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Original Research Article

Safety and Efficacy of Elective Laparoscopic Cholecystectomy in the Elderly Patients: Observational Study

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Abstract:

Background: Increasing age has a greater impact on surgery. Optimisation of pre operative comorbidities have decreased the post operative morbidity to a such an extent that results have been comparable with the younger group. The aim of the study is to access the safety and efficacy of elective laparoscopic cholecystectomy in the elderly patients.

Methods: This is a retrospective study done between January 2022 to May 2023. Patients aged > 65 years were grouped as elderly patients. Disease matched control were taken from the same time period. Preoperative comorbidities such as diabetes, hypertension, neurological disabilities, pulmonary disease were analysed. Operative issues such as ASA grade, conversion, duration of surgery was taken into consideration. Post-operative recovery was analysed using calvein dindo score, time for first feed, time for mobilisation and length of hospital stay.

Results: In the study group mean age of elderly was 76.22 yrs. and young patients was 42.03 yrs. Comorbidities were significantly more in the elderly group like Diabetes Mellitus, cardiovascular disease, neurological disease, pulmonary disease but only cardiovascular disease was statistically significant.

In the operative issues, ASA was significantly increased in elderly (2.63). Duration of surgery was increased in control group. Post-operative recovery – morbidity was comparable between both the groups. However time to first feed, time for mobilisation, length of hospital stay was comparatively more in the elderly group.

Conclusion: Elective laparoscopic cholecystectomy can be safely performed in elderly patients. By proper optimisation of co morbidities & timing of surgery elderly patients will show results comparable results as young patients.

Keywords: Laproscopic Cholecystectomy, Post-Operative Recovery, Post-Operative Morbidity.

Introduction

Better health care facilities have improved the longevity in the general population. With this there is also a rise in the number of age-related diseases. Many studies have showed an increasing incidence of gallbladder stones with age, ranging from about 30% at the age of 60 yrs. to 80% for over 90 yrs. [1,2]. This increase incidence is due to dysmotility and sedentary lifestyle. This has led to increased biliary surgeries in the elderly and an ever-increasing potential risk of perioperative morbidity and mortality.

Surgical outcomes are generally bad in elderly patients as quoted in many studies [3] Proper selecting the patients even for early cholecystectomy has shown a better outcomes [4]. Despite the increasing prevalence, there is no uniform guidance on selecting the patients and pre-operative assessment [5]. Hence more studies are required for the optimal management of elderly patients.

In this study we have tried to elaborate that, in elective cholecystectomy, optimisation of pre-operative comorbidities have decreased the post-operative morbidity to a such an extent that results have been comparable with the younger group.

Materials and Methods

We have done a retrospective study done between January 2022 to May 2023 at Institute of Gastroenterology sciences and Organ Transplant, Bengaluru. Elderly patients above 70 yrs. of age who went elective cholecystectomy were part of the study [6]. The inclusion and exclusion criteria have been detailed below.

All patients were subjected to general anaesthesia and they went standard 4 port laparoscopic cholecystectomy. The details were recorded in a proforma and details tabulated. A control group was taken below 60 yrs. of age. The disease and sex were matched to have similarity. A total of 41 elderly patients was evaluated but 9 patients were converted to open cholecystectomy and hence excluded from study. Hence, we had a total of 32 patients in elderly group and matched control of 32.

The elderly patients were worked up for surgery on outpatient basis and admitted after optimising their co morbidities. Our evaluation for elderly includes blood chemistries, ECG, Echocardiogram, Chest x-ray for all patients. Pre anaesthesia evaluation on OPD basis or inpatient for admitted patients. Specialist opinion was taken when indicated. All the control groups were selected only for elective procedure with waiting period as mentioned.

Inclusion Criteria (Table-3).

a. Patients >70 yrs. for elderly group and<70 for control group
b. Elective laparoscopic cholecystectomy.
c. Post ERCP procedure after 4 weeks of waiting
d. Gall stones patients included biliary pancreatitis patients with 4 weeks of waiting
e. Gall bladder polyps with standard operating indications

Exclusion Criteria

a. Conversion to open cholecystectomy.
b. Emergency cholecystectomy.
c. Post cholecystectomy where Histopathology examination revealed malignancy.
d. Patients with renal disease requiring dialysis.

American society of anaesthesiologist (ASA) physical status classification system was used to stratify preoperative risk factors [7]. Post-operative morbidity was classified based on the Clavien-Dindo Classification of Surgical Complications [8]. Time to first feed and mobilisation was grouped into 3 categories as <12hrs, 12 – 24hrs, >24hrs so as to get a uniformity for study purpose.

