ORIGINAL RESEARCH PAPER

Volume-7 | Issue-12 | December-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARATIVE STUDY OF SAFETY OF LAPAROSCOPIC CHLOECYSTECTOMY AND RISK ASSESSMENT OF VTE IN GERIATRIC VERSUS YOUNGER.

Surgery

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ABSTRACT

BACKGROUND AND OBJECTIVE: The elderly population is gradually increasing due to an increase in the quality of life and therefore the frequency of gall bladder stones in the population is also increasing.VTE is a major cause of morbidity and mortality in patients undergoing gastro-intestinal surgery. The incidence of fatal PE ranges from 0.1% to 0.8% in patients undergoing elective general surgical procedures. Despite wide acceptance of laparoscopic procedures for many general surgical cases, the incidence of VTE is not well defined. In this study we aim to compare the outcome of laparoscopic cholecystectomy(LC) in the elderly and younger patients and also outline the prophylaxis strategies based on the calculated risk for VTE as per Caprini Guidelines score.

MATERIALS AND METHOD: 160 patients who underwent LC between 2016 to July 2018 at tertiary care hospital. The patients were grouped between (Group A—65-70years, Group B—71-75years,group c-- ≥76 and Group D is less than 65 years).Comparison between the groups was made and results were analysed by using chi-square tests .

RESULTS: ASA scores were statistically significantly higher in ≥60 years age group ($p<0.001$).The rate of experiencing acute cholycystitis with a stone in the gall bladder was significantly higher in 65 years group.Comorbidity was stastically significantly higher in the ≥65years age group($p<0.001$).We assessed the risk of VTE for all 120 patients using caprini score and level the risk according to total risk factor.We found that the level of risk a sper caprini score were between moderate to high.

CONCLUSION: Laparoscopic surgeries may have an increased risk for development of VTE, due to abdominal pressure, reverse trendelberg position as well as prolonged surgery time. Patients with co morbid illness like varicose veins, h/o thromboembolism, may increase the risks of development of thromembolic complications. Assessment of risk postoperativerly and recommendations of VTE prophylaxis is considered in moderate to highest group. Based on the findings of this study, we believe that laparoscopic cholecystectomy in elderly patients is a reliable approach that allows patients to benefit from the advantages of minimally invasive surgery without further increasing the risks of surgery.

KEYWORDS

INTRODUCTION:

Improvements in perioperative care for ageing population have resulted in an increasing number of elderly patients being considered for surgery. With an incidence of Gall stone disease of 14 to 27 %(1), significant number of elderly patients are referred for surgery. Limited functional reserves and the presence of associated chronic co morbidities leads to increased risk and complications of surgery in the elderly(2).Maybe reduced by minimally invasive surgery which is associated with a shorter hospital stay and fewer complications in elderly patients (3).However even with laparoscopic surgery the population over 80 years old undergoing LC, may have morbidity rates of 2.2- 24% and mortality rates of up to 2.8 %(3-7).The Incidence of acute and chronic cholecystitis,severe scarring and adhesion, common bile duct stones, gall stones pancreatitis, previous upper abdominal surgery and gall bladder cancer are all increased in a elderly population(5-7).Patients over 80years generally have higher conversion rates 2.2 to 37%(8-10). Despite wide acceptance of laparoscopic procedures for many general surgeries cases, the incidence of VTE is not well defined. The incidence of fatal pulmonary embolism ranges from 0.1% to0.8% in patients undergoing elective general surgical procedure. SAGES (society of American Gastrointestinal and endoscopic surgery) 2007 has developed risk for stratification for patient undergoing laparoscopic surgeries. Since the publication of the SAGES guidelines ,the American college of chest physicians (ACCP) has their comprehensive guidelines that address VTE prophylaxis for non orthopaedic surgery patients (11).The ACCP guidelines uses the VTE risk stratification systems by Rogers and Caprini (12,13).We adopted Caprini guidelines(2005) to stratify the risk of VTE for our cases. We have used numerous points from caprini guidelines according to clinical condition and individual patient factors.(14) (table:1).Laparoscopic surgeries of all types causes serum hypercoagulability of varying degree (15).Simple laparoscopic cholecystectomy,probably has low risk of VTE disease(16).Along with operative factors, patient factors likes age,immobility,history of VTE,varicose vein,CRF,CHF,history of MI,hormone replacement therapy and obesity,all increases risk (17,18).

