The Impact of Nurse's Experience on Operation Time in Laparoscopic Cholecystectomy

Hemşire Tecrübesinin Laparoskopik Kolesistektomi Süresine Etkisi

Laparoskopik Kolesistektomi Süresi / Laparoscopic Cholecystectomy Operation Time

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Bu çalışma 11. Endoskopik ve Laparoskopik Cerrahi Kongresinde (2-6 EKİM 2013) sözlü olarak sunulmuştur.

Özet

Amaç: Çalışmamızda hemşire tecrübesinin laparoskopik kolesistektomi ameliyatının süresi üzerine etkisini belirlemeyi amaçladık. Gereç ve Yöntem: Konya Eğitim ve Araştırma Hastanesi genel cerrahi ameliyathanesinde, on yıldan daha fazla laparoskopik ameliyat tecrübesi olan, bir genel cerrahi uzmanının, Ocak 2010-2013 tarihleri arasında yaptığı laparoskopik kolesistektomi vakalarının dosyaları geriye dönük olarak tarandı. Ultrasonografide safra kesesinde taş ve/veya polipi olduğu için ameliyat edilen hastalar çalışmaya alındı. Hastaların yaş, cins, safra kesesi patolojisi, ASA skoru, ameliyatı asiste eden hemşire ve ameliyat süresine ait bilgiler elde edildi. Ameliyatı asiste eden hemşireler, laparoskopik ameliyat tecrübesi 10 yıldan fazla olan tecrübeli dört hemşire (grup 1), 5 yıldan az tecrübesi olan dört hemşire (grup 2) olarak iki gruba ayrıldı. Veriler Excel ortamında kaydedildi, istatistiki hesaplama için SPSS 18.0 programı kullanıldı. P<0.05 anlamlı kabul edildi. Bulgular: Çalışmamıza dahil edilen 197 hastanın 38(%19) i erkek, 159(%81) u kadın, 17(%9) si 65 yaş üstünde, 180(%91) i altında olup, yaş ortalaması 46,7±13,8 idi. Tecrübeli hemşireler 104(%53) ameliyatı, az tecrübeli hemşireler 93(%47) ameliyatı asiste etmişlerdi. Tüm ameliyatlar için ortalama ameliyat süresi 63,2±20,1 dakika idi. Bu süre tecrübeli hemşire grubunda 51,5±9,0 dakika, az tecrübeli hemşire grubunda 73,0±5,6 dakika olarak tespit edildi. Aradaki fark anlamlı (P<0.05) idi. ASA kriterleri ve hasta yaşının ameliyat süresi üzerine etkisi olmakla birlikte aradaki fark (P>0.05) anlamlı değildi. Tartışma: Laparoskopik kolesistektomide ameliyat hemşiresinin tecrübeli olması ameliyat süresini kısaltmaktadır.

Anahtar Kelimeler

Laparoskopik Kolesistektomi; Hemşire Tecrübesi; Ameliyat Süresi

Abstract

Aim: The objective of the present study is to determine the impact of nurses experience's on operation time in laparoscopic cholecystectomy(LC). Material and Method: Data collected retrospectively in Konya Training and Research Hospital, by reviewing the files of LC cases, between January 2010-2013, operated by general surgeon whom has more than ten years of experience in laparoscopic surgery. Patients who has gallbladder polyps and/or gallstones on ultrasonography were included in the study. Age, sex, gall bladder pathology, ASA score, duration of surgery and surgical nurse who assisted surgery were obtained from hospital automation system. Nurses were divided into two groups, (group 1) having more than 10 years of experience in laparoscopic surgery, (group 2) having less than 5 years experience in laparoscopic surgery. Statistical analysis was performed using SPSS v.18.0. P value less than 0.05 was considered statistically significant. Results: 197 patients included in the study, 38(19%) were male, 159(81%) were female, 17(9%) were above 65 years of age, 180(91%) were under 65 years of age, mean age of patients was 46,7±13,8 years. 104(%53) patients' operation was assisted by experienced nurses while 93(%47) patients' operation was assisted by less experienced nurses. Mean operation time was 51.5 ± 9.0 minutes in the group of experienced nurses and as 73.0 ± 5.6 minutes in the group of less experienced nurses, difference was statistically significant (P<0.05). Although ASA score and patient age had impact on operation time, difference (P> 0.05) was not significant. Discussion: Experienced surgical nurses reduce the operation time in (LC) surgery.