Statistical Analysis

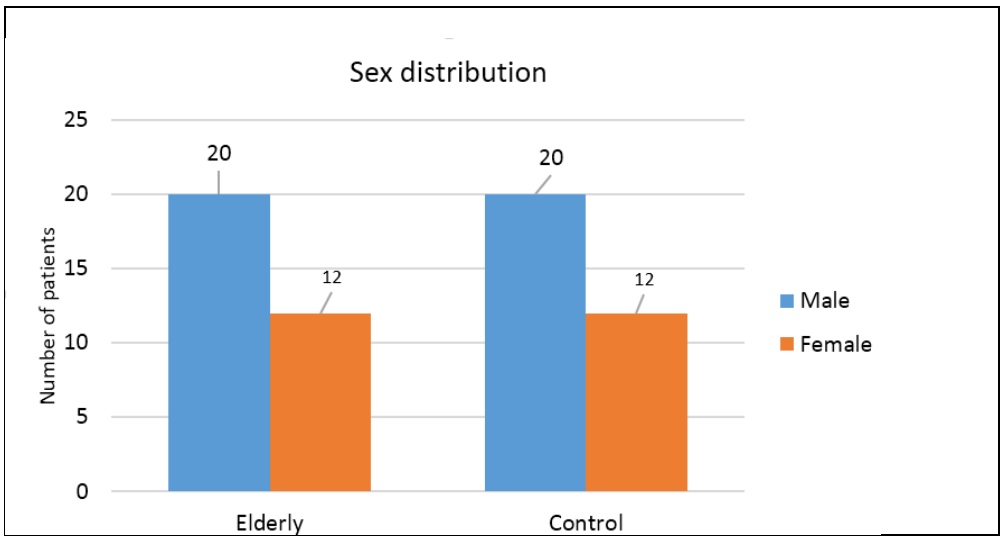
Descriptive statistics was performed for variables like sex and age. Variable sex was expressed as frequencies/percentages and age was expressed as Mean and standard deviation.

Association between elderly and younger groups with different diseases was compared with 'Chi-square test. Nonparametric test like Mann Whitney U test was applied to compare mean ASA ranks and Clavein Dindo grades between elderly and control group.

Independent sample t-test was applied to compare difference of 'Mean duration of surgery' and 'Mean Duration of stay'.

Association of ASA scores and Clavein Dindo grades between the groups were tested with 'Chi-square test'

