Hemodynamic Effects of Pneumoperitoneum During Laparoscopic Cholecystectomy: a Prospective Comparative Study using Bioimpedance Cardiography


Introduction

Laparoscopic cholecystectomy with pneumoperitoneum has become the preferred method of cholecystectomy at most centres. An increase in intra-abdominal pressure by pneumoperitoneum produces a variety of alterations in cardiovascular and pulmonary function. The purpose of this study was to assess prospectively the haemodynamic effects of increased intra-abdominal pressure during laparoscopic cholecystectomy and to compare them with changes occurring during open cholecystectomy.

Methods

Patients undergoing cholecystectomy between March and September 1993 were studied. Type of surgical procedure was determined by patient preference. All patients were classified as grade I according to the scoring system of the American Society of Anesthesiologists. Bioimpedance cardiography was used for monitoring at predetermined time intervals during the surgical procedure.

Results

There were 22 patients that underwent laparoscopic cholecystectomy, as compared to 11 patients undergoing open cholecystectomy. In the laparoscopy group, stroke volume, cardiac and ejection velocity indices were significantly decreased and the total peripheral resistance index was significantly increased during the insufflation period when compared with preinsufflation and corresponding values in the group undergoing open operation. Routine intraoperative parameters such as heart rate and blood pressure did not show any significant change in cardiovascular performance during laparoscopic procedures.

Conclusion

Continuous non-invasive cardiovascular monitoring by bioimpedance cardiography may be useful in patients with limited cardiac function.