Keywords

Laparoscopic Cholecystectomy; Nurse's Experience; Operation Time

DOI: 10.4328/JCAM.2276 Received: 05.01.2014 Accepted: 20.01.2014 Printed: 01.09.2015 J Clin Anal Med 2015;6(5): 611-613
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Introduction

Today, laparoscopic cholecystectomy (LC) has become the 'gold standard' surgical technique for benign pathologies of gallbladder such as gallstones and gallbladder polyp [1]. Return to normal life after LC is faster due to less invasive surgical technique and shorter operation time. Surgeon's manipulation of hand tools, compliance with the anatomical structure, recognition of laparoscopic system and the ability to manage increases with experience in LC. Experience of the surgeon is the most important factor in the success of LC surgery and completing the operation in a short time. Another important factor is the laparoscopy experience of allied health personnel [2].

Especially in cases with high risk of conversion to an open procedure, operating theatre conditions and allied health personnel competency have impact on operation time and on the succesfull completion of the surgery laparoscopically. The mean operating room times differ by 50% among hospitals in different countries for LC is also confirmed by Dexter et al [3]. The longer operation time will cause more exposure to the anesthetic drugs, prolongation of hospital stay and an increase in cost of surgery.In our study we aimed to determine the impact of operating room nurses who served as the first assistance in LC surgery on operation time experience.

Material and Method

Data was collected retrospectively in Konya Training and Research Hospital, by reviewing the files of LC cases, between January 2010-2013, operated by general surgeon whom has more than ten years of experience in laparoscopic surgery. In order to create a standard group, patients who has undergone surgery for bening gallbladder polyps and / or gallstones on ultrasonography were included in the study .

Cases having a gallbladder wall thickness greater that 3 mm in ultrasonography, haveing the incision scar above the navel and around the navel, that have added a second operation to gallbladder surgery, that have started laparoscopically but converted to an open procedure and where general anesthesia can not be applied due to the high risk are excluded from the study.

The data related to the patients' age, sex, gall bladder pathology, American Society of Anesthesiology (ASA) risk score, duration of surgery and surgical nurse who assisted surgery were obtained from the patient's files in the hospital automation system. All the patients were operated under general anaesthesia. For all patients; anaesthesia was induced with propofol 2.0–2.5 mg kg − 1 , fentanyl 3–4 μg kg − 1 and Rocuronium 0.6 mg kg−1 was used to facilitate tracheal intubation. Anesthesia was maintained with sevoflurane. All patients received mechanical ventilation with a mixture of nitrous oxide (50%) in oxygen (fresh gas flow rate = 3 L/min).

We completed LC using four port conventional laparoscopic technique in all the cases. Pneumoperitoneum was created with Veress needle and a 10-mm trocar was placed in the umbilicus. Another 10-mm trocar was placed in the midepigastrium just to the right of the falciform ligament, and 5-mm trocars were placed in the right upper abdomen two fingerbreadths below the right coastal margin in the midclavicular line, Another 5-mm trocar was placed in the subcostal region at the level of anterior axillary line.

While the nurse working as the first assistance showed working area with the camera , the auxiliary nurse pushed the gallbladder from the fundus and the surgeon performed the cholecystectomy operation with working tools (equipment) in both hands. Nurses who have assisted surgery were divided into two groups, (group 1) having four nurses with more than 10 years of experience in laparoscopic surgery, (group 2) having four nurses with less than 5 years experience in laparoscopic surgery. Operation time was calculated by analyzing the anesthesia record. Time starting from the first incision at the beginning of the operation to the last skin suture at the end of the operation was considered as operation time. The impact of nurse experience on operation time was evaluated. Statistical analyses were performed using SPSS (Statistical Package for Social Sciences) v.18.0. Chi-square test was used in the analysis of categorical data and student-t test was used in the analysis of continuous data , P value of <0.05 was considered significant.

Results

Among the 197 patients' included in the study, 38 (19%) were male, 159 (81%) were female, 17 (9%) were above 65 years of age, 180 (91%) were under 65 years of age, while the mean age of patients was 46,7±13,8 years. ASA risk score showed that 146 (74%) patients were ASA I, 38 (19%) were ASA II, and 13 (7%) were ASA III. There were four general surgery operating tables in the operating room. . There were two nurses on each operating table where one was experienced and the other was less experienced. Experienced and less experienced nurses participated alternately to the LC surgery as the first assistance. 104(%53) patients' operations were assisted by experienced nurses while 93(%47) patients' operations were assisted by less experienced nurses. Mean operation time for all operations was 63.2 ± 20.1 minutes. Mean operation time was detected as 51.5 ± 9.0 minutes in the group of experienced nurses and as 73.0 ± 5.6 minutes in the group of less experienced nurses. The difference was statistically significant (P=0.001). Although ASA clasifications and patient age had an effect on operation time, the difference (P> 0.05) was not significant. (Table 1).

