

Role of Ursodeoxycholic Acid in Prevention of Gallstones after Sleeve Gastrectomy

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ABSTRACT

Background: Gallstone formation after bariatric surgery is a general complication. Numerous strategies have been suggested to prevent gallstone disease among patients after bariatric surgery. The UDCA (ursodeoxycholic acid) is a bile acid taken orally for the prevention of gallstones formation by enhancing bile flow and decreasing its lithogenicity. It is very well-tolerated and has minor side effects.

Aim: To evaluate the role of ursodeoxycholic acid in the prevention of gallstones after sleeve gastrectomy.

Method: It was prospective study in which 416 patients admitted for Sleeve Gastrectomy at Hameed Latif Hospital Lahore were enrolled. The patients were randomly divided into 2 groups. Group-1 comprised 208 patients who underwent sleeve gastrectomy and used UDCA while Group 2 also comprised 208 patients who underwent sleeve gastrectomy but did not use UDCA. The role of UDCA in prevention of gallstones was assessed.

Results: Among 416 patients, majority (41.3%) was 41-50 years old and 56.3% were female patients. 35.8% patients had percentage of extra weight loss 51-60% due to surgery. Among 208 patients who used UDCA, only 5.3% developed gallstones while among 208 patients who did not use UDCA, majority (88.9%) developed gallstones at 12 months after surgery.

Conclusion: Study concluded that ursodeoxycholic acid plays a significant role in the prevention of gallstones after sleeve gastrectomy.

Keywords: Ursodeoxycholic acid, gallstones, sleeve gastrectomy, prevention.

INTRODUCTION

Bariatric surgery (BS) is a preferred treatment for patients with morbid obesity [body mass index above 40 Kg/m²] or obesity [body mass index above 30 Kg/m²] with co-morbid conditions. Co-morbid conditions associated with obesity comprise diabetes mellitus, cancer, hypertension, osteoarthritis, cardiovascular disorders, dyslipidaemia, and gallstones. Although, complications associated with surgical treatments still reduce the utilization of BS. Several techniques are available for bariatric surgeries such as gastric bypass, gastric banding and SG (sleeve gastrectomy)¹. The SG is carried out by eliminating a stomach part through large curvature with no disrupting the food passage, innervations or biliary system². During current era, SG has appeared as an effective and safe bariatric surgical procedure regarding satisfactory weight loss and low rate of complications³.

After sleeve gastrectomy, gallstones are the common complication and accounts for 15 to 47%^{3,4}. In addition, after gallstones formation complications for example, cholecystitis, pancreatitis, cholangitis and cholecystoenteric fistula could be developed². Stones increased occurrence is mostly due to bile supersaturation with cholesterol, caused by a raised synthesis by liver and emission in the bile⁵.

Weight loss over 25% of original body weight is believed a significant predictive factor for gallstone formation after bariatric surgery⁶. The formation incidence of gallstone varies between several kinds of bariatric surgery procedures⁷. Gallstones with no symptoms are found among 26.5% gastric banding patients, however, merely 6.8% patients are observed symptomatic after surgery⁸. Asymptomatic gallstones in Roux-en-Y method occurred among 30–52.8% patients after six to twelve months of surgery while symptomatic gallstones took place among 7 to 16% patients⁹. Regardless of that, after Roux-en-Y *gastric bypass* cholecystectomy was only required for 3.9 to 17.6% patients whether stones were present or not before BS⁷. Population-based two studies demonstrated that after bariatric surgery, patients had a 5.5-fold enhanced risk of cholecystectomy when compared with general populace¹⁰.

Numerous methods have been suggested and examined for the prevention of gallstones after surgery such as concomitant cholecystectomy as well as prophylactic UDCA therapy following surgical procedure¹¹.

Owing to rise in the gallstone disease, various health facilities recommend routinely prophylactic cholecystectomy. Though, this practices was found controversial because after BS all patients do not develop gallstones and during bariatric surgery cholecystectomy could be a problematic procedure, enhancing the iatrogenic bile duct injury risk¹². In addition, it is associated with

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potential risk for example, extended surgery time, enhanced morbidity and long hospital stay. Severe complications have also been reported among 2-3% cases^{13,14}. Hence, after gastrectomy avoiding formation of gallstone is essential to prevent onerous surgical procedures¹⁵.