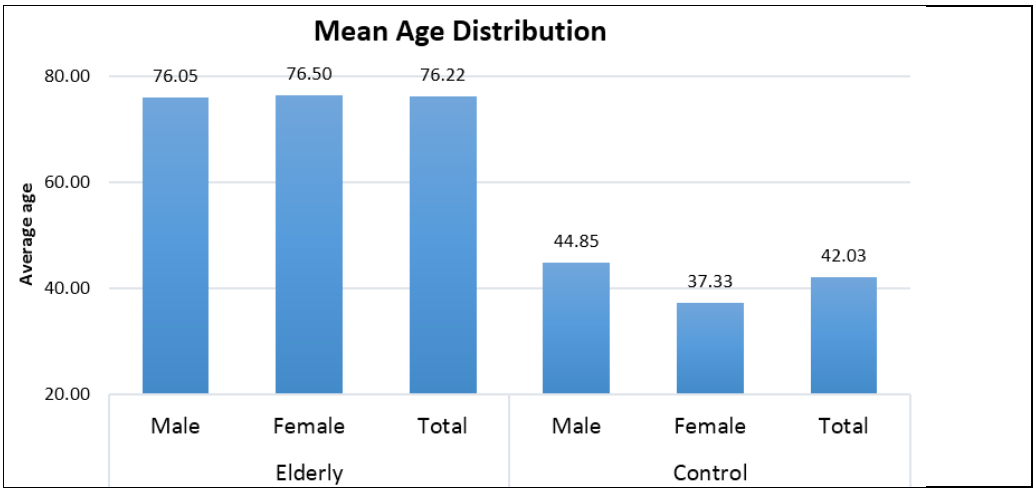
Results



Graph 1: Sex distribution

Table 1: Age distribution

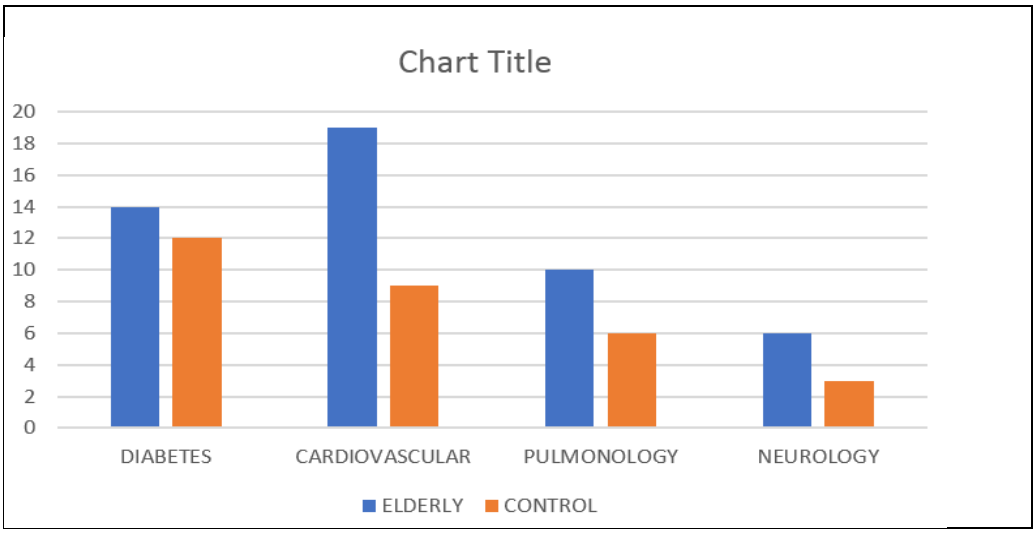
Group / Sex		N	Mean	Minimum	Maximum	Std. Deviation
Elderly	Male	20	76.05	70	90	6.22
	Female	12	76.50	71	85	4.03
	Total	32	76.22	70	90	5.43
Control	Male	20	44.85	20	67	14.31
	Female	12	37.33	18	68	15.41
	Total	32	42.03	18	68	14.95



Graph 2: Age Distribution

Table 2: Association of diseases

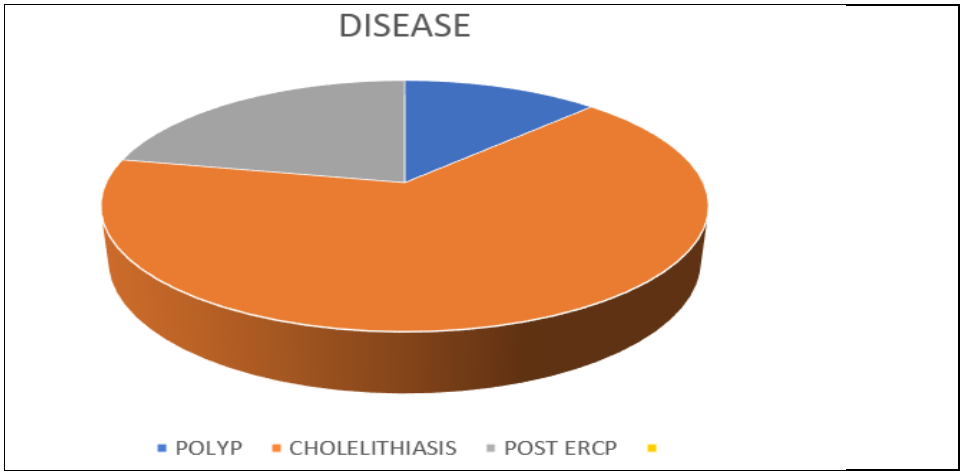
Group	Disease		p- value
	Elderly	Control	
Diabetes	14	12	0.611
Cardiovascular	19	9	0.012*
Pulmonology	10	6	0.248
Neurology	6	3	0.281



Graph 3: Association of disease

Table 3: Association of other diseases

Group	Disease			Chi-Square	P-Value
	Polyp	Cholelithiasis	Post ERCP	0.000	1.000
Elderly	4 (12.00%)	21 (65.62%)	7 (21.87%)		
Control	4 (12.00%)	21 (65.62%)	7 (21.87%)		

