewart L, Oesterle AL, Erdan I, Griffiss JM, Way LW. Pathogenesis of pigment gallstones in Western societies: The central role of bacteria. *J Gastrointest Surg* 2002;6:891 903.
29. Trotman BW, Bernstein SE, Bove KE, Wirt GD. Studies on the pathogenesis of pigment gallstones in hemolytic anemia: Description and characteristics of a mouse model. *J Clin Invest* 1980;65:1301 8.
30. Everson GT, McKinley C, Kern F Jr. Mechanisms of gallstone formation in women. Effects of exogenous estrogen (Premarin) and dietary cholesterol on hepatic lipid metabolism. *J Clin Invest* 1991;87:237 46.
31. Yio XY, Jin BW, Yin FZ, Li XJ. Bile secretory immunoglobulin A in biliary infection and cholelithiasis. *Gastroenterology* 1992;102:1000 8.
32. Strasberg SM, Toth JL, Gallinger S, Harvey PR. High protein and total lipid concentration are associated with reduced metastability of bile in an early stage of cholesterol gallstone formation. *Gastroenterology* 1990;98:739 46.
33. CareyMC, CahalaneMJ. Whither biliary sludge? *Gastroenterology* 1988;95:508 23.
34. Lee SP, Nicholls JF, Park HZ. Biliary sludge as a cause of acute pancreatitis. *N Engl J Med* 1992;326:589 93.

35. Maringhini A, Marcenò MP, Lanzarone F, Caltagirone M, Fusco G, Di Cuonzo G, et al. Sludge and stones in gallbladder after pregnancy. Prevalence and risk factors. *J Hepatol* 1987;5:218-23.
36. Messing B, Bories C, Kunstlinger F, Bernier JJ. Does total parenteral nutrition induce gallbladder sludge formation and lithiasis? *Gastroenterology* 1983;84:1012-9.
37. Liddle RA, Goldstein RB, Saxton J. Gallstone formation during weight reduction dieting. *Arch Intern Med* 1989;149:1750-3.
38. Bolondi L, Gaiani S, Testa S, Labò G. Gall bladder sludge formation during prolonged fasting after gastrointestinal tract surgery. *Gut* 1985;26:734-8.
39. Shiffman ML, Keith FB, Moore EW. Pathogenesis of ceftriaxone associated biliary sludge: In vitro studies of calcium ceftriaxone binding and solubility. *Gastroenterology* 1990;99:1772-8.
40. Lopez AJ, O'Keefe P, Morrissey M, Pickleman J. Ceftriaxone induced cholelithiasis. *Ann Intern Med* 1991;115:712-4.
41. Moore EW. Biliary calcium and gallstone formation. *Hepatology* 1990;12:206S-14.
42. Gleeson D, Hood KA, Murphy GM, Dowling RH. Calcium and carbonate ion concentrations in gallbladder and hepatic bile. *Gastroenterology* 1992;102:1707-16.
43. Everson GT. Gallbladder function in gallstone disease. *Gastroenterol Clin North Am* 1991;20:85-110.
44. Gray M, Jacobson T. Are somatostatin analogues (octreotide and lanreotide) effective in promoting healing of enterocutaneous fistulas? *J Wound Ostomy Continence Nurs* 2002;29:228-33.
45. Tsai CJ, Leitzmann MF, Hu FB, Willett WC, Giovannucci EL. Frequent nut consumption and decreased risk of cholecystectomy in women. *Am J Clin Nutr* 2004;80:76-81.

46. Morán S, Uribe M, Prado ME, de la Mora G, Muñoz RM, Pérez MF, et al. Effects of fiber administration in the prevention of gallstones in obese patients on a reducing diet. A clinical trial. *Rev Gastroenterol Mex* 1997;62:266 72.
47. Marcus SN, Heaton KW. Effects of a new, concentrated wheat fibre preparation on intestinal transit, deoxycholic acid metabolism and the composition of bile. *Gut* 1986;27:893 900.
48. Hayes KC, Livingston A, Trautwein EA. Dietary impact on biliary lipids and gallstones. *Annu Rev Nutr* 1992;12:299 326.
49. Schwesinger WH, Kurtin WE, Page CP, Stewart RM, Johnson R. Soluble dietary fiber protects against cholesterol gallstone formation. *Am J Surg* 1999;177:307 10.
50. Vázquez MC, Rigotti A, Zanlungo S. Molecular mechanisms underlying the link between nuclear receptor function and cholesterol gallstone formation. *J Lipids* 2012;2012:547643.
51. Shaper AG, Patel KM. Diseases of the biliary tract in Africans in Uganda. *East Afr Med J* 1964;41:246 50.
52. Owor R. Study of gallstones in Ugandan Africans. *East Afr Med J* 1971;48:193 5.
53. Lopis S. The incidence of cholelithiasis in the Bantu. *Clin Proc* 1947;6:338 47.
54. LuSN, ChangWY, WangLY, HsiehMY, ChuangWL, ChenSC, et al. Risk factors for gallstones among Chinese in Taiwan. A community sonographic survey. *J Clin Gastroenterol* 1990;12:542 6.
55. Al Mofleh IA. Gallstones. *Saudi J Gastroenterol* 1995;1:173 9
56. Attasaranya S, Fogel EL, Lehman GA. Choledocholithiasis, ascending cholangitis, and gallstone pancreatitis. *Med Clin North Am* 2008;92:925 60, x
57. Kratzer W, Kächele V, Mason RA, Hill V, Hay B, Haug C, et al. Gallstone prevalence in Germany: The Ulm gallbladder stone study. *Dig Dis Sci* 1998;43:1285 91.
58. Paumgartner G, Gerok W, Bertolotti M, Bertolotti S, Menozzi D. Ageing and bile acid metabolism: Studies on 7 α hydroxylation of cholesterol in humans. In: Paumgartner.