Gallstones nonsurgical management has made significant progress during last twenty years.^[16] Latest researches have raised the likelihood that cholesterol-lowering drugs that hold back intestinal cholesterol assimilation (ezetimibe) or hepatic cholesterol synthesis (statins) or medicines acting on particular nuclear receptors engaged in bile acid and cholesterol homeostasis, could provide, alone or combined, extra medical curative tools regarding cholesterol gallstones treatment¹⁷.

The UDCA is a secondary bile acid that is metabolic byproduct of the intestinal bacteria. It decreases cholesterol absorption when offered as a medicine and is utilized to liquefy gallstones (cholesterol)². Several researches have demonstrated that after bariatric surgery UDCA management can avert formation of gallstone. Gallbladder contractility can be improved by UDCA through reducing cholesterol content in muscle cells plasma membrane and can excite biliary secretion, causing relieved cholestasis. Furthermore, other courses of action, for example damaged cholangiocytes protection and detoxification stimulation of the hydrophobic bile acids could cause ursodeoxycholic acid's effect. Hence, UDCA could be a safe and best option to the prophylactic cholecystectomy¹⁵.

Some surgeons recommend a temporary medicine for example, UDCA for the prevention of gallstones formation. Though, recent guidelines are unable to clearly state whether ursodeoxycholic acid should be utilized as a prophylaxis after surgery¹⁸. Therefore, current study is carried out to provide local evidence about the role of ursodeoxycholic acid in the prevention of gallstones after sleeve gastrectomy.

MATERIAL AND METHODS

It was prospective study in which 416 patients admitted for Sleeve Gastrectomy at Hameed Latif Hospital Lahore were enrolled. The patients aged between 20 to 60 years and BMI at least 40 kg/m² or BMI at least 35 kg/m² with comorbidity were included. The pregnant women, patients who had gallstones and history of cholecystectomy were excluded. The patients were randomly divided into 2 groups. Group-1 comprised 208 patients who underwent sleeve gastrectomy and used UDCA while Group 2 also comprised 208 patients who underwent sleeve gastrectomy but did not use UDCA. Treatment started 15 days after the surgery and continued for twelve months. During postoperative period, patients were followed up at 3, 6, 9 and 12 months. The Patients' information for example, age, sex, percentage of loss of extra weight and formation of gallstones was noted. The UDCA usage effect was also assessed. Data was collected through questionnaire, which was entered and analyzed using SPSS version 24.0. The data was presented in the tables and graphs. Informed written consent was taken from all patients and hospital ethical committee approval was obtained to conduct the study.

RESULTS

Table-1 demonstrates that among 416 patients, 54(13%) were 20-30 years old, 153 (36.8%) were 31-40 years old and majority 172(41.3%) was 41-50 years old while 37(8.9%) patients were 51-60 years old.

Table-2 depicts that out of 416 patients, 182(43.7%) were males and 234 (56.3%) were females.

Table-3 indicates that among 416 patients, 25(6%) had percentage of extra weight loss 20-30% due to surgery, 59(14.2%) had 31-40% and 183(44%) had 41-50% while 149(35.8%) patients had percentage of extra weight loss 51-60% due to surgery.

Table-4 reveals that among 208 patients who used UDCA for the prevention of gallstones, only 11 (5.3%) developed gallstones at 12 months after surgery and majority 197(94.7%) did not develop.

Among 208 patients who did not use UDCA for the prevention of gallstones, majority 185(88.9%) developed gallstones at 12 months after surgery and 23(11.1%) did not develop.

