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Urinary Incontinence in Patients Undergoing Cholecystectomy

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Abstract: A retrospective analysis of the medical records of 180 patients diagnosed with stress urinary incontinence who underwent cholecystectomy surgery between 2022 and 2024 was performed. The preoperative examination plan included the collection of the medical history. The data were then analysed retrospectively from multiple hospitals in Iraq, and data on the type of surgery and complications during and after surgery were collected. A retrospective study was conducted on 180 patients in Iraq who underwent cholecystectomy surgery. The patients were divided into two groups: the first group included 80 patients who underwent cholecystectomy and suffered from urinary incontinence, and the second group included 100 patients who did not suffer from urinary incontinence. The results were described for patients who underwent cholecystectomy. A study was conducted on 180 patients in Iraq who underwent cholecystectomy. The patients were divided into two groups: the first group included patients who underwent cholecystectomy and suffered from urinary incontinence (n = 80); the second group included patients who did not suffer from urinary incontinence (n = 100). The results were described for patients who underwent cholecystectomy in Iraq before the removal, as previously mentioned. No statistical differences were found in the two groups according to the laboratory results, which included hemoglobin and bilirubin (mg/dL). The results were evaluated during the surgical procedure according to several factors, including the Nassar scale. The prevalence of patients was found to be 17 patients in group 1 and 20 patients in group 2. As previously mentioned, the patients were divided into two groups prior to the removal. No statistical differences were identified in the two groups according to the laboratory results, which included haemoglobin and bilirubin (mg/dL). The results were evaluated during the surgical procedure according to several factors, including the Nassar scale. The prevalence of patients was found to be 17 patients in Group 1 and 20 patients in Group 2. The evaluation of the social, psychological, and mental characteristics of the quality-of-life index in patients of Group I for urinary incontinence in a sample of women above forty years of age was significantly affected. The effect of the problem on the various dimensions of quality of life, such as physical activity and social activities, was assessed. This study concludes that urinary incontinence has a significant impact on the quality of life of patients at all levels.

Keywords: Cholecystectomy, Quality of life, Urinary incontinence, Patients, Significant.

INTRODUCTION

It is widely acknowledged that complications arising from laparoscopic cholecystectomy are rare. This is due to the fact that this surgical technique is associated with minimal risk and does not place significant stress on the body. The use of a micro-camera during the procedure eliminates the possibility of error, as it enables the surgeon to monitor their actions and observe them on a screen. Furthermore, the absence of contact between the internal organs and air, as well as the utilization of surgical gloves by the surgeon, has been demonstrated to reduce the likelihood of adhesions, infectious processes, and other typical complications following gallbladder removal (Simon, L.V. *et al*., 2023; Mortelmans, D. *et al*., 2014). Postoperative rest and relaxation regimens are typically associated with urinary incontinence and bleeding (Urry, R.J. *et al*., 2016). The potential for separation of both the outer and inner edges of the wound is also a recognised complication (Santucci, R. *et al*., 2000). The principal indications of these postoperative complications following laparoscopic cholecystectomy are pain, urinary incontinence, bruising, blood clots in the abdomen, and black stools. Obese patients undergoing bariatric surgery have a history of biliary tract disease and a high rate of gallstones prior to surgery. Some studies suggest that up to 20% of patients undergoing bariatric surgery have gallstones or a history of cholecystectomy (Tay, K.P. *et al*., 1995).

Urinary incontinence (FI), defined as the involuntary or uncontrolled passage of urine, is a condition that significantly impairs the quality of life of those affected, affecting body image and self-esteem, interfering with daily activities, and promoting social isolation. Urinary incontinence Stress incontinence, characterized by the involuntary loss of urine during activities such as coughing, laughing, sneezing, or exercise, is caused by an increase in abdominal pressure, which in turn puts pressure on the bladder (Wirth, G.J. *et al*., 2010; Anderson, S. *et al*., 2022; Ballal, M. *et al*., 2019). Urgency incontinence is characterized by a sudden and intense need to urinate, often accompanied by difficulty in holding urine for a sufficient duration to reach a suitable restroom. The term 'overactive bladder' is used to

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denote a condition of mixed incontinence, which encompasses both stress and urge incontinence. Overflow incontinence, alternatively, is defined as the loss of urine in the presence of a full bladder (Matsui, Y. *et al*., 2018; Sinha, R. *et al*., 2012).

