

## A Study on the Incidence of Venousthromboembolism in Laproscopic Surgeries in Tertiary Care Centre

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**Abstract:** Laparoscopic surgeries is a very common procedure performed all over the world

There is controversy on possible side effects of laparoscopic surgeries like deep vein thrombosis. American college of chest physicians in 2004 and 2008 recommended against the use of routine thromboprophylaxis in patients who undergo laparoscopic procedures if without any additional thromboembolic risk factors. Thrombosis may be caused by detrimental effect of pneumoperitoneum on venous flow ( increased abdominal pressure and negative trendelenberg position)

General anesthesia is another risk factor for venous stasis in patients undergoing laparoscopic surgeries since it may cause stasis and DVT compared to spinal anesthesia. The other components of Virchow triad, hypercoagulability and endothelial injury may also seen during or after laparoscopic surgeries. This information is required to direct thromboprophylactic strategies to patients undergoing laparoscopic surgeries. Trial of extended thromboprophylaxis are much needed in patients at particularly high risk

**Key words:** laparoscopic surgeries, deep vein thrombosis.

Date of Submission: 27-11-2018

Date of acceptance: 08-12-2018

### Aim

- To determine the frequency of deep vein thrombosis in patients undergoing laparoscopic surgeries.
- **Is laparoscopic pneumoperitoneum a risk factor for the development of deep vein thrombosis**

### I. Materials and Methods

**Study design:** prospective study

**Sample size:** 60

**INCLUSION CRITERIA:** patients undergoing elective laparoscopic surgery in general surgery department

**EXCLUSION CRITERIA:**

- 1)Patients undergoing emergency surgeries.
- 2) immunocompromised individuals.
- 3)Hiv/Hbsag/Anti-Hcv positive individuals
- 4)Age <15 years and >65 years.
- 5)History of long standing steroid abuse or Oral contraceptive pill.
- 6)inherited coagulation disorder are also excluded from this study.

- In this study patients are included based on inclusion and exclusion criteria
- Written and informed consent is obtained from all patients who undergo study
- Patients are evaluated pre-operatively, data includes age, gender, medications, comorbidities, Body mass index, risk factors and presence of deep vein thrombosis is ruled out by both clinical examination and preoperative venous doppler of both lower limb
- Type of surgery done will be determined by the preference of surgeon. All laparoscopic surgeries were performed by one surgeon or his chief resident under supervision. The peritoneum was insufflated with carbon dioxide to set intrabdominal pressure in surgeon's choice. The pneumoperitoneum was deflated at least once during the surgery in all patients
- In Patients who undergo elective laparoscopic surgeries both duration of surgeries and intraoperative events are tabulated and recorded as per proforma
- Patients were shifted to SICU and were monitored for symptoms (dyspnea, chest pain, lower limb swelling and pain) and signs of venous thromboembolism during postoperative period
- Routine venous doppler of both lower limb was done at postoperative day 1 and day 3
- Duration of postoperative stay from the end of anesthesia to time of discharge was measured

- Patients were followed up and venous doppler of both lower limb was done at postoperative day 10
- All details regarding the study will be recorded according to the pre designed proforma mentioned below

## **II. Results**

### **AGE**

- In my study , the total population is 60
- The mean age of population is 38.28 with standard deviation of 15.8.
- Regarding distribution 10 patients are upto 20 years of age ( 16.7 % of population).
- 14 patients (23.3 % ) of study population fall between 21 – 30 years .
- 11 patients fall between 31 – 40 years (18.3% of population).
- 12 patients fall between 41-50 years ( 20% of population )
- 8 patients fall between 51-60 years ( 13.3% of population )
- 5 (6.7% of population )patients fall in above 50 group.
- **IN MY STUDY MOST COMMONEST AGE GROUP IS 21 – 30 YEARS,WHICH IS 23.3 % OF MY POPULATION**
- **LEAST COMMONEST AGE GROUP IS ABOVE 60,WHICH IS 8.3 % OF MY POPULATION**

### **SEX**

- In the total population of 60, only 26 cases was male , females in my study is 56.7 % & males are 43.3 %
- **IN MY STUDY THE MOST COMMONEST SEX AFFECTED IS FEMALE (56.7 % )**

### **DIAGNOSIS**

- Total no of patients affected by cholelithiasis in my study population are 33 which is 55 % of my population , followed by appendicitis (26.7 % ) , gallbladder polyp (8.3 %), inguinal hernia and cholecystitis (2 % )& appendicolith (1.7 %).
- **THE MOST COMMONEST DIAGNOSIS FOR WHICH LAPROSCOPIC PROCEDURE DONE OF PANCREATITIS IN MY STUDY POPULATION IS CHOLELITHIASIS ( 55% )**

### **PROCEDURE DONE**

- Total no of patients who underwent laparoscopic cholecystectomy in my population is 40 cases which is 66.7 % of my population , followed by laparoscopic appendicectomy(28.3 % ) , laproscopic hernioplasty (3.3 %), diagnostic laproscopy and biopsy (1.7 %).
- **THE MOST COMMONEST LAPROSCOPIC PROCEDURE DONE IN MY STUDY POPULATION IS LAPAROSCOPIC CHOLECYSTECTOMY ( 55% )**

