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A STUDY OF PREDICTIVE FACTORS IN LAPAROSCOPIC CHOLECYSTECTOMY DETERMINING CONVERSION TO OPEN CHOLECYSTECTOMY WITH SPECIAL REFERENCE TO BODY MASS INDEX

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ABSTRACT: Laparoscopic cholecystectomy is regarded/considered as the gold standard treatment for symptomatic gall stone disease. Beside the advantages of decreased postoperative pain, better cosmetic results, decreased length of hospital stay, early return to work and decreased total hospital cost; the procedure is also associated with a definitive learning curve. There are many preoperative factors that can predict a difficult laparoscopic cholecystectomy which includes both clinical (Increasing age, male sex, history of acute pancreatitis) and ultrasonological factors (Contracted gall bladder, thickened gall bladder wall, impacted stone at neck of gall bladder). In today's world due to sedentary life style we are coming across patients with higher BMI even in socioeconomically weaker class which is a constrain in a successful laparoscopic surgery. We studied the correlation of Body Mass Index (BMI) with performance of laparoscopic cholecystectomy.

KEYWORDS: Laparoscopic cholecystectomy, Body mass index.

INTRODUCTION: AIM: To study the relationship of Body Mass Index (BMI) as a preoperative risk factor for conversion of Laparoscopic cholecystectomy to Open cholecystectomy.

MATERIAL AND METHODS: This prospective study was carried out in Department of General Surgery at three tertiary care hospitals across north India including LLRM Medical College, Meerut; Subharti Medical College, Merrut; BPS Government Medical College Khanpur Kalan Sonepat on 300 patients undergoing Laparoscopic cholecystectomy over a period of three years (2011-2014) as patients in all these three medical colleges more or less belong to similar ethnic origin. All patients with symptomatic gall stone disease irrespective of age and sex were included in the study. The patients with BMI>29Kg/m,[2] suspected carcinoma gall bladder, bleeding diathesis, cirrhosis of liver and significant comorbidities precluding general anaesthesia and any other preoperative condition that leads to difficult laparoscopic cholecystectomy except increased BMI were excluded from this study.

The detailed history was recorded and thorough clinical examination was done in all patients. Body Mass Index was calculated in all patients. On the basis of body mass index, the patients were divided into two groups (BMI< 25Kg/m²; BMI 26-29 kg/m²). The study was done after taking required approval and consent from institution and patients as required. All patients were investigated and taken up for laparoscopic cholecystectomy after getting the preoperative anaesthesia clearance (PAC). The laparoscopic cholecystectomy was performed with standard four port technique. The data collected was statically analyzed.

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OBSERVATIONS:

BMI	Total Patients (n=300)	Female Patients	Male Patients
< 25	200	150	50
26-29	100	70	30
Table 1: Depicting sex distribution of patients			

Of the total 300 patients, there were 220 female and 80 male patients.

200 patients had a BMI <25Kg/m^2 whereas 100 patients had a BMI 26-29 kg/m^2 as depicted in table 1.

BMI	MALE	Easy lap chole	Difficult lap chole	Con-version	FEMALE	Easy lap chole	Difficult lap chole	Con-version
<25	50	38	12	-	150	102	42	6
26-29	30	6	18	6	70	19	33	18
Total	80	44	30	6	220	121	75	24
Table 2: Depicting Distribution of BMI, Sex of patient and type of surgery performed								

Off the total 50 male patients (BMI <25Kg/m^2); 38 patients underwent an easy laparoscopic cholecystectomy and 12 patients underwent a difficult laparoscopic cholecystectomy.

Off the total 30 male patients (BMI 26-29Kg/m^2); 6 patients underwent an easy laparoscopic cholecystectomy, 18 patients underwent a difficult laparoscopic cholecystectomy and the procedure was converted to open cholecystectomy in 6 patients.

Off the total 150 female patients (BMI <25Kg/m^2); 102 patients underwent an easy laparoscopic cholecystectomy, 42 patients underwent a difficult laparoscopic cholecystectomy and the procedure was converted to open cholecystectomy in 6 patients.

Off the total 70 female patients (BMI 26-29Kg/m^2); 19 patients underwent an easy laparoscopic cholecystectomy, 33 patients underwent a difficult laparoscopic cholecystectomy and the procedure was converted to open cholecystectomy in 18 patients.

BMI	Easy lap chole	Difficult lap chole	Conversion	Total
<25	140 (70%)	54 (27%)	6 (3%)	200
26-29	25 (25%)	51 (51%)	24 (24%)	100
Total	165	105	30	300
Table 3: Depicting the relationship of BMI with difficult laparoscopic cholecystectomy				

Off the total 200 patients (BMI <25Kg/m^2); 140(70%) patients underwent an easy laparoscopic cholecystectomy, 54(27%) patients underwent a difficult laparoscopic cholecystectomy and the procedure had to be converted to open cholecystectomy in 6(3%) patients.