Cholecystectomy (the surgical removal of the gallbladder) is the most prevalent of all surgical operations performed on abdominal organs. The majority of patients report positive outcomes following surgery; however, 2-5 percent of patients develop Postcholecystectomy Syndrome (PHS) after surgery. Observations indicate that the duration of the disease prior to surgery and the number of attacks experienced are associated with the frequency of pain and other discomfort sensations post-surgery. The efficacy of the operation, both in the immediate postoperative period and in the long term, is contingent on the timing of the procedure, the absence of complications during the operation (Capoor, M.R. *et al*., 2008), and the patient's response to the inflammatory process. Emergency cholecystectomy for cholecystitis in patients with advanced disease is associated with the highest rate of postoperative complications (PCEs). Postcholecystectomy syndrome, therefore, is a syndrome of functional restructuring of the biliary system after surgery. This condition is characterised by the persistence of preoperative symptoms, such as recurrent pain and dyspeptic disorders, after surgery. Sling operations with artificial rings are currently the most prevalent treatment for stress urinary incontinence in patients (Swidsinski, A. *et al*., 2001; Vaishnavi, C. *et al*., 2006). Despite the plethora of studies that have demonstrated the efficacy and safety of these operations, the extant literature contains a paucity of studies that evaluate the long-term results of this type of treatment. Moreover, there are practically no studies that compare different variants of sling operations based on the extensive surgical experience of a single clinical centre. The paucity of research in this area has thus rendered the present study highly relevant, as it aims to analyse the extensive experience in using different types of sling operations to correct stress urinary incontinence in patients (Prakash, A. *et al*., 1974).

MATERIAL AND METHOD

A retrospective analysis of the medical records of 180 patients diagnosed with stress urinary incontinence who underwent cholecystectomy surgery between 2022 and 2024 was performed. The preoperative examination plan included the collection of the medical history, the performance of instrumental examination methods (cystoscopy, uroflowmetry with determination of residual urine), bacteriological analysis of urine, cough test, and Bonney test. The diagnosis of true stress urinary incontinence was made in patients of Iraqi origin who had experienced recurrent stress urinary incontinence and had a history of at least one unsuccessful surgical intervention. The demographic results indicated that the body mass index (BMI) was used to assess the relationship between height and weight, with the formula used to calculate BMI being body weight in kilograms divided by height in metres squared. The BMI categorises individuals as obese (BMI $\geq$ 30 kg/m2). It has been demonstrated that the restoration of erectile function and urinary control in obese patients occurs more slowly than in patients with a normal BMI.

According to the clinic's protocol, all patients undergo a standard examination one month after surgery, which includes a gynaecological examination with a cough test, measurement of urinary flow, and determination of residual urine.

The data were then analyzed retrospective from many hospitals in Iraq, and data on the type of surgery and complications during and after surgery.

It is widely acknowledged that complications arising from laparoscopic cholecystectomy are rare. This is due to the fact that this technique allows the operation to be performed with minimal risk without severe stress to the body.

During the intervention, the risk of error is eliminated, since the micro-camera tracks all the actions of the surgeon and displays them on the screen. Furthermore, the absence of air exposure to the internal organs, coupled with the utilisation of surgeon's gloves, has been demonstrated to reduce the likelihood of adhesions, infectious processes, and other postoperative complications. Postoperative complications such as urinary incontinence and bleeding are commonly associated with a failure to adhere to the prescribed rest and recovery regimen. The potential complications following laparoscopic cholecystectomy include separation of the wound edges, primarily at the inner and outer margins.