### **RISK FACTORS**

- Total no of patients who had history of smoking in my study population are 5 which is 5.0 % of my population , followed by obesity, previous history of deep vein thrombosis , rheumatic heart disease , varicose vein (1.7 %).
- **THE MOST COMMONEST RISK FACTOR IN MY STUDY POPULATION IS SMOKING ( 5% )**

### **COMORBIDITIES**

- Total no of patients who had history of Diabetes in my study population are 4 which is 6.7 % of my population , followed by diabetes and hypertensive (5%), hypertensive (5%), bronchial asthma , COPD (1.7 %).
- **THE MOST COMMONEST COMORBIDITY IN MY STUDY POPULATION IS DIABETES ( 4% )**

### **DOPPLER STUDY**

- Doppler study on day 1 shows DVT in 2 cases which is 3.3% of population
- Doppler study on day 3 shows DVT in 3 cases which is 5% of population
- Doppler study on day 10 shows DVT in 2 cases which is 3.3% of population

- **MOST COMMONLY DVT DIAGNOSED IN MY STUDY POPULATION IS ON POST OP DAY 3 HOSPITAL STAY**

*The average length of hospital stay is cases – 2.7 days*

### **BMI**

*The average body mass index in all cases is – 23.17 with standard deviation of 2.3*

### **INTRA ABDOMINAL CO2 PRESSURE**

*The average intra abdominal CO2 pressure in all cases is – 12.5 mmHg with standard deviation of 1.09*

**DURATION OF SURGERY**

*The average Duration of surgery in all cases is – 2.07 hours with standard deviation of 0.74*

**DESCRIPTIVE STATISTICS**

	N	Minimum	Maximum	Mean	Std. Deviation
S.no	60	1	60	30.50	17.464
AGE	60	16	75	38.28	15.874
BMI (kg / m2 )	60	18	31	23.17	2.337
Duration of hospital stay ( days )	60	2	5	2.70	.743
duration of surgery ( hours )	60	1	3	2.07	.482
intra abdominal CO2 pressure ( mm Hg )	60	11	15	12.58	1.094
Valid N (listwise)	60				

**III. Discussion**

The most important feature of laparoscopic surgery is the need to lift the abdominal wall from the abdominal organs. Two methods have been devised for achieving this. The first method used is to create pneumoperitoneum. In early twentieth century, intraperitoneal visualization of anatomy was achieved by inflating the peritoneum with air, using a sphygmomanometer bulb. The problem with using air insufflation is that nitrogen is poorly soluble in blood and is slowly absorbed across the peritoneal surfaces. Air pneumoperitoneum is believed to be more painful than nitrous oxide (N2O) pneumoperitoneum, but less painful than carbon dioxide (CO2) pneumoperitoneum. Subsequently, both CO2 and N2O were used for inflating the abdomen.

N2O had the advantage of being physiologically inert and rapidly absorbed. It also provided better analgesia for laparoscopy performed under local anesthesia when compared with CO2 or air. Despite initial concerns about N2O would not suppress combustion, controlled clinical trials have established its safety within the peritoneal cavity. In addition, N2O has been shown to reduce both the intraoperative end-tidal CO2 and minute ventilation required to maintain homeostasis when compared to CO2 pneumoperitoneum.

The effect of N2O on tumor biology and the development of port site metastasis are unknown. As such, caution should be there when performing laparoscopic cancer surgery with this agent. Finally, the safety of N2O pneumoperitoneum in pregnancy has yet to be elucidated. The physiologic effects of CO2 pneumoperitoneum can be classified into two areas: (a) gas-specific effects and (b) pressure specific effects

The pressure effects of the pneumoperitoneum on cardiovascular system also have been studied. In the hypovolemic state, excessive pressure on the inferior vena cava and a reverse Trendelenburg position with loss of lower extremity muscle tone may cause decreased venous return, cardiac output. This is rarely seen in the normovolemic patient. The most common arrhythmia by laparoscopy is bradycardia. A rapid stretch of the peritoneum often causes a vagovagal response with bradycardia and hypotension.

The appropriate management of such event is desufflation of the abdomen, administration of vagolytic agents (e.g., atropine), and adequate volume replacement. With the increased intra-abdominal pressure compressing the inferior vena cava, there is diminished venous return from the lower extremities. This has been well demonstrated in the patient placed in the reverse Trendelenburg position for upper abdominal operations. Venous engorgement and decreased venous return has chances to promote venous thrombosis. Many series of advanced laparoscopic procedures in which deep venous thrombosis (DVT) prophylaxis was not used demonstrate the frequency of pulmonary embolus.

This usually is an avoidable complication with the use of sequential compression stockings, subcutaneous heparin, or low molecular weight heparin. In short-duration laparoscopic procedures, such as appendectomy, hernia repair, or cholecystectomy, the risk of DVT may not be sufficient to warrant extensive DVT prophylaxis. The increased pressure of the pneumoperitoneum is transmitted directly across the paralyzed diaphragm to the thoracic cavity, creating increased central venous pressure and increased filling pressures of the right and left sides of the heart. If the intra-abdominal pressures are kept under 20 mmHg, the cardiac output usually is maintained normally.

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Dr. Manivannan MS, "A Study on the Incidence of Venousthromboembolism in Laproscopic Surgeries in Tertiary Care Centre". *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 17, no. 12, 2018, pp 48-51.