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Off the total 100 patients (BMI 25-29Kg/m^2); 25(25%) patients underwent an easy laparoscopic cholecystectomy, 51(51%) patients underwent a difficult laparoscopic cholecystectomy and the procedure had to be converted to open cholecystectomy in 24(24%) patients.

	No. of Cases difficult on Surgery	No. of Cases found to be easy on Surgery	Total
BMI <25 Kg/m^2	60	140	200
BMI 26-29 Kg/m^2	75	25	100
Total	**135**	**165**	**300**

Table 4: Depicting the Correlation of BMI and difficulty in performing Laparoscopic Cholecystectomy

The p value of BMI for predicting a difficult Laparoscopic Cholecystectomy came out in present study as 0.309 which is statistically less significant.

DISCUSSION: Gall stone disease constitutes a major public health problem. Carl Langenbuch performed the first ever cholecystectomy in 1882 for the gall stone disease[1]. Philip Mouret has the credit for performing first laparoscopic cholecystectomy in 1987[2]. The advent of laparoscopic cholecystectomy revolutionized the treatment of gall stone disease and is still regarded as gold standard treatment for gall stone disease till date. The advantages of laparoscopic cholecystectomy include decreased postoperative pain, better cosmetic results, decreased length of hospital stay, early return to work and decreased total hospital cost. However, the procedure is also associated with a definitive learning curve as well as increased risk of bile duct injury as compared to open cholecystectomy.

There are many preoperative factors that can predict a difficult laparoscopic cholecystectomy which includes both clinical (Increasing age, male sex, history of acute pancreatitis) and ultrasonological factors (Contracted gall bladder, thickened gall bladder wall, impacted stone at neck of gall bladder, empyema, cholecystocholedochal fistula).

In the present study, 200 patients had a BMI <25Kg/m^2 and 100 patients had a BMI 26-29Kg/m^2. Off the total 200 patients (BMI <25Kg/m^2); 140(70%) patients underwent an easy laparoscopic cholecystectomy, 54(27%) patients underwent a difficult laparoscopic cholecystectomy and the procedure had to be converted to open cholecystectomy in 6(3%) patients.

Off the total 100 patients (BMI 25-29Kg/m^2); 25(25%) patients underwent an easy laparoscopic cholecystectomy, 51(51%) patients underwent a difficult laparoscopic cholecystectomy and the procedure had to be converted to open cholecystectomy in 24(24%) patients.

Tayeb M et al concluded that BMI was not identified as an independent risk factor for conversion to open procedure in their study,[3] in the logistic regression model as odds ratio and 95% CI was 1.5 and p value was<0.153.

Nachnani et al encountered more difficulty in gaining access to the peritoneal cavity in patients with BMI >30 Kg/m^2 and in the logistic regression model the odds ratio and 95% CI was 0.375 and p value was<0.05 which was statistically significant.[4]

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Khanna AK et al found that patients with high BMI HAD more risk for conversion to open procedure. Statistically, BMI was found significant factor for conversion (p value < 0.003).[5]

Randhawa JS et al found that BMI >27.5 Kg/m^{2} was moderately significant for conversion to open cholecystectomy.[6]

Farkas DT et al concluded from their study that increased BMI was not associated with worse outcomes after LC. Compared with normal weight patients, obese and even morbidly obese patients have no increased risk of conversion to open surgery, nor is there an increased risk of perioperative complications. Obese and morbidly obese patients who require a cholecystectomy should be considered in the same category as normal weight patients, and LC should be the standard of care.[7]

Simupoulus C et al concluded from their study LC is effective and safe in patients with morbid obesity. As it carried low risks of conversion and perioperative complications, we suggest that LC is the select approach for these patients.[8]

Afaneh C et al concluded from their study that overall conversion rates and surgical morbidity are relatively low following LC, even in obese and morbidly obese patients.[9]

In the present study, we did not identify BMI as a significant independent predictor for difficult laparoscopic cholecystectomy. In the multivariate logistic regression it was identified as marginally significant with an odds ratio and 95% CI as 1.08 and p value <0.309.

CONCLUSION: Gall stone disease constitutes a major public health problem and is more common in females as compared to male patients. Laparoscopic cholecystectomy is the gold standard treatment for symptomatic gall stone disease and can be performed safely in majority of patients. However, there are certain preoperative clinical as well as ultrasonological factors that can predict a difficult laparoscopic cholecystectomy. The present study revealed that laparoscopic cholecystectomy can be performed in patients with increased BMI without any increased risk of conversion to open procedure and increased postoperative complications.

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