Turkish Journal of Geriatrics
2015;18(2):110-114

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RESEARCH

LAPAROSCOPIC CHOLECYSTECTOMY IN GERIATRIC PATIENTS

ABSTRACT

Introduction: Postoperative morbidity and mortality are more frequent among older patients due to reasons such as decreased organ function and accompanying disorders and malnutrition. Laparoscopic interventions in the elderly patients can also contribute to morbidity and mortality. The purpose of this study was to assess the safety of laparoscopic cholecystectomy in the aged and very aged patients.

Materials and Method: The patients were divided into three groups based on age. Groups 1, 2 and 3 comprised patients aged <65, 65–79 and ≥80 years, respectively. Each group included 50 consecutive patients who had undergone laparoscopic cholecystectomy.

Results: The groups were different from each other in terms of pre-operation albumin level, American Society of Anesthesiologist (ASA) score, existence of hypertension, coronary artery disease and chronic obstructive lung disease, duration of the operation, emergency operation ratio, morbidity rates. Morbidity was observed in 13 (8.7%) patients, with pulmonary complications in six, cardiac complications in five and infectious complications in two. There was no mortality in the study groups. The rate of morbidity was significantly higher in patients aged>80 years than other patients. Incidence of coronary artery disease, chronic obstructive pulmonary disease, low hemoglobin and albumin levels and high ASA score occurred more frequently in patients with morbidity. Logistic regression analysis showed that presence of chronic obstructive pulmonary disease and low albumin levels was associated with morbidity.

Conclusion: In the very aged patients, for whom cholecystectomy has been planned, laparoscopic cholecystectomy can be performed safely. However, laparoscopic cholecystectomy should be performed only after thorough patient evaluation and presurgical preparation because the most important factors associated with morbidity and mortality are co-existing disorders and nutritional status.

Key Words: Geriatrics; Cholecystectomy, Laparoscopic; Morbidity.

ARAŞTIRMA

YAŞLI HASTALARDA LAPAROSKOPİK KOLESİSTEKTOMİ

ÖZ

Giriş: Yaşlılarda azalış organ fonksiyonları, yandaş hastalıklar ve malnütrisyon sebebiyle operasyon sonrası morbidite ve mortalite gençlere göre daha yüksektir. Yaşlılarda laparoskopik girişimler morbidite ve mortaliteyi daha da arttırabilir. Bu çalışmanın amacı yaşlı ve çok yaşlı hastalarda laparoskopik kolesistektomi güvenliği değerlendirmektir.

Gereç ve Yöntem: Hastalar yaşlarına göre 3 gruba ayrıldı. Grup 1, 65 yaş altı, grup 2, 65-79 yaş arası, grup 3, 80 yaş ve üstü olarak belirlendi. Her grupta laparoskopik kolesistektomi uygulanan ardışık 50 hasta incelendi. Hasta dosyaları kayıt edilerek 3 grup arasında operasyon öncesi ve sonrası bulgular karşılaştırıldı.

Bulgular: Gruplar arasında operasyon öncesi albumin seviyesi, Amerikan Anestezistler Derneği (ASA) skoru, hipertansiyon varlığı, koroner arter hastalığı, kronik obstrüktif pulmoner hastalık, operasyon süresi, acil operasyon oranı ve morbidite sıklıkları farklı idi. Morbidite 13 hastada görüldü. Bunların 6'sı pulmoner, 5'i kardiyak ve 2'si enfeksiyöz komplikasyonlardı. Mortalite izlenmedi. Seksen yaş ve üzeri hastalarda morbidite diğer gruplardan yüksek idi (p=0,001). Kronik obstrüktif pulmoner hastalık varlığı, koroner arter hastalığı varlığı, düşük hemoglobin seviyesi, düşük albümin seviyesi, yüksek ASA skoru oranları morbiditesi yüksek hastalarda aha çoktu. Lojistik regresyon analizinde kronik obstrüktif pulmoner hastalık varlığı ve düşük albümin seviyesi morbidite ile ilişkili bulundu.

Sonuç: Eğer çok yaşlı hastalarda laparoskopik kolesistektomi planlandı ise bu girişim güvenle yapılabilir. laparoskopik kolesistektomi yapılacak ileri yaşlı hastalarda morbidite ile ilişkili en önemli parametreler yandaş hastalık ve beslenme durumu olduğu için hastalarının operasyon öncesi iyi değerlendirilmesi ve hazırlanması gereklidir.

Anahtar Sözcükler: Geriatri; Laparoskopik Kolesistektomi; Morbidite.