The predominant signs of these complications are pain and urinary incontinence, and A prospective patient survey was conducted utilising telephone interviews, wherein patients were queried about

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their satisfaction with the surgical outcome employing a visual analogue scale (VAS). This scale ranged from I, denoting extreme dissatisfaction, to V, representing extreme satisfaction. The survey outcomes were categorised into three distinct groups: dissatisfied (levels 1-2), satisfied (level 3), and very satisfied (levels 4-5). This categorization was employed to facilitate the analysis, which was subsequently conducted using statistical methods. In instances where patients expressed concerns, they were invited to attend the clinic for further evaluation. The statistical analysis and calculation of the required sample size were conducted by utilising a free sub urethral loop with a probability of effectiveness of 90%. A 20% variation in the success of the surgical intervention was deemed to be of clinical significance. To detect this difference with a significance level of 0.05 and a power of 80%, a sample size of at least 72 subjects per group was determined. Continuous variables were analyzed using Student's t-test, while proportions were compared using the chi-squared test and Fisher's exact test.

RESULTS

A study was conducted on 180 patients in Iraq who underwent cholecystectomy where. The patients were divided into two groups; the first group included (patients who underwent cholecystectomy and suffered from urinary incontinence for 80 patients) (and the second group included patients who did not suffer from urinary incontinence for 100 patients). It was noted in this study that obesity was highly prevalent among the group of patients, as shown in the body mass index. As for the comorbidities, the prevalence of hypertension and diabetes was found in both groups, as shown in Table 1.

Table 1: Study of demographic data and information related to Iraqi patients who underwent cholecystectomy

Variable	Patients 80	Control, 100	P-value
Age			
Mean (sd) years	33.9 (3.8)	34.2 (2.88)	0.948
BMI			
Mean (sd) kg/m2	32.2 (2.2)	31.1 (1.1)	0.88
Comorbidities, n(p%)			
Hypertension	10 (12.5)	8 (8)	0.094
Diabetes	18 (22.5)	17 (17)	0.05
Renal failure	12 (15)	10 (10)	0.027
Other	20 (25)	15 (15)	0.0764
None	20 (25)	50 (50)	0.00243
Education			
Low	20 (25)	29 (29)	0.772
College	40 (50)	31 (31)	<0.001
High	20 (25)	40 (40)	<0.001
Anatomical Changes			
pelvic Floor Dynamic	30 (37.5)	None	-
Sphincter Mechanism	50 (62.5)	None	-
Physiological Changes			
Neuroanatomical Disruption	44 (55)	None	-
Increased Intra-abdominal Pressure	36 (45)	None	-

In the table below, the results were described for patients who underwent cholecystectomy in Iraq before the removal; as we mentioned previously, they were divided into two groups, and no statistical differences were found in the two groups according to the laboratory results, which included hemoglobin Bilirubins (mg/dL), Leukocytes (x103)As for the reasons that led to the surgical procedure, they were Symptomatic Cholelithiasis, Acute and Chronic Cholecystitis, Biliary colic, Pancreatitis and The most frequent reason in this study was Acute, and Chronic Cholecystitis 22(27.5), The severity of gallbladder symptoms was also classified into both groups and moderate symptoms were found to be widespread with no statistical differences as shown in Table 2

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Table 2: Description of outcomes before surgical related to cholecystectomy

Variable	Patients 80	Control, 100	P-value
Preoperative laboratories, mean (SD)			
Hemoglobin (mg/dL)	1.77 (1.824)	1.90 (1.23)	0.83
Bilirubins (mg/dL)	162 (20.3)	152 (19.8)	0.625
Leukocytes (x103)	8.8 (3.3)	8.9 (2.73)	0.55
Causes			
Symptomatic Cholelithiasis	18 (22.5)	30 (30)	0.02
Acute and Chronic Cholecystitis	22 (27.5)	25 (25)	0.01
Biliary colic	20 (25)	25 (25)	0.0928
Pancreatitis	20 (25)	20 (20)	0.068
Classification of severity of cholecystitis, n (%)			
Mild	19 (23.7)	29	0.66
Moderate	41 (51.2)	51	0.82
Severe	20 (25)	10	0.05
Smoking			
Yes	28 (35)	22 (22)	<0.001
No	52 (65)	78 (78)	0.02743
Alcohol			
Yes	10 (12.5)	5 (5)	0.71
No	70 (87.5)	95 (95)	0.6123
Sex			
Male	33 (41.2)	44 (44)	0.21
Female	47 (58.7)	56 (56)	0.892

The results were evaluated during the surgical procedure according to several factors, including the Nassar scale. The prevalence of patients was found to be 17 patients in group 1 and 20 patients in group 2, with a score of 2 and statistical significance <0.05. The patients were also distributed according to Type of cholecystectomy, frequency and the prevalence of patients was found to be high in both groups Subtotal. As for the surgical time, it was higher in group 1 compared to group 2 and without any statistical differences between the two groups as shown in the table below.