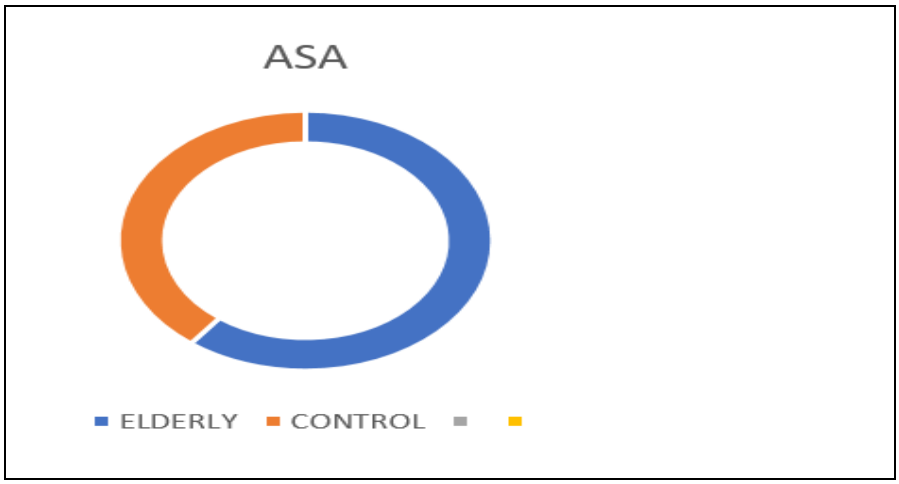


Graph 4: Association of other disease

Table 4: Comparison of ASA scores between elderly and control group

ASA	Group	N	Mean	Std. Dev	Mean Rank	Sum of Ranks	Mann-Whitney U	P-Value
	Elderly	32	2.63	0.94	40.69	1302.00	250.000	<0.001
	Control	32	1.72	0.92	24.31	778.00		

Range From 1 – 4



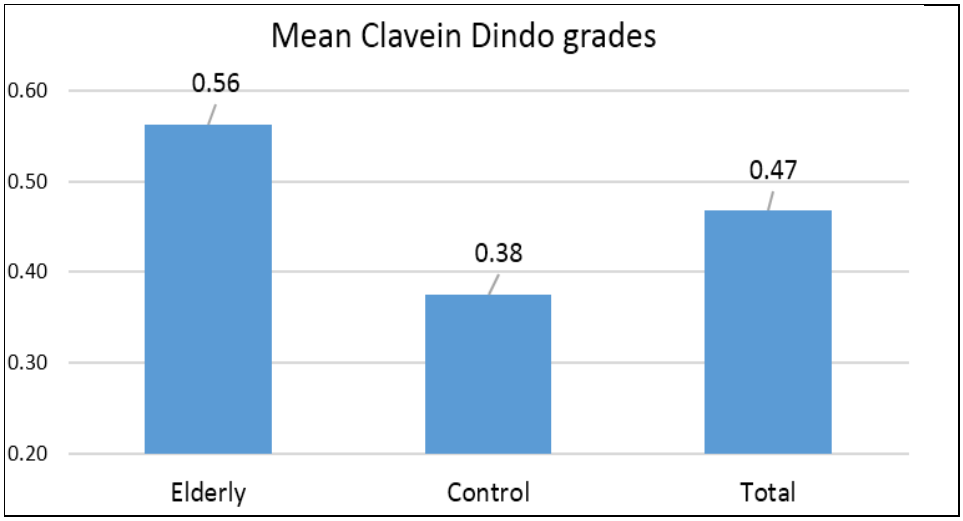
Graph 5: Comparison of ASA scores between elderly and control group

Table 5: Comparison of Duration of surgery between elderly and younger group

Group		N	Mean	Std. Deviation	Mean Difference	t-value	P-Value
Duration of Surgery	Control	32	94.81	31.150	23.563	3.590	0.001*
	Elderly	32	71.25	20.205			

