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RISK FACTORS AFFECTING THE DEVELOPMENT OF EARLY POST CHOLECYSTECTOMY SYNDROME

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ABSTRACT

Background: Post Cholecystectomy Syndrome is commonly manifested as upper abdominal pain and dyspepsia. These symptoms return to different causes of biliary tract and non-biliary tract origin. **Aim of study:** To assess the incidence and the risk factors for development of post cholecystectomy syndrome after laparoscopic cholecystectomy. **Patients and Methods:** Randomized prospective study included 70 patients undergone elective laparoscopic cholecystectomy was conducted in the surgical unit, department of surgery, Al-Numan Teaching Hospital in Baghdad during a period of two years from Feb, 2017 – May, 2019. Patients diagnosed with malignancy and patients with incomplete information with respect to anthropometry, laboratory investigations, and ultrasound findings were excluded from the study. Preoperative and intraoperative variables were compared between those patients who developed PCS and those who didn't. **Results:** Out of 70 patients included, twelve with mean age of 41.4 ± 3.6 years were developed an early PCS with an incidence rate of 17.1%. The most common presenting symptoms was dyspepsia (75%). Prevalence of early PCS was significantly higher in patients with small gall stones, in patients with previous attacks of acute cholecystitis, and in patients with spillage of stones or bile. **Conclusion:** Post cholecystectomy syndrome is not uncommon condition in our local community in Iraq, the incidence rate is aligned with that worldwide. Spillage of stones, recurrent attacks of acute cholecystitis and small size of stones are considered as risk factor for developing post cholecystectomy syndrome.

KEYWORDS: Post cholecystectomy syndrome, risk factors, incidence rate, Iraq.

INTRODUCTION

Post cholecystectomy syndrome (PCS) is known as the recurrence of a complex group of heterogeneous symptoms similar to those experienced before a cholecystectomy. They commonly manifest as upper abdominal pain (primarily the right upper quadrant) and dyspepsia, with or without jaundice, and can be early, if occurring in the postoperative period, and late, if it manifests after months or years.[1] Laparoscopic cholecystectomy (LC) is the 'gold standard' operation for symptomatic gallstones, however, regardless of incredible accomplishment with the task, numerous patients stay symptomatic after cholecystectomy. As a result, when LC is recommended, many patients wonder about the relief of their symptoms and the occurrence of new symptoms after removing the GB.[2,3] Certainly, there is no clear-cut definition of PCS, and even disorders unrelated to the biliary tract are included if they cause symptoms after cholecystectomy;[4,5] given this, one can appreciate the difficulty in assigning an exact figure for its incidence. The incidence varies widely in the literature; it has been reported in many clinical studies to be between 5-15%, 5-30%, and 15-47% with 10-15% being the most reasonable range. The onset of symptoms may vary from 2 days to 25 years. Some authors reported the incidence of PCS in female patients as 43%, compared to 28% among male patients.[4,6] Because of the different causes of PCS, any patient presenting with any symptoms after removal of gallbladder needs symptomatic treatment and a detailed workup to diagnose the exact cause of these symptoms[7]; liver functions and abdominal ultrasonography are usually the first line of tests that are ordered, and further investigations like computed tomography (CT) scan, endoscopic retrograde cholangiopancreatography (ERCP), magnetic resonance cholangiopancreatography (MRCP), and upper gastrointestinal endoscopy that is tailored accordingly.[2,8] The most common reported biliary cause of PCS is ductal calculi, and the most common reported non-biliary cause is gastric/duodenal ulcer.[2] The management of the options for postcholecystectomy syndrome are focused on the treatment of the particular cause. Many articles reported different approaches to each etiology, which causes the syndrome to experience various success and morbidity rates. The recent advances in the laparoscopic and

endoscopic therapeutic options have led to a decrease in open exploration surgical methods.[9] The presence of gastrointestinal diseases as bloating or irritable bowel syndrome[10] rather than the original gallbladder disease, was also related to the persistence of PCS. Patients with psychiatric medication, personality disorders, psychological problems, and neuroticism showed poor results.[11,12] Patients with poor results after cholecystectomy also showed decreased compliance, which confuses the viability of management. Therefore, a method for predicting outcomes and factors related to poor outcomes is necessary in the clinical setting. Post cholecystectomy syndrome is under-reported in Iraq, despite the high prevalence of gallbladder stones, diseases, and complications. Therefore, we aimed in this study to analyze the risk factors and evaluate the approach to the PCS in our local Iraqi community.

PATIENTS AND METHODS

Study Design and Setting: This is a randomized prospective study that was conducted in the surgical unit, department of surgery, Al-Numan Teaching Hospital in Baghdad during a period of two years from Feb, 2017 – May, 2019.

