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Laparoscopic cholecystectomy during pregnancy

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Abstract---*Laparoscopic cholecystectomy is the definitive treatment method for treatment of symptomatic gallstone disease. Pregnancy is a prolithogenic state; estrogen increases cholesterol production, whereas progesterone reduces bile acid secretion and inhibits gallbladder emptying. Thus, the most common causes of gall bladder disease in pregnancy are gall stones and biliary sludge. The aim of the present study was to evaluate the correlation between correlations of cesarean section pregnancy surgery with laparoscopic cholecystectomy. In the present study, the female patients (n=100) visited to the Al- Shafa Hospital Diyala/ Iraq during July 2018 to July 2019 were enrolled. The ages of the pregnant women were 20 to 36 years. Before surgery, the red blood cells, white blood cells and serum urea were found to be 104.57±2.91; 12658.0±1674.4 and 33.48±0.47, respectively. After surgery, the red blood cells, white blood cells and serum urea were found to be 221.9±10.91; 10183.9±1053.6 and 34.94±0.44, respectively (Table 2).*

Keywords---*Laparoscopic cholecystectomy, Cesarean section surgery, Gall bladder disease*

I. Introduction

Bile is a fluid produced by the liver and helps in digestion after its release in the small intestine. Various factors such as diet, hormonal levels, medications, rapid changes in weight leads to development of solid particles of bile and termed as gallstones. Drift of these gallstones outside the gallbladder may block the normal flow of bile and develops inflammation and infection of the gallbladder resulting into cholecystitis. Symptoms of cholecystisis includes sharp, constant abdominal pain, fever, nausea and vomiting (Kim et al., 2018). The most commonly used approach in the treatment of acute cholecystitis (AC) is administration of conservative therapy. Conservative therapy helps in avoiding the possible complications associated with inflammation upto 6 to 8 weeks. Literature suggest that about 70% of patients respond to conservative treatment within the first 24 to 48 hours; still laparoscopic cholecystectomy is the definitive treatment modality used in the treatment of symptomatic gallstone disease (Acar et al., 2017). Laparoscopic cholecystectomy is done using the camera which is inserted through 4 small incisions into the abdomen for visualization. Under anesthesia, gallbladder is removed to get rid of gallstones. Thus, the procedure is also termed as minimally invasive cholecystectomy (Kim et al., 2018).

With an incidence rate of 10-15%; gallstones occurrence is more typical in women than men. The most common reason for higher incidence of gallstones disease in women is because of pregnancy. During pregnancy, changes in estrogen levels increases cholesterol production. On the other hand, progesterone concentration decreases the bile acid secretion and therby restricts gallbladder emptying (Nasioudis et al., 2016). Taken together, such situation in pregnancy leads to formation of

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gallstones and accumulation of biliary sludge resulting into development of gall bladder disease. Approximately 0.05%–0.3% of women in pregnancy develops gallbladder disease among which 3.5%–10% display asymptomatic gall stones. Thus, acute cholecystitis is observed during pregnancy with an estimated incidence of 0.1% (Gilo et al., 2009).

Considering the higher occurrence in pregnant women, cholecystectomy is often combined with cesarean section procedure to avoid repeated hospitalization and surgery. Cesarean section is one of the most well-known systems in women of conceptive age. Apart from cholecystectomy, earlier reports suggests combining of gynaecological procedures, hernia repair and appendectomy with cesarean section (Mushtaque et al., 2012).

Thus, the combination of cholecystectomy with gynaecologic surgery or cesarean section is advantageous in terms of cost, convenience and reduced trauma to patient. It also prevents the possibility of developing acute cholecystitis while the patient is waiting for cholecystectomy (Akyurek et al., 2005). With this background, the aim of the present study was to evaluate the correlation between cesarean section pregnancy surgery with laparoscopic cholecystectomy.

II. Material and methods

Patient enrollment

In the present study, the pregnant women patients (n=100) visited to the Al- Shafa Hospital Diyala/ Iraq hospital during July 2018 to July 2019 were enrolled.

Operative procedure

All operations are done under general anesthesia, in supine position and insufflation with CO_2 by using veres needles or hason method in patient with complicated previous abdominal surgery. The calot triangle along with identification and clippings of both cystic artery and duct were dissected in the surgery.

Blood collection

The blood was collected for the various biochemical assays such as hematogram analysis and serum urea by commercially available kits.

Statistical analysis

Results were presented as mean ± standard error (SE). Dunnett multiple comparison test and one way analysis of variance (ANOVA) was done to estimate the statistical significance.