We outline the prophylaxis strategies based on the calculated risk for VTE.As per Caprini guidelines score(table-2) with 0 to 1 are low risk with incident of DVT, 10%.For score 2, moderate risk with DVT risk of 10 to 20 %.For score 3-4, high risk level with DVT risk of >20-40%.And for score ≥5, highest level of risk with DVT RISK OF 40 - 60%.(Table-3).The overall incidence of clinical evident DVT was 1.6% without prophylaxis.The aim of this study was to assess safety of LC and risk stratification of VTE in Patients undergoing LC.

METHODS

160 patients who underwent LC between 2016 to July 2018 at tertiary care hospital. The patients were grouped between (Group A—65-70years, Group B—71-75years,group c-- ≥76 and Group D is less than 65 years).

Results obtained from A,B,C, were compared amongst each other as well as with result of group D.LC was performed using a standard 4 –port techniques. Pre-operative endoscopic retrograde Cholangiography was utilised in patients with common bile duct stones.

The following patients data were recorded, age, sex, ASA classification, indication for surgery,Pre-operative ERCP,conversion to open surgery, Post operative length of hospital study,mobidity and mortality.

RESULT :-

OF 120 patient enrolled in the study 40 were between 65-70(group A) mean age was 67.185±1.922 Between 71 and 75 year (group B) mean age was 73.33±1.65 Were 80 or older (group C) mean age was 82.75±2.21 the remaining 80 patients (group D) were <65 years, mean age was 46.89±12.87 In group A female were 77.77% and male 22.33%. In group B female were 44.44% and male 55.55% .In group C female were 25% and were 75% . In group D female were 57.50% and

male were 42.50%.

Above female ratio suggested that group B, group C with patient>70,the proportion of females were noticeably lower as a sure assessment of the groups revealed that these scares increased with age . The percentage of patient in group A with as a (2)were 25.925 and ASA (3) were 74.07% In group B the patient with ASA (2)were 33.33% and 66.66% with ASA(3). In Group 'C' – there were 100% of patient with ASA (3). In Group 'D'. ASA (2) were 25% and 75% were patients with ASA(3). The differences between The ASA scores were statistically significant ($p<0.001$)(table-4)

The majority of the patients in all study groups who were operated on for acute cholecystitis constituted 20.4% (group A,B,C)26.8% (Group D) of all patient this difference with respect to about cholecystitis was not statistically significant between the 2 groups however analysis of pt>70.revealed that the rate of acute cholecystitis was 50% in patient >76, which was significantly higher conversion to open cholecystectomy was required in 3 at of 80 in <65 year (3%)and 5 and 40 in group≥65 year (12.5%). Although the conversion rate was higher in the older age group. The difference was not statistically significant. The conversion rate in patients agued 80 or above was higher hence that in the other group. In all age groups, the most common reasons for conversion was failure to adequately visualize the biliary tract anatomy due to intense fibrosis around the gallbladder and calot's triangle.Other reasons for conversion to open surgery in this study were intra-operative bleeding uncontrollable by laparoscopy , dense adhesions due to prior laparotomy and injury to common bile tract. No cases of gall bladder cancer detected in our case. Post operative surgical complication rates were 15% in >65 year and 7.5% in <65 years. Post operation systemic complication rates were 17.5% in >65 years and 7.5% in 65 years .Pt with >80 years, complication rates were higher there other age group.

Mean hospitalization was 1.62±1.31 days in <65 years with 2.6±1.4 days in >65 years. This shows that length of hospital study increased as age increased no death occurred in either group

DISCUSSION

Biliary tract disorders are one of the most common reasons for surgery in elderly patients. Fifty percent of women and 16 % of men in their 70 s have been shown to have gall bladder disease (19).