Study Population and sample size: The study population included patients who underwent LC during the study period, so the total number of included patients was 70. All patients were followed by (symptoms, investigation, and abdominal ultrasound) pre- and post-LC.

All cases were operated upon as elective cases; those patients with history of acute attack of cholecystitis were treated conservatively first and operated upon after at least six weeks of the attack with abdominal ultrasound confirming the subsiding of the acute inflammatory changes. Patients diagnosed with malignancy and patients with incomplete information with respect to anthropometry, laboratory investigations, and ultrasound findings were excluded from the study. Preoperative variables included patient demographics (Age and gender of the patient, Body Mass Index, presence of diabetes mellitus), ultrasound for abdomen findings as presence of stones and CBD diameter. Preoperative and intraoperative variables were compared between those patients who developed PCS and those who didn't. All patients were admitted to the surgical ward and prepared for LC one day before surgery. The operative findings and intraoperative complications were recorded and the patients were followed up for one month after discharging them. A standard technique for LC was practiced; nasogastric tube was not used routinely but occasionally. Following general anesthesia and positioning of the patient and draping, insufflation was achieved through a Veress needle. Carbon dioxide used as the insufflation gas. A 30 degrees' camera used through 10 mm port. Standard procedure was done through four ports technique, but three ports technique was also practiced.

Statistical Analysis

The data analyzed using Statistical Package for Social Sciences (SPSS) version 25. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Pearson's Chi–square test was used to assess statistical association between certain variables and prevalence of PCS. A level of p – value less than 0.05 was considered significant.

RESULTS

This study involved 70 patients who underwent LC. Twelve patients with mean age of 41.4 ± 3.6 years were developed an early PCS with an incidence rate of 17.1%.

The mean age of total patients was 46.4 ± 7.9 years; 77.1% were females and 47.1% were overweighed; 17.1% were diabetics; 30% showed spillage stone or bile; 41.4% had large stones; 15.7% had previous attacks of acute cholecystitis; 37% showed elevated WBC count; 18.6% had dilated CBD and 37.1% had spillage of stone or bile. (Table 1).

Table 1: Distribution of Study Patients by Certain Information.

Variable	No. (n=70)	Percentage (%)
Age (Years)		
< 40	13	18.6
40 - 49	26	37.1
≥ 50	31	44.3
Gender		
Male	16	22.9
Female	54	77.1
BMI level		
Normal	18	25.7
Overweight	33	47.1
Obese	19	27.2
DM		
Yes	12	17.1
No	58	82.9
Size of Stone		
Small	23	32.9
Medium to large	18	25.7
Large	29	41.4
Laboratory investigation		
Elevated WBC count	26	37.1
Elevated alkaline phosphatase	5	7.1
High bilirubin level	5	7.1
High serum amylase level	8	11.4
CBD		
Normal	57	81.4
Dilated	13	18.6
Recurrent attacks of acute cholecystitis		
YES	11	15.7
NO	59	84.3
Spillage of stones or bile		
Yes	26	37.1
No	44	62.9

Figure 1 shows the presenting symptoms of those with early PCS. We noticed that the most common presenting symptoms was dyspepsia (75%).

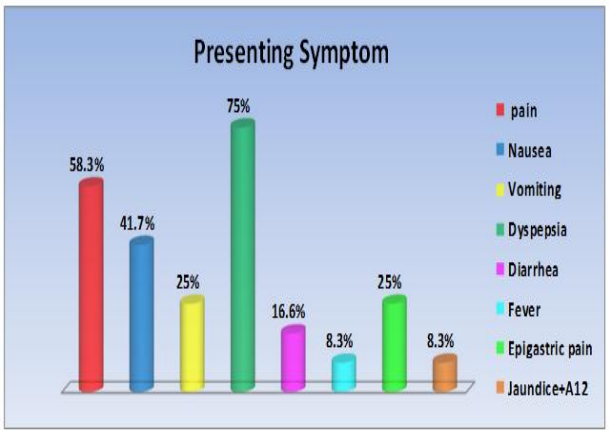

Figure 1: Presenting symptoms of those with early PCS.

In table 2, we noticed that prevalence of early PCS was significantly higher in patients with small gall stones (34.8%, P= 0.011), in patients with previous attacks of acute cholecystitis (54.5%, P= 0.001), and in patients with spillage of stones or bile (30.8%, P= 0.02).

No statistical significant association ($P \geq 0.05$) between development of early PCS and all other characteristics (age, gender, BMI level, DM, and common bile duct (CBD) diameter).

Table 2: Association of development of early PCS with certain information.