III. Results

In the present study, we examined the pregnant women (n=100) visited to Al- Shafa Hospital Diyala/ Iraq during July 2018 to July 2019 period. The age group of the patients was 20 to 36 years.

Before surgery, the red blood cells, white blood cells and serum urea were found to be 104.57±2.91; 12658.0±1674.4 and 33.48±0.47, respectively. After surgery, the red blood cells, white blood cells and serum urea were found to be 221.9±10.91; 10183.9±1053.6 and 34.94±0.44, respectively (Table 2).

Table 2: Blood biochemistry parameters before and after laparoscopic cholecystectomy surgery

Blood parameter	Before	After

Red Blood Cells	104.57±2.91	221.9±10.91
White Blood Cells	12658.0±1674.4	10183.9±1053.6
Serum Urea	33.48±0.47	34.94±0.44

IV. Discussion

Various studies worldwide has been evaluated the feasibility and the results of cholecystectomy at the time of cesarean section. In a study by Mushtaque et al. (2012), cholecystectomy combined with lower segment cesarean section was performed under anesthesia in 32 patients. Overall, the combined procedure did not display any intraoperative or postoperative complications. Also, patients were discharged on the 5th–7th day after operation with routine medication (Mushtaque et al., 2012). Our study is in accordance with these reports. In another study, laparoscopic cholecystectomy has been performed in a 30-year-old pregnant woman (week 38 of gestation) wherin same incision of cesarean section was used (Surgit et al., 2016). The patient was discharged without any problems. Thus, use of the cesarean incision is advantageous for treatment of gallbladder surgery as it helps in minimizing the risk of port related injury and reducing postoperative pain (Surgit et al., 2016).

Hirohata et al., 2019 reported a case of an 86-year-old man with acute upper abdominal pain wherin a laparoscopic cholecystectomy was performed using optimal port site. This approach is found to be flexible for treatment of acute cholecystitis as the patient was discharged in 5 days after surgery without postoperative complications. In a study by Kosmidis et al., 2013 reported that in all cases, similar results with no complications was observed (Hirohata et al., 2019). In accordance with this study, our study also displayed increase in the blood hematological count, *i.e.* RBC and serum urea after laparoscopic cholecystectomy surgery.

In an alternative approach, laparoscopic cholecystectomy has been performed in a 30-year-old pregnant woman through trocar cannulas inserted directly through the same incision used for the cesarean section, without the need for additional incisions elsewhere (Surgit et al., 2016). In week 38 of gestation, under general anesthesia and with a standard Pfannenstiel incision, a cesarean section was successfully performed. Thereafter, a laparoscopic cholecystectomy was performed through the same incision. The patient was discharged without any problem. Thus, use of the cesarean incision alone, provides way for easy gallbladder removal while also minimizing the risk of port related injury, reducing postoperative pain and providing better cosmetic results due to the absence of additional incisions; therefore can be considered in selected patients (Surgit et al., 2016).

Gallstone disease in pregnancy display potential maternal and fetal morbidity because of disease and associated surgical treatment. Many a times, pregnant patients develops recurrent symptoms of disease. About 40% in the third trimester and 7% overall pregent women who has undergone cholecystectomy demonstrates preterm labor. Out of these, 0-18% has spontaneous abortion while is 0–22% of pregnant women have a preterm delivery depending on the severity of the underlying disease and gestational age (Mushtaque et al., 2012).

Although, it is a useful strategy of combining cesarean section with laparoscopic surgery in pregnant women; many surgeons do not prefer to perform laparoscopic procedures during the first and third trimester. Such operative management of disease is associated with risks such as fetal teratogenicity and spontaneous abortion. To support an operative mode of disease management, a systematic review of fifty-one studies in which laparoscopic cholecystectomy attempted in 590 pregnant patients depicted that 70.7% of the procedures were performed during the second trimester. Rate of intraoperative and postoperative complications were observed in the range of 3.5% and 4.0% of the study population. Overall, Laparoscopic cholecystectomy reported to be a safe alternative to open surgery during pregnancy (Nasioudis et al., 2016). In another approach of gallstone disease management is nonoperative where strategies are suggested to reduce severity of disease and

associated complications such as nausea, jaundice or pancreatitis (Nasioudis et al., 2016). Thus, it is necessary to decide over operative or non operative mode of gallstone disease management at earliest.

V. Conclusion

In the pregnant women, most common causes of gall bladder disease in pregnancy are gall stones and biliary sludge. The combination of the cholecystectomy and cesarean section will found to be efficient way to treat the above condition. After surgery, there is significant improvement in the hematological parameters and serum urea level.

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