



## International Journal of Surgery Science

E-ISSN: 2616-3470  
P-ISSN: 2616-3462  
© Surgery Science  
www.surgeryscience.com  
2019; 3(4): 540-542  
Received: 22-08-2019  
Accepted: 26-09-2019

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### Assessment of lung functions, autonomic parameters in patients of cholecystectomy

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**DOI:** <https://doi.org/10.33545/surgery.2019.v3.i4i.721>

#### Abstract

**Background:** the patients after the surgical removal of gall bladder usually develops post-surgical complications like autonomic dysfunctions and respiratory dysfunctions.

**Objectives:** the present study was undertaken to determine and compare the respiratory and autonomic parameters in males and females patients after cholecystectomy.

**Methods:** The present study involved 30 patients of post cholecystectomy within the age group of 40 to 60 years of age from the general surgery departments. Breath holding time inspiration (BHT-i) and breath holding time expiration (BHT-e) and respiratory rate (RR) was assessed by standard methods available in the literature. Systolic and diastolic blood pressure and pulse rate were assessed using automated blood pressure instrument manufactured by Omron.

**Results:** breath holding time inspiration was significantly decreased in males when compared with females. There was no significant difference in breath holding time expiration among males and females. Respiratory rate was not significantly different among males and females. Similar results were observed for autonomic parameters. There was no significant difference observed in systolic blood pressure, diastolic blood pressure and pulse rate among males and females.

**Conclusion:** The study observed decline in the respiratory parameters and also altered autonomic parameters in both genders. However, there are no gender differences in these parameters. The study recommends more studies with involvement of multiple centers and more number of patients to understand the variations so that the treatment strategies can be well planned for the benefit of general population.

**Keywords:** Om chanting, stress, anxiety, depression, patients

#### Introduction

Cholecystectomy is the surgery where removal of the gall bladder. This is a small structure that is situated near the liver. The major function of gall bladder is to store the bile that is formed by the liver. This surgery is common but it is major surgery. However, it is involved with certain side effects especially difficult in the digestion of fat substances. Also it has some gastric complications like constipation and indigestion problems. In few patients there was appearance of jaundice as well. Also there is little weight gain observed in some patients. Further, the patients after the surgical removal of gall bladder usually develops post-surgical complications like autonomic dysfunctions and respiratory dysfunctions<sup>[1,4]</sup>. There was a decline in the forced vital capacity and vital capacity in the patients after the surgery which is most common observation<sup>[5]</sup>. To compensate this, respiratory system causes an increase in the rate and depth of respiration. However, there will not be any alteration in the minute ventilation<sup>[6]</sup>. In a similar way, there will be alterations in the autonomic parameters like blood pressure and pulse rate. Hence, assessment of the respiratory and autonomic parameters helps to plan the management strategies for these patients. Hence, the present study was undertaken to determine and compare the respiratory and autonomic parameters in males and females patients after cholecystectomy.

#### Materials and Methods

**Study design:** Observational study

**Sampling method:** Convenient sampling

**Study population:** The present study involved 30 patients of post cholecystectomy within the age group of 40 to 60 years of age from the general surgery departments. Both males (n=12) and females (n=18) were included in the study.

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Voluntary informed consent was obtained from all the patients before the study. Willing participants were included in the study. Patients with severe complications were excluded from the study.

**Assessment of lung functions:** Breath holding time inspiration (BHT-i) and breath holding time expiration (BHT-e) and respiratory rate (RR) was assessed by standard methods available in the literature [7].

**Assessment of autonomic functions:** Systolic and diastolic blood pressure and pulse rate were assessed using automated blood pressure instrument manufactured by Omron.

**Ethical consideration:** The study proposal was approved by an institutional human ethical committee. Informed consent was obtained from all the participants. Confidentiality of data was maintained.

**Data analysis:** Data was analyzed using SPSS 20.0 version. Student t-test was used to assess the significance of the difference between the groups.

