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Risk factors for cardiac complications during anesthesia for laparoscopic cholecystectomy video

Summary

A prospective longitudinal cohort study was conducted in 470 patients undergoing surgery for gallstones by laparoscopic surgery provincial Hospital "Carlos Manuel de Céspedes in Bayamo, from the Cauto region during the period January 2012 to December 2014, with the aim to identify risk factors hypothetically related to the occurrence of intraoperative cardiorespiratory complications during anesthesia. The exposed cohort consisted of 147 patients who developed complications; Primary information was obtained from the medical records of operated patients. He also performed with each hypothetically influential factor, estimates of relative risk (RR) and confidence intervals 95% (95%) and hypothesis testing chi-square. Age, hypertension, ischemic heart disease were identified as the most important risk factors in the occurrence of cardiac complications in anesthesia for laparoscopic cholecystectomy video.

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Introduction

Gallstones are the most common cause of abdominal pain for admission to hospitals in developed countries and constitutes an important public health spending. In the United States it is estimated that 20 million people have gallstones. An estimated 5.5 million of them have gallstones in the United Unido.[1] The first description of bile duct stones in humans was made by Alexander of Tralles (525-605 AD). However, it is also described in the Ebers Papyrus, discovered by George Ebers in 1862. Andreas Vesalius (1514-1564) in his factory humanicorporis (Basel, 1543), it concluded that cholelithiasis is a disease. He also described the anatomy of the bile duct. Jean Louis Petit, in early 1700, introduced the term '' biliary colic" and suggested drain abscesses when the gallbladder was attached to the abdominal wall. At that time only patients who luckily had developed external fistulas and abscesses were saved. Treatment consisted of cholecystitis belladonna, morphine and hot springs. The emergence from anesthesia (1846) and antisepsis (1867) made it possible to develop biliar.[2]

In 1987, Phillips French gynecologist Mouret performed the first laparoscopic cholecystectomy video in France, which inspired other French surgeons Perissat as Dubois and, in 1988, who independently developed the technique for laparoscopic cholecystectomy, this spread rapidly through Europe and United States and it is now considered the method of choice for the treatment of colelitiasis.[1] In Latin America, Venezuela was Dr. Luis Ayala to perform the first laparoscopic cholecystectomy. Thus the era of laparoscopic cholecystectomy started in Europe and Latin America, which in a short time the revolutionary practice of general surgery worldwide.[3]

In our country this operative method, commonly called "minimum access" began to be practiced in as early as 1991 in the "Hermanos Ameijeiras" Hospital. Thereafter there was a rapid spread of such good practice throughout the country, which today is the choice for the realization of such intervention and endoscopic retrograde mainly to some of its complications such as stones coledociana.[4,5] Parallel to this surgical revolution, anesthesiology has had to be updated, studying the pathophysiology which produces CO_2-induced pneumoperitoneum, and how this will disrupt the normal homeostasis of the patient (in the different systems of the body). It is the responsibility of the anesthesiologist when administering anesthesia for laparoscopic surgery, making early diagnosis of changes that they produce physiological carboperitoneo to give the appropriate timely treatment; and thus avoid the deleterious effects of CO_2 in the patient: Above all, the effects of this CO_2 in the normal respiratory physiology, to avoid irreversible metabolic disorders in the patient.

All these alterations of homeostatic systems that produce CO_2, depend on the duration of surgery, and the positions to be given to the patient: Trendelenburg or reverse Trendelenburg. The anesthesiologist has constantly endeavored to provide safe anesthesia to these surgeries "minimum access" where "Maximum Invasion" There homeostasis normal.[6] There are consequences that are caused by certain peculiarities of surgical or anesthetic technique. The anesthesiologist is responsible for early diagnosis and treatment to reduce surgical morbidity and mortality of these patients. Although there are various studies related to different types of complications: intraoperative and postoperative that may occur during this surgical procedure, however there are insufficient studies on the risk factors that predispose to intraoperative cardiorespiratory complications during anesthesia for laparoscopic cholecystectomy, delimiting as a scientific problem: What are the risk factors related to the occurrence of cardiac complications during anesthesia for laparoscopic cholecystectomy?

It starts from the assumption that: age, hypertension, ischemic heart disease, heart failure, obesity, cigarette smoking, asthma, chronic obstructive pulmonary disease and bronchitis, are risk factors for intraoperative appearance of cardiac complications during anesthesia for laparoscopic cholecystectomy. The identification of a group of risk factors for the occurrence of cardiac complications, is undoubtedly the greatest contribution of this research, which will allow a more objective assessment of patients undergoing this procedure, in order to reduce the occurrence complications during anesthesia.

Goals

General: Identify the risk factors associated with the development of intraoperative cardio respiratory complications during anesthesia for laparoscopic cholecystectomy.

Specific

I. Identify the association between age General characteristics of research.

i. A prospective cohort study was conducted in surgically treated patients with the diagnosis of gallstone laparoscopic surgery video in the "Carlos Manuel de Céspedes in Bayamo, from the Cauto region during the period January 2012 to December 2014 provincial hospital.