Table 6: Comparison of Clavein Dindo grades between elderly and control group

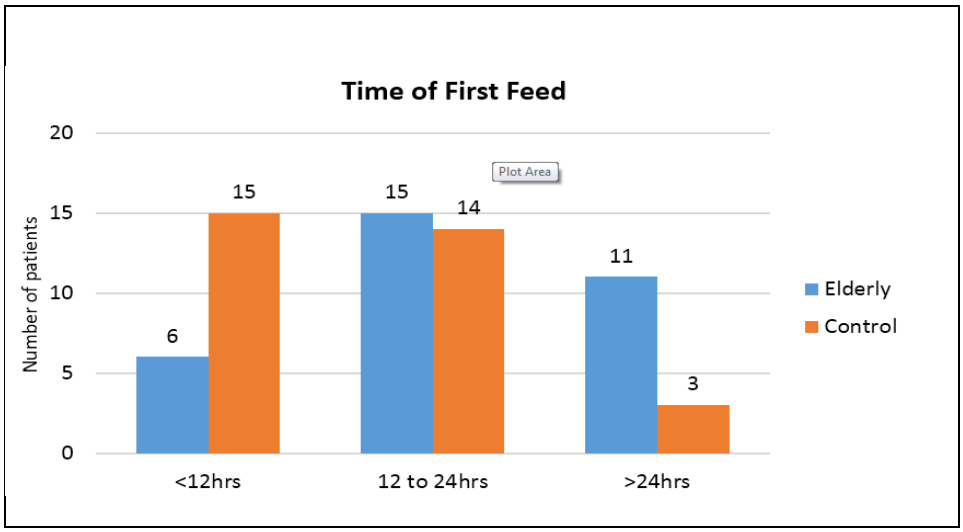
	Group	N	Mean	Min	Max	Std. Dev	Mean Rank	Sum of Ranks	Mann-Whitney U	P-Value
Clavein Dindo grades	Elderly	32	0.56	0	3	0.80	35.00	1120.00	432.000	0.189
	Control	32	0.38	0	2	0.75	30.00	960.00		
	Total	64	0.47	0	3	0.78				



Graph 6: Comparison of Clavein Dindo grades between elderly and control group

Table 7: Association of 'Time of First Feed' between elderly and younger group

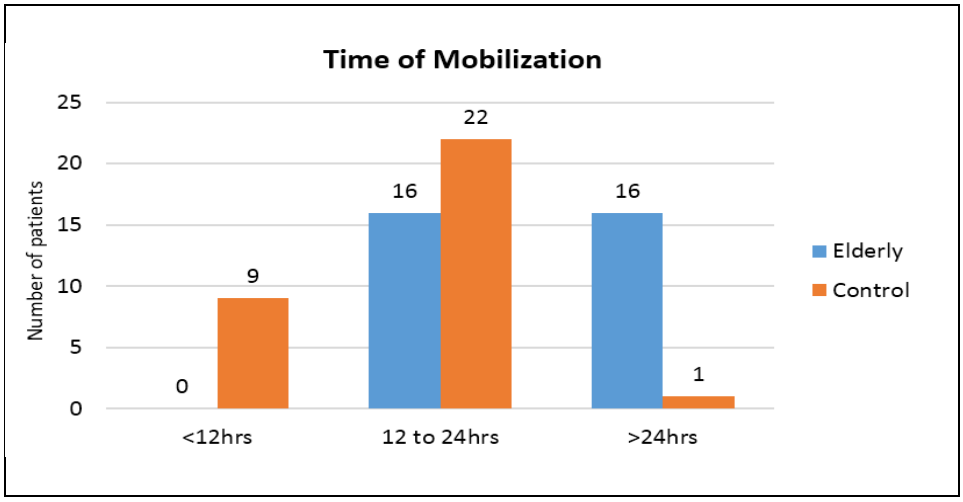
Group	Time of First Feed			Total	Chi-Square	P-Value
	<12hrs	12 to 24hrs.	>24hrs			
Elderly	6 (28.57%)	15 (51.72%)	11 (78.57%)	32 (50.00%)	8.463	0.015*
Control	15 (71.43%)	14 (48.28%)	3 (21.43%)	32 (50.00%)		