Table 3: Intraoperative findings of patient's cholecystectomy Iraqi for 180 patients and control

Variable	Patients 80	Control, 100	P-value
Nassar scale			
1	15	25	
2	20	28	
3	15	30	<0.05
4	17	10	
5	13	7	
Type of cholecystectomy, frequency			
Total	33	40	0.041
Subtotal	47	60	0.07
Surgical time (minutes),	110.2 (20.82)	101 (16.8)	0.99
high blood pressure, frequency			
Yes	28	30	0.11
No	52	70	0.0812
ASA classification, n (%)			

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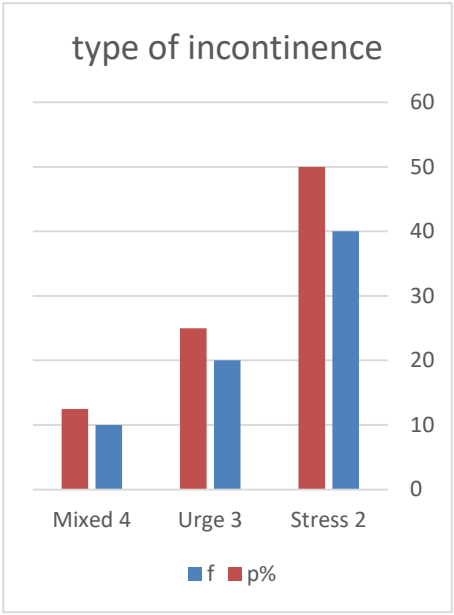
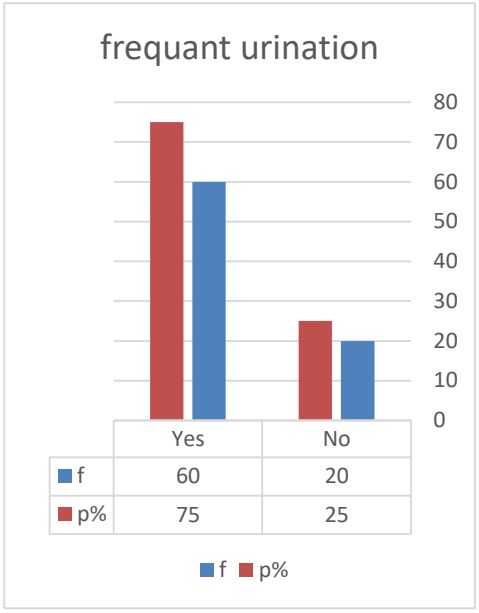
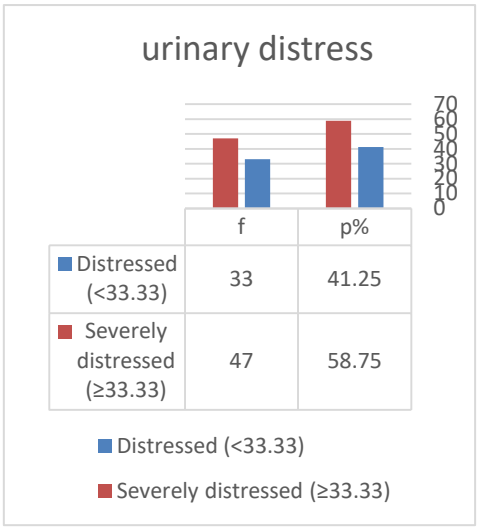
I	26	33	0.72
II	24	35	0.61
III	30	32	0.04
Conversion rate, frequency			
Yes	10	14	0.084







