Risk of Bacteremia Following Laparoscopic Cholecystectomy

LAPAROSKOPİK KÖLESİSTEKTOMİYİ TAKİBEN BAKTERİEMİ RİSKİ

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Summary

In this prospective study, the incidence of bacteremia after laparoscopic cholecystectomy in comparision with open cholecystectomy was detected. 120 adult patients with chronic calculos cholecystitis were analysed. They were divided in two groups according to the procedure performed. The first was the laparoscopic cholecystectomy group (LC) composed of 80 patients and the second was the open cholecystectomy group (OC) composed of 40 patients. Both groups were similar regarding age, sex and reason for hospital admission. The search for bacteremia was done by drawing sequential blood cultures preoperative!)' and within 5 and 30 minutes of the procedure. The incidence of bacteremia was not different between the two procedures, but types of microorganisms were different. It was found that all bacteremias after LC were associated with coagulase-negative Staphylococci(CoNS), whereas E.coli was the recovered organism from two episodes of bacteremia after OC. In conclusion it was thought that open cholecystectomy should always be performed with antimicrobial prophylaxis, though its value for LC could not be adequately documented, in the absence of certain host risk factors.

Key **Words:** Laparoscopic cholecystectomy, Open cholecystectomy, Bacteremia

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Özet

Bu prospektif çalışmada; kronik taşlı kolesistiti olan 120 erişkin hastada, açık kolesistektomi (AK) ile karşılaştırılarak laparoskopik kolesistektominin (LK) neden olduğu bakteriemi sıklığı incelendi. Hastalar uygulanan yönteme göre iki gruba ayrıldı. Birinci grup 80 hastadan oluşan LK, ikinci grup 40 hastadan oluşan AK grubu idi. Her iki grup yaş cinsiyet ve hastaneye başvuru şikayetleri yönünden benzerlik gösteriyordu. Bakterieminin araştırılması, preoperatif ve işlemin başlamasından sonraki 5 ve 30. dakikalarda alınan bir seri kan kültürleriyle yapıldı. Bakteriemi sıklığı iki yöntem arasında bir farklılık göstermezken izole edilen bakteri tipi farklıydı. LK sonrası oluşan bakteriemilerin hepsinden coagulase-negative Staphylococci (CoNS) sorumlu iken, AK sonrası oluşan bakteriemilerin ikisinde E. coli'nin sorumlu ajan olarak ürediği tespit edildi. Sonuç olarak, AK'nin her zaman anümikrobialprofilaksi ile yapılması gerekirken, belli risk faktörleri bulunmayan LK yapılacak hastalarda profilaksinin önemi gösterilememiştir.

Anahtar Kelimeler: Laparoskopik kolesistektomi, Açık kolesistektomi, Bakteriemi

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Subsequent to the first endoscopic cholecystectomy performed in 1987, laparoscopic surgery has increasingly been used in general surgical clinics (1). Less pain, shorter hospitalization, earlier resumption of activity and improved cosmesis have made laparoscopic surgery very popular (2).

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Changes in surgical practises from invasive to minimally invasive, have also changed the concept of prophylactic antibiotic therapy (3,4). As the incidence of postoperative wound infection following open surgery seems to be lower after laparoscopic surgery, the prevention of more localized infective complications within the abdominal wall and blood stream seems to be more important than the prevention of wound infection (5,6).

It is known that any endoscopic and surgical procedure that incises or penetrates a body surface or cavity colonised with bacteria may cause tran-

sient bacteremia (7). Transient bacteremia rarely persists for more than 15 minutes and rarely causes septic morbidity (8). The significance of transient bacteremia for a given procedure is the propensity of bacteria and the host factors (9).

Although in the case of any surgical procedure there must be critical assessment of the related complications, reports regarding the incidence of bacteremia after laparoscopic cholecystectomy in comparison with open cholecytectomy.

Material and Methods

This prospective study was conducted at the Hospital of Gazi University, Medical School, General Surgery Department, between 1996-97.

120 adult patients with chronic calculous cholecystitis, undergone laparoscopic cholecystectomy (LC) or open cholecystectomy (OC) were entered into this study. Excluded from the study were patients with acute and / or perforated cholecystitis, those using or those who had used systemic antibiotics within the previous 48 hours and those having signs of infection.

These 120 patients were divided into two groups according to the procedure. The LC group composed of 80 patients and OC group composed of 40 patients.

In the LC group there were 55 women, 25 men ages ranging from 28 to 71 (mean:51.2). In the OC group there were 26 women, 14 men ages ranging from 24 to 67 (mean:49.9) years. Both groups were similar regarding age, sex and reason for hospital admission.