Graph 7: Association of 'Time of First Feed' between elderly and younger group

Table 8: Association of 'Time of Mobilization' between elderly and younger group

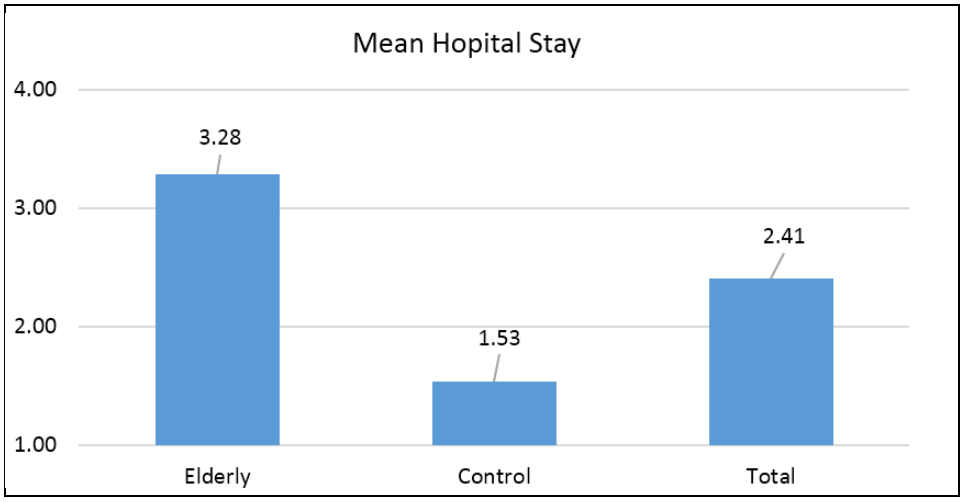
Group	Time of Mobilization			Total	Chi-Square	P-Value
	<12hrs	12 to 24hrs	>24hrs			
Elderly	0 (0.00%)	16 (42.11%)	16 (94.12%)	32 (50.00%)	23.183	<0.001*
Control	9 (100.00%)	22 (57.89%)	1 (5.88%)	32 (50.00%)		



Graph 8: Time of Mobilization

Table 9: Comparison of Duration of Hospital stay between elderly and younger group

Group		N	Mean	Std. Deviation	Mean Difference	t - value	P-Value
Hospital Stay	Elderly	32	3.28	1.198	1.750	7.210	<0.001*
	Control	32	1.53	0.671			



Graph 9: Comparison of Duration of Hospital stay between elderly and younger group

Discussion

Ambiguity exist when operating on the elderly. This study was a retrospective study, the sex and disease was matched appropriately, so as to have a better comparison between the elderly and young groups. These types of study is essential during decision making on operating on the elderly population.

The elderly age group composed of patients ranging from 70yrs to 90yrs with a mean age of 76yrs (S.D. – 5.43). The young patients were in the range of 16 yrs. to 68 yrs. with a mean age of 42.03yrs (S.D. 14.93). Hence in our study we have compared the mean age group of 76yrs to 42yrs. (Table- 1)

Elderly patients were mostly composed of male patients, sex controlled equal number of male patients were taken in the control group. (Graph – 1)

The patients co morbidities were studied broadly as patients with diabetes mellitus, cardiovascular disease, pulmonology disease, neurology disease [9]. (Table- 2) Interestingly in our study group only cardiovascular disease patient had a statistically significant difference between the groups. Although the elderly group had more patients with comorbidities, they were not statistically significant. There may be a bias in selection of control as we have taken only limited subjects in a large subset of patients.

The mean ASA Scores were higher in the elderly with mean of 2.63 as compared to the control of 1.72 [10]. This was statistically significant. This may be attributed to the increased comorbidities in the elderly. (Table- 4)

In our study group the mean duration of surgery was 71.25min as compared to the control of 94.81min. which implies elderly required less time for surgery. (Table- 5) This may be taken as a bias in our study, as this was a teaching institution the control group was operated on as a part of training. Even the standard deviation shows more difference between the elderly and the control which means time was not uniform in the surgeries.

There was no major difference in the complications b/w the study and the control groups. this one positive aspect of the study, which shows that properly selected elderly patients had comparable results as the young patients. (Table- 6)

We followed the principle of early feed after the surgery. (Table- 7) Our protocol was to start clear liquids, when the patient was fully conscious, the time when the patient was first fed was taken. In our study group significant number of young people were fed within 12hrs post-surgery. But most of the elderly tolerated liquids within 24hrs after surgery. Thus, both elderly and control groups were fed within 24hrs after surgery, which made no major difference on recovery from surgery.

We studied mobilisation in respect to move the patient out of bed to sitting position on bed or chair with or without support. (Table- 8) Control groups were mobilised early within 24hrs but interestingly no elderly was mobilised. However, in 24 hrs. significant number of elderly were mobilised. mobilisation for more than 24 hrs had a significant variation as 3 or 4 days has also been taken as more than 24hrs.

As expected, mean duration of hospital stay was more in the elderly [11]. The elderly had a mean duration of 3.28days. control group had a mean of 1.53 days. (Table- 9)

No mortality or bile leak was observed during our limited study period. By analysing the above obtained statistics, elderly patients should be properly worked up in respect to optimisation of co morbidities, indication of surgery, timing of surgery [12]. This will enable to have surgical outcomes comparable to the young patients.

Conclusions

Elective laparoscopic cholecystectomy can be safely performed in elderly patients. By proper optimisation of co morbidities & timing of surgery elderly patients will show results comparable results as young patients.

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