LC has been shown to have a shorter hospital stay, less operative physiologic dysfunction, and an earlier return to daily activities than open cholecystectomy. The attainment of such group in required in older patients (20). Elderly age in frequently associated with co morbidity and limited function reserve, which may complicate a post operative course. pre operative risk assessment of VTE and cardiovascular that needs monitoring of the patients for detection and treatment of possible complications (21) In this study the evaluation of ASA scores showed a parallel increase with age . In a study by Yi et al., the authors reported higher ASA score to increase the mortality and morbidity but not affect the operation duration and time to discharge (22) . The reported incident of morbidly and mortality with open cholecystectomy in elderly population in 23% to 28% and 1.5% to 2% respectively. The morbidity among elderly patients (4) who had undergone LC was reported to be 5-15% where mortality was represent to be 0%-1% for the same group (8,23).In the present study the morbidity was 17.5% and no mortality was found. Despite high ASA scores , no peri-operative complication occurs in the elderly patient >65 years . Previous studies have shown that the incidence of acute cholecystitis is higher in elderly patients.In our study,although the acute choleysystitis was more frequent in patients aged 65 or older compared with younger individuals, this difference was not statistically significant. On the other hand, analysis of patients more than 65 revealed that the of acute cholecystitis was 50% in patients >76 years. we believe this finding explains the higher complication rates in patients above age >76 years (3,5). Conversion to open surgery was 12.5% in elderly group. This figure in concordant with the numbers reported in the literature, which range between 5% and 25% (8, 10, 19). The conversion rate was 3% in the younger age group. The conversion rates were higher in elderly patients >76 years. Increased age has been noted in the literature as a pre operative risk facture for conversion, perhaps due to a longer history of gallstones and increased number of cholecystitis attack (24). Higher complication rates observed in patients aged 76 or more seem to be resulting from more difficult cholecytectomies (acute cholecystitis, fibrotic gallbladder, mirizzi syndromes, and other). We evaluate the patients of LC by clinical as well as by ultrasonography. Severe thromboembolic complication has been reported after laparoscopic procedure (16, 17).Despite this, there is a controversy about the use of prophylaxis for VTE in laparoscopic surgeries (18, 19).Bradbury et al considered that only 20% has got thromboembolic complication (20).

It has demonstrated that long operative time and reverse trendelberg position are adding factor for DVT .In our case the operative time is one of the major risk factor of falling majority of patients in moderate to high group.

Nguyen NT et al reported that there was a statistically significant reduction in risk of VTE after laparoscopic surgeries compared to open surgery. (27).

In case the patient has clinical, biochemical or radiological finding suspicious of the presence of bile duct stones, we perform MRCP which is a non-invasive and rather sensitive method. In our study we missed 0.835(1/120) of the stones in our study, which was removed with ERCP after the operative, which may be due to the high sensitivity of MRCP. In the study of charfare et al (25) pre-operative ERCP was performed and postoperatively retained stones were present in 1.2% of these patients, similar to our finding. In another study by Collins et all,(26) among 997 laparoscopic cholecystectomy patients, clinically silent choledocholithiasis was present in 3.4%, one third of which passed spontaneously within 6 weeks of the operation. Based on these previous finding and the results of Nugent et al (27) we believe that selective biliary imaging like MRCP not only represents a safe and effective tool for preoperative identification of bill stones, but also reduces the need for unnecessary ERCP and intra-operative cholangiograply procedures.

CONCLUSION:

Laparoscopic surgeries may have an increased risk for development of VTE, due to abdominal pressure, reverse trendelberg position as well as prolonged surgery time. Patients with co morbid illness like varicose veins, h/o thromboembolism, may increase the risks of development of thromembolic complications. Assessment of risk postoperativerly and recommendations of VTE prophylaxis is considered in moderate to highest group. Patients over 65 years should be considered for laparoscopic cholecystectomy for symptomatic gallstones. Although the overall risk of complications remains higher in these patients, conversion rates can be low. Based on the findings of this study, we believe that laparoscopic cholecystectomy in elderly patients is a reliable approach that allows patients to benefit from the advantages of minimally invasive surgery without further increasing the risks of surgery.