Table 1. Characteristics of patients who underwent laparoscopic cholecystectomy

	Group 1 (n=104)	Group 2 (n=93)	p Value
Operation Time	51,5±9,0	73,0±5,6	<0,001
Gender			>0,05
Female(%)	85(82)	74(80)	
Male(%)	19(18)	19(20)	
Age	46,8±11,7	46,5±14,8	>0,05
ASA Risk Score	1,9±0,9	1,8±0,8	>0,05

Discussion

The importance of operation time is increasing due to a better understanding of the relative impact of performance monitoring, effective resource allocation and quality of patient care. Operation time is the result of a complicated relationship between patient and health care providers. It is unknown whether the longer surgery duration due to meticuluos attention to technique and intraoperative difficulty increases or decrea-

ses the intraoperative and postoperative complications. Similarly, whether a smooth intraoperative period and high experience or potentially less attention to details will represent the short operation time is not certain.

Studies have shown that mean operation time in the first years of LC ' s implementation was around 2 hours while this decreased over time and has reduced to 30 minutes. The increase in the surgeon's experience has impact in reducing the operating time [4]. Explaining these positive changes just by experience is not adequate. Namely, The use of advanced tools and systems in recent years has shortened the operation time, decreased blood loss and complications [5-6]. Verdaasdonk et al. showed that use of a checklist was feasible and helped to reduce problems with the laparoscopic technical equipment in the operating room [7]. Working with a fixed team on similar consecutive cases in the operating room is an important factor which results in lower turnover times and preparation times which may have beneficial effects on patient outcome [8]. Analysis of team interactions is feasible and valuable, yielding important insights into relationships between nontechnical skills, technical performance, and operation duration [9]. Kahramansoy et al. In his study wtih 427 patients with LC; concluded that improvement of factors such as operating room equipment and auxiliary health personnel qualifications shortens the operation time in LC [1].

Placement of access ports to the abdominal wall, to clarify the image in the abdomen and wound closure corresponds to 23% of the operation time. Presence of an experienced nurse contributes to reduce this time by half [10]. In our study LC surgery duration was 51.5 ± 9.0 minutes in experienced nurse group and 73.0 ± 5.6 minutes in less experienced nurse group. The difference was statistically (P = 0.001) (Table 1). The mean operation time in our series was comparable with that reported by a multicenter study in the USA [11].

The number of complications increase as the duration of surgery increases. When the operation time is prolonged over 2 h, the risk for perioperative complications is four times higher compared with an intervention that lasts for less than 60 min [12]. In case of prolonged operation duration in patients undergoing laparoscopic surgery, it is noted that postoperative symptoms of drowsiness or dizziness increased with the duration of anaesthesia [13] and there was a positive correlation with the total amount of CO2 used and the duration of drowsiness [14] Incidence of postoperative emetic symptoms incresead with the duration of anaesthesia [15]. Postoperative nausea and vomiting can lead to delayed postanaesthesia care unit recovery room discharge and unanticipated hospital admission, thereby increasing medical costs and also affects degree of patients' satisfaction, comfort and quality of life.

Due to the retrospective nature of our study;

1. No relationship between operation time and postoperative complications could be identified.
2. The impact of the factors that affect operation time in laparoscopic surgery such as, preoperative table preparation time, condition of equipment (new or not) could not be evaluated due to not being able to access recordings

Conclusion

1. In LC the surgery nurse's experience reduces the operation time.
2. Since laparoscopic surgery is a team work training of all the team is critical. Training programs and courses with the purpose of increasing information on the implementation of laparoscopic surgery, laparoscopic equipment provision and sterilization, updating information on the new technologies and how they are used would be beneficial in training operating room nurses and allied health personel.
3. There is a need for prospective controlled study in order to determine the types of complications and the amount of cost increase resulting from prolongation of surgery duration in LC surgery.

Competing interests

The authors declare that they have no competing interests.

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How to cite this article:
Kozanhan B, Eryılmaz MA, Başaran B, Ay S, Özmen S. The Impact of Nurse's Experience on Operation Time in Laparoscopic Cholecystectomy. J Clin Anal Med 2015;6(5): 562-4.