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Received: 12/03/2014

Accepted: 30/04/2015

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Introduction

As observed worldwide, Turkey has also experienced an increasing rate of life expectancy, leading to an increased ageing population. In Turkey, in the year 2000, the median age was 24.8 years and the rate of individuals aged 65 years and over was 5.7%, whereas in 2012, the median age was 30.1 years and the rate of individuals aged 65 years and over was 7.5%. It is predicted that in the years 2023 and 2050, the rates of individuals aged 65 and over would be 10.2% and 20.8%, respectively. For women and men, the expected life span was 79.2 and 74.7 years, respectively, in 2013 and it will be 80.2 and 75.8 years, respectively, in 2023 (1).

As the ageing population increases, the number of surgical interventions within this demographic also increases. However, postoperative morbidity and mortality are more frequent in the aged than in the younger population due to reasons such as decreased organ function and accompanying disorders and malnutrition (2,3). Laparoscopic interventions in elderly patients can escalate morbidity and mortality because of increases in intra-abdominal pressure that may negatively affect the respiratory system, circulatory system and intra-abdominal organs (4). The purpose of this study was to assess the safety of laparoscopic cholecystectomy (LC) in the aged and very aged patients.

Materials and Method

This retrospective study, which included aged patients who had undergone LC, was approved by Antalya Training and Research Hospital, Clinical Ethics Committees (52/6, 08.01.2015). The patients were divided into three groups based on age. For the purpose of our study, patients 65 years and over were considered 'aged'. Patients aged 80 years and over were separately grouped as very old patients. Groups 1, 2 and 3 comprised patients aged <65, 65–79 and ≥80 years, respectively. Each group included 50 consecutive patients who had undergone LC in our clinic. Time intervals for operations were years 2009 to 2014 in first group, years 2013 to 2014 in second group and year 2014 in the third group. Patients were operated by different surgeons.

The patients' files were retrospectively screened, according to the following criteria: sex; age; history of preoperative hypertension (HT), diabetes mellitus (DM), coronary artery disease (CAD), chronic obstructive pulmonary disease (COPD), cancer, any co-existing disorder, chronic renal insufficiency (CRI), myocardial infarction (MI) and previous abdominal surgery; hemoglobin, albumin, bilirubin, aspartate aminotransferase (AST) and creatine levels; ASA score; length of hospitalization; length of surgery; operational data; morbidity and mortality.

All obtained data were analyzed via the Statistical Package for Social Science (SPSS Inc., Chicago, USA) 18.0 software program. In comparing the groups, the Pearson's chi-square test and Fisher's exact test were used for the categorical data and the Kruskal–Wallis test and Mann–Whitney *U* test were used for numerical data. The logistic regression test was performed to find the factors affecting morbidity. Because there were three groups, in the Kruskal–Wallis test $p < 0.017$ was accepted as statistically significant, whereas in other tests, the $p < 0.05$ was accepted as statistically significant.

Results

The study included a total of 150 patients in three age groups: <65, 65 – 80, and >80. Distribution of patients according to age, sex and operational indications are presented in Table 1. The surgery was converted to open cholecystectomy in three (2%) patients due to acute cholecystitis with severe fibrotic adhesions in two patients and obscure anatomy in one patient.

Differences were observed among the groups in preoperative haemoglobin and albumin levels; ASA score; presence of HT, CAD and/or COPD; length of hospitalization and rate of emergency cholecystectomy and morbidity (Table 2).

Morbidity was observed in 13 (8.7%) patients, with pulmonary complications in six, cardiac complications in five and infectious complications in two. There was no mortality in the study groups. Morbidity rate was significantly higher in patients aged over 80 years than in the other patients ($P = 0.001$). The rates of COPD, CAD and low haemoglobin and albumin levels along with high ASA score were all found to be greater in patients with morbidity (Table 3). Logistic regression analysis showed that presence of COPD and low albumin levels were associated with morbidity (Table 4).

Discussion

In ageing population, there has been an increase in disorders such as cardiovascular disease, COPD and hypertension, negatively affecting the outcome of surgical interventions. Accordingly, there has been an increase in postoperative morbidity and mortality in the aged patients. With the introduction of laparoscopic interventions, it was accepted that this procedure increased complications in the elderly patients by inhi-

Table 1— Demographic Characteristics of the Patients.

	Group 1 (≤65 age)	Group 2 (66-79 age)	Group 3 (>80 age)	p
Age (mean)	45.3	71.0	84.1	0.001
Sex				
Women	42	34	36	0.160
Men	8	16	14	
Indicaiton of surgery				
Symptomatic Cholelithiasis	49	45	40	0.014
Acute Cholecystitis	1	5	10	

Table 2— Age-Related Differences Among the Groups.