Variable	Early Post Cholecystectomy Syndrome Yes (%) n= 12	Total (%) No (%) n= 58	P - Value n= 70	
Age group (Years)				
< 40	2 (15.4)	11 (84.6)	13 (18.6)	**0.535**
40 - 49	3 (11.5)	23 (88.5)	26 (37.1)	
≥ 50	7 (22.6)	24 (77.4)	31 (44.3)	
Gender				
Male	3 (18.8)	13 (81.3)	16 (22.9)	**0.846**
Female	9 (16.7)	45 (83.3)	54 (77.1)	
BMI level				
Normal	3 (16.7)	15 (83.3)	18 (25.7)	**0.424**
Overweight	4 (12.1)	29 (87.9)	33 (47.1)	
Obese	5 (26.3)	14 (73.7)	19 (27.2)	
DM				
Yes	3 (25.0)	9 (75.0)	12 (17.1)	**0.427**
No	9 (15.5)	49 (84.5)	58 (82.9)	
Size of stone				
Small	8 (34.8)	15 (65.2)	23 (32.9)	**0.011**
Medium to large	3 (16.7)	15 (83.3)	18 (25.7)	
Large	1 (3.4)	28 (96.6)	29 (41.4)	
Previous attack of acute cholecystitis				
Yes	6 (54.5)	5 (45.5)	11 (15.7)	**0.001**
No	6 (10.2)	53 (89.8)	59 (84.3)	
CBD				
Normal	8 (14.0)	49 (86.0)	57 (81.4)	**0.14**
dilated	4 (30.8)	9 (69.2)	13 (18.6)	
Spillage of stones or bile				
Yes	8 (30.8)	18 (69.2)	26 (37.1)	**0.02**
No	4 (9.1)	40 (90.9)	44 (62.9)	

DISCUSSION

In World literatures, the incidence of PCS varies widely, between 5% and 63%[13] but despite the large number of LC being performed in Iraq, there is little information on the incidence, clinical presentation and risk factors of PCS. The incidence rate of the PCS in this study was 17.1%, which is in line with the average reported rates in number of studies worldwide as in studies conducted in Saudi Arabia 2018 (19%)[1], in India 2013 (27%).[14] A possible explanation for PCP is that intraoperative

damage to nerves innervating visceral structures during the operation causes postoperative pain.[15] There are conflicting reports in the studies about risk factors that contribute to the development of PCS.[5 8,16] In the current study, there was no statistically significant association between early PCS symptoms and age, gender and BMI; despite that the incidence is higher in females and this might be occurred because more females undergone cholecystectomy (1:3.37 male to female ratio in the present study) but this does not translate into a 'risk' factor for developing early PCS; these results were in agreement with findings of studies conducted in India 2018[2] and in Norway 2012.[16]

We found in this study that the symptoms post cholecystectomy increase in patient who had history of recurrent attach of acute cholecystitis which is in consistent with Arora et al study 2018[2] and the mechanism might be explained by the theory of referred pain from the gallbladder (which can persist for years due to central neuroplastic changes), continuing or manifesting post-operatively.[17] The other constant factor for the development of PCS in our series was the presence of spillage of stone or bile, Zorluoglu et al 2007 study of implanted gall stones inside the peritoneal cavity of the rats in combination with either sterile bile or infected bile, and they came to the conclusion that the combination of multiple stones and infected bile increased the incidence of adhesions and intra-abdominal abscesses.[18] In this study, we found that the size of the stones plays a role in developing symptoms post-cholecystectomy, but we didn't find any previous study in other researches confirming that the size of stones as a risk factor for developing PCS.

The presenting signs and symptoms in this study were similar to those reported internationally as findings of studies conducted by Jaunoo SS et al 2010[8], by Fillip M et al 2009[19], by Kim Gi Hyun et al 2014[12], and by Lambert MP et al 2013.[20] We observed that most of the patients presented with only one or two findings (mostly dyspepsia (75%) and pain in the right upper quadrant (58.3%)), however, no one presented with all or multiple complaints. In general, many of the other symptoms were vague and general which necessitated a full workup to identify the cause. Any clinical presentation of post-cholecystectomy should not be underestimated and be thoroughly investigated; it is a lesson that we adopted as a protocol in the clinical pathway. Cholecystectomy is associated with several physiological changes in the upper gastrointestinal tract, which may account for persistence of symptoms or the development of new symptoms after gall bladder removal besides abdominal pain.[21]

In conclusion, PCS is not uncommon condition in our local community in Iraq, the incidence rate is aligned with that worldwide. Spillage of stones, recurrent attacks of acute cholecystitis and small size of stones are considered as risk factor for developing PCS.

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