After indwelling a peripheral venous catheter and inducing general anesthesia, blood cultures were taken perioperatively and at 5 and 30 minutes after beginning the surgical procedure. Skin was disinfected with 70% isopropylalcohol followed by povidine-iodine. Five milliliters of blood was drawn from an antccubital vein and quickly inoculated into blood culture bottles for aerobic microorganisms (Bactec). Bottles were incubated for seven days and read using a Bactec 460.

Statistical analysis of the data was carried out using the chi-square test. A p-value of less than 0.05 was considered to be statistically significant.

Table 1. Incidence of cases with bacteremia and type of procedure.

Blood culture time (Min. after start)	Incidence (n,%) LC	OC	p value
0	8/80(10)	3/40(7.5)	p>0.05
5	6/80(7.5)	3/40(7.5)	p>0.05
30	8/80(10)	5/40(12.5)	p>0.05

Results

Results of perioperative blood cultures were positive in eight of the 80 patients in the LC group (%10) and in three of the 40 patients in the OC group (7.5%). In all cases coagulase-negative Staphylococci (CoNS) was recovered from positive cultures. Blood cultures taken at 5th minute were positive in six of the 80 patients in the LC group (7.5%) and in three of 40 patients in the OC group (7.5%) and all grew CoNS. The results of blood cultures taken at 30th minute were positive in eight of the 80 patients in the LC group (10%) and in five of the 40 patients in the OC group (12.5%). In the LC group CoNS were isolated from all the positive blood cultures whereas in the OC group three of them yielded Esherichia Coli (Table 1). Among the patients with positive blood cultures, none had clinical manifestation of infection.

There was no statistical difference in the incidence of bacteremia at 0, 5 and 30 minutes between the two groups. Howewer in the OC group two of the positive blood cultures taken at 30th minute grew E.Coli.

Discussion

Laparoscopic cholecystectomy is a new method that has rapidly become popular as it is essentialy a safe procedure with low morbidity and mortality (10). Also it seems to reduce the incidence of postoperative wound infections of invasive techniques because it is a minimally invasive technique. An incidence of wound infection of 1.2% - 7% that may be expected after open cholecystectomy, is less common after a laparoscopic operation (0.9-1.3%) (5,11). However there is some theoretical concern that increased abdominal pressure during laparoscopic surgery may cause en-

hanced bacteremia (12). However, there is little data from experimental studies available, and some is controversial (12,13).

In this postoperative study, the incidence of bacteremia was not found to be different between laparoscopic and open cholecystectomy methods.

In any bacteremia study, the question of skin contamination is important. Therefore, baseline blood cultures and sequential multiple blood cultures were taken from all patients to maximize the sensitivity of the cultures. It is shown by studies that peak bacteremia rates occur within 5 minutes of the procedure, that generally lasts for 15 to 30 minutes (14). In this study, the decision to obtain cultures at 5 and 30 minutes of the procedure was made, so any transient bacteremia could not be missed.

In all cases with positive preoperative blood cultures, the recovered microorganism was CoNS which was thought to reflect skin contamination. However the presence of positive cultures at 5 and 30 minutes after the procedure strongly supports the supposition that the data truely represents episodes of transient bacteremia.

The organism associated with transient bacteremia reflects the resident microbial flora at the manipulated site (15). In this study the microorganisms isolated from sequential blood cultures were mostly CoNS which were thought to have originated from the skin surfaces of patients.

In two episodes of bacteremia in the OC group at 30 minutes after the procedure, the identified microorganism was E.Coli. Although normally the biliary tract is sterile, about 80% of those persons with cholelithiasis had biliary tract colonization and E.coli was among the most common colonizing organisms (16).

Although no patients reported clinical manifestations of bacteremia, we cannot exclude the possibility that bacteremia may have developed after 30 minutes as blood cultures were not obtained after that period.

In conclusion, the results showed that episodes of bacteremia occurred were transient and completely asymptomatic following both type of surgery. Though the incidence was not different between the two types of procedures, the type of the organism was different. In laparoscopic cholecystectomy all the bacteremias were associated with CoNS. So it was thought that antibiotic prophylaxis seems to be indicated with certain risk factors such as immunosupression, certain cardiac diseases, prosthetic joints, vascular grafts and shunts for the prevention of septic morbidity (14,17). However, in open cholecystectomy two episodes of bacteremias were associated with E.coli, which is one of the leading causes of nosocomial bacteremia, which encouraged the suggestion that open cholecystectomy should not be performed without antimicrobial prophylaxis as indicated before (4.18).

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