## Results

The results were presented in Tables 1 to 2. The two-tailed P value equals 0.0011 for BHT-i. By conventional criteria, this difference is considered to be very statistically significant. The mean of Group One minus Group Two equals -8.00. 95% confidence interval of this difference: From -12.51 to -3.49. The two-tailed P value equals 0.0845 for BHT-e.

By conventional criteria, this difference is considered to be not quite statistically significant. The mean of Group One minus Group Two equals -4.00. 95% confidence interval of this difference: From -8.58 to 0.58. The two-tailed P value equals 0.4312. By conventional criteria, this difference is considered to be not statistically significant. The mean of Group One minus Group Two equals 1.00. 95% confidence interval of this difference: From -1.56 to 3.56. The two-tailed P value equals 0.0376 for systolic blood pressure. By conventional criteria, this difference is considered to be statistically significant. The mean of Group One minus Group Two equals -16.00. 95% confidence interval of this difference: From -31.01 to -0.99. The two-tailed P value equals 0.1144 for diastolic blood pressure. By conventional criteria, this difference is considered to be not statistically significant. The mean of Group One minus Group Two equals -9.00. 95% confidence interval of this difference: From -20.31 to 2.31. The two-tailed P value equals 0.2583 for pulse rate. By conventional criteria, this difference is considered to be not statistically significant. The mean of Group One minus Group Two equals 6.00. 95% confidence interval of this difference: From -4.65 to 16.65

**Table 1:** Respiratory parameters in male and female patients

Parameter	Males (n=12)	females (n=18)	P value
BHT-i	30±2.31	38±0.34	P = 0.0011**
BHT-e	28±1.73	32±1.41	P = 0.0845
Respiratory rate	12±0.58	11±0.94	P = 0.4312

Data was presented as Mean and SEM. (\*\*P<0.01 is significant)

**Table 2:** Autonomic parameters in male and female patients

Parameter	Males (n=12)	females (n=18)	P value
Systolic BP	144±6.35	160±4.24	P = 0.0376
Diastolic BP	92±4.62	101±3.30	P = 0.1144
Pulse rate	94±2.89	88±3.77	P = 0.2583

Data was presented as Mean and SEM.

## Discussion

The present study was undertaken to determine and compare the respiratory and autonomic parameters in males and females patients after cholecystectomy. There was decline in the breath holding time inspiration and expiration in both the genders. However, breath holding time inspiration was significantly decreased in males when compared with females. There was no significant difference in breath holding time expiration among males and females. Respiratory rate was not significantly different among males and females. Similar results were observed for autonomic parameters. There was no significant difference observed in systolic blood pressure, diastolic blood pressure and pulse rate among males and females. The study agree with earlier studies as there was similar results observed in the present study.

Earlier studies reported that there was decline in the respiratory muscle activity in the patients after the removal of gall bladder [8, 9]. Thus was explained in other study that the effect on the respiratory and autonomic parameters is due to administration of sedatives. These sedatives cause variations in the respiratory pattern and also the autonomic parameters [10]. Another possible explanation was that the abdominal pressure will vary after the surgery and it is well known that intra-abdominal pressure has immense role in the respiratory system. As there is alteration in the intra-abdominal pressure, there may be difficulty in the movements of diaphragm. This may be the reason for altered respiratory pattern [11]. Altered autonomic parameters also observed in the patients after removal of gall bladder [12]. Systolic and diastolic blood pressure variations were reported in patients with removed gallbladder [13, 14]. The present study results are in accordance with earlier studies.

## Conclusion

The study observed decline in the respiratory parameters and also altered autonomic parameters in both genders. However, there are no gender differences in these parameters. The study recommends more studies with involvement of multiple centers and more number of patients to understand the variations so that the treatment strategies can be well planned for the benefit of general population.

**Source of funding:** Self-funding

**Conflicts of interest:** None-declared

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