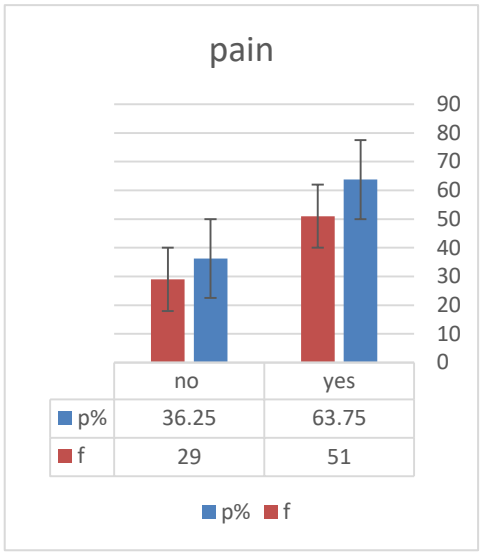


Figure 1: Description of outcomes of patients with urinary incontinence according to pain, severity of urinary incontinence, and cause

Table 4: Evaluation of quality of life and pain in patients with urinary incontinence (Questionnaire-7 (IIQ-7))

Variable	**Patients**		**Control**		**P-value**
	mean	sd	Mean	Sd	
Household chores	67.3	22.2	77.8	20.1	0.97
Physical recreation	77.93	17	101.1	18.2	0.056
Entertainment activities	69.2	28	106.6	17.82	0.03
Socialize	55.83	19	166	22	
Emotional health	61.1	21.2	171.1	23.3	<0.001
Feeling frustrated	89.2	10.783	144.78	23.9	

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Table 5: Health outcomes identified for risk factors influencing this study according to logistic regression

Variable	CIO	P-value
Sex female	1.1 (0.7-1.3)	0.992
Socialize	1.632 (1.2-2.7)	0.074
Emotional health	2.1 (1.7-3.3)	<0.001
Feeling frustrated	2.42 (1.1-4.4)	<0.001
Pain	2.9 (1.4-3.78)	<0.001
Distressed (<33.33)	1.62 (0.6-2.1)	0.046
Severely distressed (≥33.33)	1.45 (0.7-1.8)	0.022

DISCUSSION

Urinary incontinence has been observed to affect women at a higher prevalence rate than other chronic diseases, including hypertension, depression, and diabetes (Smith *et al*., 2022). A range of studies have indicated that the prevalence of urinary incontinence in women varies from 9 to 74% (Milsom, I. *et al*., 2019). When considering the various stages of a woman's life, it becomes evident that urinary incontinence has a significant social impact and has led to a growing interest in finding a real cure for this disease (Milsom, I. *et al*., 2019). Stress urinary incontinence (SUI) is characterised by the involuntary loss of urine during physical exertion, such as coughing, laughing, or lifting heavy objects. Urgent urinary incontinence (UI) is defined as the sudden and unexpected loss of urine, often precipitated by a strong urge to urinate. Mixed urinary incontinence (MI) is a combination of the two aforementioned types. It is noteworthy that nearly 50% of women with AIDS are diagnosed with this condition. Risk factors for hormonal contraception (IUS) include pregnancy, childbirth, menopause, and anatomical conditions of the pelvic organs (presence or absence of genital prolapse). However, lifestyle also plays an important role: excessive consumption of tea, coffee, and cigarettes and poor use of the abdominal muscles. There is also a natural predisposition to stress urinary incontinence associated with a congenital deficiency in collagen synthesis (Batmani, S. *et al*., 2021). Historically, cholecystectomy was approached via a variety of surgical methodologies. However, recent advancements have led to the adoption of several techniques that have the potential to reduce general complications for patients, minimise the necessity for general anaesthesia, and reduce hospitalisation duration when compared to previous approaches (Bo, K. *et al*., 2017). These techniques have also been shown to yield recovery rates ranging between 65 and 80%. Notwithstanding the encouraging recovery rates associated with urinary incontinence symptoms, it is important to note that the procedure carries a series of potential risks, particularly those related to bladder emptying and the subsequent risk of prolapses (Aoki, Y. *et al*., 2017; Milsom, I. *et al*., 2017). The contemporary tendency in urinary incontinence surgery is to carry out less invasive interventions, with a view to minimising complications and enabling patients to resume normal activities within a week. This approach is also in response to patient requests for treatment of benign diseases, such as urinary incontinence, which can have a substantial impact on quality of life. From this perspective, innovative minimally invasive surgical lift procedures appear to be an effective response to these requests. The prevailing paradigm in urinary incontinence surgery has evolved to encompass the pursuit of comparable outcomes to those achieved through traditional methodologies, yet with a reduced reliance on invasive techniques and the convenience of day surgery. This shift is largely attributable to the well-established benefits of these approaches when contrasted with their historical counterparts. The advent of gynecological laparoscopy has prompted the exploration of laparoscopic techniques for the management of stress urinary incontinence. Nevertheless, there persists a degree of uncertainty surrounding the comparative merits of these techniques in relation to transvaginal interventions (Gram, M.C.D. *et al*., 2020). There is no general consensus on the definition of quality of life. Quality of life is an inherently subjective and dynamic experience, influenced by personal and cultural values (and stereotypes), self-image, and the experiences and expectations of each individual and the group to which they belong. Psychosocial adjustment ("coping") to illness is unlikely to follow the same patterns across all life stages and in all circumstances. This makes it difficult to explore the "quality of life dimension" in purely psychological terms. However, a working definition of quality of life stems from a set of self-assessed measures of health status,