	Group 1 (≤65 age)	Group 2 (66-79 age)	Group 3 (>80 age)	p
Hemoglobin (mg/dl) mean ± SD (range)	13.3±1,3 (10.0-16.5)	13.2±1,6 (9.9-16.6)	12.1±1.8 (7.9-16.6)	0.001
Albumin (mg/dl) mean ± SD (range)	4.1±0.2 (3.2-4.8)	3.8±0.3 (2.6-4.3)	3.3±0.4 (2.1-4.0)	0.001
ASA score (1/2/3/4/5)	36/13/1/0/0	3/35/12/0/0	2/23/21/4/0	0.001
HT	6	27	28	0.001
KAH	1	7	19	0.001
KOAH	1	2	7	0.016
Operation Time (min) mean ± SD (range)	38.7±23.1 (25-145)	60.8±26.7 (23-120)	63.8±35.0 (28-195)	0.001
Lenght of Hospital Stay (mean, day) (range)	1.4±0.7 (1-4)	2.0±1.7 (1-10)	2.2±1.4 (1-6)	0.001
Morbidity	-	2	11	0.001

Table 3— Factors Affecting Morbidity.

	Morbidity		p
	Yes	No	
Hemoglobin (mg/dl) mean ± SD (range)	11.1±2.1 (8.7-16.2)	13.0±1.5 (7.9-16.6)	0.001
Albumin (mg/dl) mean ± SD (range)	3.2±0.4 (2.3-3.8)	3.8±0.4 (2.1-4.8)	0.001
ASA score (1/2/3/4/5)	41/69/27/0/0	0/2/7/4/0	0.001
KAH (%)	46.2	15.3	0.014
KOAH (%)	38.5	3.6	0.001

Table 4— Morbidity-Associated Factors by Logistic Regression Analysis.

	p	Odds ratio
KOAH	0,003	16,777
KAH	0,444	1,811
Hemoglobin	0,092	0,671
Albumin	0,011	0,144

biting myocardial and pulmonary functions; therefore, such interventions had been contraindicated for the aged (5). With increased experience in laparoscopic surgery and better understanding of the pathophysiological changes that occur during laparoscopy, this conception was eliminated. The negative effect of laparoscopy on cardiac and pulmonary functions has been minimized by initiating a pneumoperitoneum under a pressure of <12 mmHg. With more experience, the duration of laparoscopic intervention has shortened. In addition, some studies have reported that cardiopulmonary complications are less common in laparoscopic interventions than in laparotomy (6,7). Therefore, laparoscopic interventions can be performed safely in the aged patients (5,8). Studies have shown that different procedures such as cholecystectomy, abdominal wall hernia repair, reflux surgery and colorectal operations can be performed safely with laparoscopy in the elderly as well (9-12).

The standard therapy for symptomatic gallbladder stone is LC. Compared with traditional open surgery, the advantages of LC include a shorter (and less expensive) hospital stay, earlier mobilization, less pain, less time away from work and better cosmetic outcomes(13). These benefits hold true for the elderly as well. As confirmed by our study, LC can be performed safely on patients aged 65 years and over. Although rate of morbidity and length of hospitalization in patients over 80 years were higher than those in the other groups, there was no mortality, proving that laparoscopic cholecystectomy could be safely performed. The most important factors determining morbidity and mortality in elderly patients, in addition to advanced age, are co-existing disorders and general health of the patient (5,10,14). Our study showed that presence of COPD and CAD along with a high ASA score are associated with morbidity. Hoekstra et al. (15) have reported that advanced age is not the only negative factor associated with surgical results but that co-existing disorders and immunocompromise are also responsible for increased rates of morbidity and mortality. Another factor affecting morbidity and mortality in the elderly is nutrition. Malnutrition increases postoperative complications by delaying wound healing and compounding infection risk (16). In our study, in the advanced age groups-those aged between 65 and 70 years and over 80 years-we found lower levels of albumin. Hence, low albumin levels, indicating malnutrition, were associated with morbidity. All of these mentioned factors may increase morbidity and mortality in elderly patients undergoing open surgery or LC. Leardi et al. (5) reported that morbidity and mortality rates in open surgery or LC were higher in patients aged over 80 years than those in patients aged 70–80 years. Accordingly, the risk of increased morbidity and mortality in elderly patients is not directly associated with the type of surgery, be it open or laparoscopic.

In conclusion, we suggest that, in very old patients, for whom cholecystectomy has been planned, LC can be performed. But high rates of mortality and morbidity of operation must be considered by the surgeon and patients must be informed about this high rates before the operation. LC should be performed only after the patient has been thoroughly evaluated and all presurgical preparations are completed, while considering that the most important factors associated with morbidity and mortality are co-existing disorders and nutritional status.

Acknowledgements

Thanks to Deniz Ozel from Akdeniz University, Department of Biostatistics for statistical analyzing.

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