Table-1: Points taken from Caprini Score Guidelines for VTE in the present study.

age	<40 Years (0)	61-74(2)
	>41-60 years(1)	≥75(3)
Time of Surgery	<45 min(1)	
	>45 min(2)	
Recent events		
	HTN(1)	
	DM(1)	
	DVT PROPYLAXIS(3)	
	BMI>25(1)	
	VARICOSE VEIN(1)	
	STROKE(5)	
	MOBILITY(0)	
	COPD(1)	
	ACUTE MI(1)	
	CENTRAL VENOUS ACCESS(2)	

Table 2. **Caprini Risk Assessment Model***

1 Point	*2 Points*	*3 Points*	*5 Points*
Age 41-60 y	Age 61-74 y	Age ≥75 y	Stroke (<1 mo)
Minor surgery	Arthroscopic surgery	History of VTE	Elective arthroplasty
BMI >25 kg/m²	Major open surgery (≥45 min)	Family history of VTE	Hip, pelvis, or leg fracture
History of major surgery (<1 mo)	Laparoscopic surgery (>45 min)	Positive factor V Leiden	Multiple trauma (<1 mo)
Varicose veins	Cancer (past or present)	Positive prothrombin 20210A	Acute spinal cord injury (<1 mo)
Swollen legs	Patient confined to bed (>72 h)	Elevated serum homocysteine	
Acute myocardial infarction	Immobilizing plaster cast (<1 mo)	Positive lupus anticoagulant	
Congestive heart failure (<1 mo)	Central venous access	Elevated anticardiolipin antibodies	
Sepsis (<1 mo)		Heparin-induced thrombocytopenia	
Serious lung disease, such as pneumonia (<1 mo)		Other congenital or acquired thrombophilia	
Chronic obstructive pulmonary disease			
Medical patient on bed rest			

BMI = body mass index; VTE = venous thromboembolism.
** From Caprini JA. Risk assessment as a guide for the prevention of the many faces of venous thromboembolism. Am J Surg. 2010;199:S3-10. For use of this table, see text on prevention of VTE in hospitalized surgical patients.*

Table-3

Table II. Risk levels and recommendations according to risk level

Total risk factor score	Incidence of DVT	Risk level	Prophylaxis regimen
0 - 1	<10%	Low	No specific measures, early ambulation
2	10 - 20%	Moderate	ES, IPC, LDUH or LMWH
3 - 4	20 - 40%	High	IPC, LDUH or LMWH
≥5	40 - 60% (1 - 5% mortality)	Highest	Pharmacological; LDUH, LMWH, warfarin or Fxa inhibitor alone or in combination with ES or IPC

ES/GCS = elastic stockings/graduated compression stockings; IPC = intermittent pneumatic compression; LDUH = low-dose unfractionated heparin; LMWH = low molecular weight heparin.

Table-4

GROUPS	A65-70	B71-75	C≥76	D<65
N	27	9	4	80
M/F	6/21	5/4	3/1	34/46
ASAI	0	0	0	0
II	7	3	0	20
III	20	6	4	12
IV	0	0	0	0

Table-5: Assessment as per caprini score

CS	Gr-A	Gr-B	Gr-C	Gr-D
0	0	0	0	0
1-2	2	0	0	58
3-4	17	4	0	14
≥5	8	5	4	8

Table-6: Risk level according to caprini score

Cs	N=patients
Low(0-1)	0
Moderate(2)	2
High(3-4)	21
Highest(≥5)	17

Table-7: Conversion to LC to open cholecystectomy

Calots Δs difficult	<65 2	>65 2
Intraoperative bleeding	0	1
Bile duct injury	1	2
total	3	5

Table-8.Complications

surgical	<65	>65
Bile duct injury	1	2
Bile leak	1	1
Subhepatic collection	2	1
Wound infection	2	2
Systemic		
MI	0	1
Arrhythmia	1	1
Atelectesis/chest infection	3	3
UTI	2	2

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