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including symptom burden, feelings of physical, cognitive, and emotional well-being, and the ability to fulfil the social functions of each person's role (Mota, R.L., 2017). Quality of life is measured as part of a structured history or through self-report questionnaires. Assessment of quality of life through structured questionnaires has not been shown to be reliable in relation to the level of health that patients feel they have. Symptoms associated with urinary incontinence are particularly common, especially in older people, but they still have a significant impact on the quality of life of any patient who suffers from them. Whether in daily clinical practice or in research protocols, the basic requirement is the correct assessment and recording of symptoms associated with urinary incontinence (Hay-Smith, E.J. *et al*., 2011; Frigerio, M. *et al*., 2022).

Today, symptoms associated with urinary incontinence and their impact on quality of life can be assessed through the patient's clinical history and through "new technical tools" such as the collection of urinary diaries or self-administered questionnaires.

Symptoms associated with lower urinary tract dysfunction are common in both males and females living in the community, with older people being more affected. According to a review by Age magazine in 1992 and according to a report by the Department of Care Policy and Research, the prevalence of urinary incontinence in males and females aged 20-50 years ranges from 1.5% to 5% and 10% to 25%, respectively. For the population aged over 50 years, the rate ranges from 15% to 30% and, in any case, has a devastating impact on the quality of life of 20% of adult women (considering that these women are twice as likely to be affected as men). Furthermore, more than half of patients admitted to nursing homes may have urinary incontinence. These prevalence rates are based on responses to a variety of questions, and only some of these questions were included in psychometrically validated questionnaires. Therefore, the range of variation may be related to this factor.

Evaluation of social, psychological, and mental characteristics of the quality-of-life index in patients of group I for urinary incontinence in a sample of women above forty years was significantly affected and assessed the effect of the problem onto the various dimensions of quality of life like physical activity and social activities. Recruitment of patients was done through a list of specialized centers disseminated throughout the country with selection based on willingness and availability to participate in the study. The following were implemented: an economic data collection questionnaire and a generic quality-of-life questionnaire SF36 - where analysis of the collected data allowed the identification of the most significant urinary incontinence-related quality-of-life questionnaire items. As regards quality of life, our study found that the scores on the SF-36 scales (physical activity, physical pain, role limitations due to physical health and emotional state, perception of general health, vitality, social activities, and mental health) obtained by the interviewed women were always below the normal range as for the Iraqi female population in general.

CONCLUSION

We conclude from this study that urinary incontinence has a significant impact on the quality of life of patients at all levels and that cholecystectomy has a minor impact on the patient group compared to the control group. Statistically significant differences were found between the two groups, which illustrates the significant impact of urinary incontinence in this study as one of the causes of decreased quality of life.

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