Table 1: Distribution of patients according to age

Age group	Frequency	Percentage (%)
20-30 years	54	13.0
31-40 years	153	36.8
41-50 years	172	41.3
51-60 years	37	8.9
Total	416	100.0

Figure-1: Distribution of patients according to age

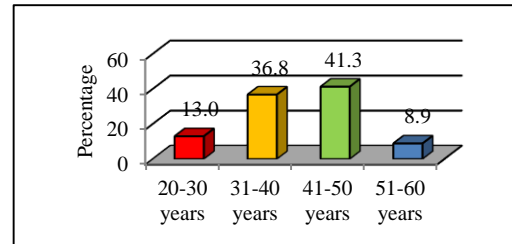


Table-2: Distribution of patients according to gender

Gender	Frequency	Percentage (%)
Male	182	43.7
Female	234	56.3
Total	416	100.0

Figure-2: Distribution of patients according to gender

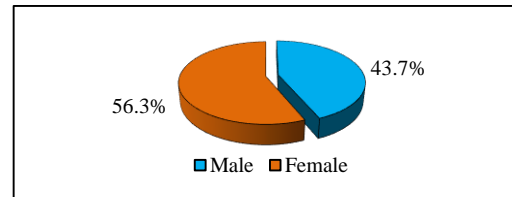


Table-3: Distribution of patients according to percentage of loss of extra weight due to surgery

% loss of extra weight	Frequency	Percentage (%)
20-30%	25	6.0
31-40%	59	14.2
41-50%	183	44.0
51-60%	149	35.8
Total	416	100.0

Table-4: Distribution of patients according to role of ursodeoxycholic acid in prevention of gallstones at 12 months after surgery

Postoperative gallstones	Use of UDCA			
	Yes		No	
	N	%	N	%
Developed	11	5.3	185	88.9
Not developed	197	94.7	23	11.1
Total	208	100.0	208	100.0

DISCUSSION

Cholelithiasis is a most common complication after sleeve gastrectomy. Present study was carried out at Hameed Latif Hospital, Lahore to evaluate the role of ursodeoxycholic acid in the prevention of gallstones after sleeve gastrectomy. To acquire appropriate outcomes, 416 patients were included in the study and found that 49.8% patients were upto 40 years and 50.2% patients were more than 40 years old while the findings of a study undertaken by El Shaer and teammate (2018) highlighted that majority (60.0%) of the patients were upto 40 years old and 40.0% patients were more than 40 years old.^[6]

As far as gender of the patients is concerned, study revealed that most of the patients (56.3%) were female and 43.7% patients were male. A similar study carried out by Atteiah and coworkers (2019) also confirmed that majority (68.3%) of the patients were female and 31.7% patients were male.^[18] Another study conducted by Abdallah and fellows (2017) confirmed that most of the patients (69.5%) were female and 30.5% were male.^[4] Same results were also reported by a recent study performed by Machado and associates (2019) who asserted that female patients (73.9%) were in majority than male patients (26.1%).^[12]

Weight loss above 25% of original body weight is believed a significant predictive factor for gallstone formation after surgery.^[6] The findings of our study showed that only 6.0% patients had %EWL (percentage of extra weight loss) 20-30% while remaining proportion of patients (94.0%) had %EWL 31-60%. Huang and collaborators (2019) reported in their study that more than half (52.2%) of the patients had percentage of extra weight loss $\geq 50\%$.^[19]

When the efficacy of ursodeoxycholic acid in the prevention of gallstones was assessed at 12 months after surgery, study showed very encouraging results that among patients who used UDCA for the prevention of gallstones, 94.7% did not develop gallstones and among patients who did not use UDCA, majority (88.9%) developed gallstones at 12 months after surgery. The findings of our study are almost comparable with a study carried out by Vural and comrades (2020) who reported that among patients who used UDCA for the prevention of gallstones, 70.5% did not develop gallstones and among patients who did not use UDCA, more than half (54.5%) developed gallstones after surgery.² The results of another study conducted by Machado and associates (2019) highlighted that among patients who used medication, 98.5% did not develop gallstones and among patients who did not use medication, 26.4% developed gallstones after surgery. Similarly, El Shenawy et al. (2019) elucidated in their study that among patients who used UDCA, 100% did not develop gallstones and those who did not use UDCA, 15% developed gallstones after surgery¹¹.

CONCLUSION

Study concluded that ursodeoxycholic acid plays a significant role in the prevention of gallstones after sleeve gastrectomy. Further studies are needed on large scale to assess the role of ursodeoxycholic acid in the prevention of gallstones after surgery.

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