II. Selection of the universe and shows.

i. Universe

a. The universe consisted of 470 patients operated on in the living minimum access University Hospital "Carlos Manuel de Cespedes" of Bayamo, Granma, Cuba in the aforementioned period.

ii. Sample

a. To calculate the size of the final shows a prospective cohort study was designed.

b. Starting from the universe of a probability sample study and selection of the cohort was performed by simple random sampling was taken.

c. Establishing a factor prevalence of exposure in the non-sick group and 33% in the patient group of 23% with 95% confidence coefficient equals 0.05 level of significance of the error, with an output of 80 (1-β).

d. It was established that the exposed cohort consisted of 147 patients who developed complicccc8aciones in the study period and met the inclusion criteria.

To calculate the sample size the statistical package EpiInfo 2002 version for Windows was used. Selecting the exposed cohort: consecutively included all patients undergoing surgery elective gallbladder and classified as ASA14 I and II in the lounge laparoscopic surgery, who presented intraoperative findings of cardiac complications during anesthesia for laparoscopic cholecystectomy. Exclusion criteria in the cohort of patients: patients who begin after laparoscopic cholecystectomy have to convert conventional route (open) were excluded.

Monitoring of patients in the cohort

All patients who were going to intervene on the Friday before the week of the surgery, with questioning of personal medical history and at that time they were compensated medication at that time was taking anesthesia consultation was carried out and if necessary suspend some or keep it until the day of intervention, assessing complementary tests were within normal limits suggest mediate and immediate preoperative medication with antacids if necessary, antisialogogues and sedatives, indicate general anesthesia for all patients.

In the operating room after performing noninvasive patient monitoring by DOCTUS VII monitor, with heart rate, blood pressure, respiratory rate, pulse oximetry, continuous electrocardiography in DII lead and CO_2 exhaled. Then proceed to the induction of anesthesia with propofol to 2 mg per kg of weight, atracurium 0.5 mg per kg of weight, 5 mcg fentanyl kilograms, then becomes laryngoscopy and intubation. both well-ventilated lung fields is checked and engages anesthesia machine in volume controlled ventilation; Tidal volume is calculated to 7 ml per kg of weight, anesthetic gases open, deepens narcosis with fentanyl to 10 mcg per kilos, it proceeds to perform in capnoperitoneum, an intra abdominal pressure until 12mmHg for endoscopic visualization that enables procedure the surgical technique chosen by the surgeon, which starts with the change of position, basically inverted Trendelenburg and slight tilt to the left. During the anesthetic-surgical procedure they will describe the occurrence or absence of intraoperative cardio respiratory complications that concern us in this investigation.

Operational definition of variables

They were defined as independent or explanatory variables hypothetically study the factors associated with the development of intraoperative cardiac complications, which would be under observation. As the dependent variable the presence or absence of intraoperative cardio respiratory complications was considered. We considered, to define a patient with intraoperative cardio respiratory complications, the following criteria:

a. Cardiac tachycardia or bradycardia; hypotension and hypertension; occurrence of malignant arrhythmias, deep vein thrombosis, acute myocardial ischemia and cardiac arrest.

b. Respiratory: Hypercapnia and hypocapnia; barotrauma; aspiration; pneumomediastinum; pneumothorax, hypoxia maintained, increased P1 (peak pressure), (P2) plateau pressure gas embolism.

The diagnosis of cardiac evaluation was performed intraoperative complications throughout the surgical procedure and usually by two specialists Anesthesiology unison. One was that the patient initially intervened when the initial assessment was conducted. Thus ascertainment bias in the study was prevented.

Statistic analysis

Univariate analysis

It was performed with each hypothetically influential factor, estimates of relative risk (RR) and confidence intervals 95% (95%). In the variables in the relative risk was significantly greater than 1, hypothesis testing chi-square was performed with a significance level of p less than 0.05. The hypothesis that the population was significantly higher RR 1, to be considered risk factor was tested.

Multivariate analysis

To determine the independent influence of each factor they were present when a group of them, a multivariate analysis was performed with binary logistic regression technique. Quantified variables appearing in absolute values and percentages, contingency coefficient was calculated to evaluate statistically the relationship between the variables. In all cases statistical significance level equal to 95% was selected. Adjusting the logistic regression function, equivalent to the estimated parameters it was performed by the method of maximum likelihood. Statistical goodness of fit of Hosmer-Lemeshow was also applied to evaluate the goodness of fit.

For the development of the research was carried out with informed consent Appendix (Appendix 1 & 2) patients and/or their families to participate in it, respecting their rights and the individual, and respect

for their welfare, so that He offered the necessary information that allowed him to decide if he participated in the execution of the tasks of research to their own status and will. The data were taken from practice and not tampering or therapeutic measures were tested in patients. Data confidentiality is respected.

Results

A total of 470 patients undergoing laparoscopic cholecystectomy, 147 (31.28%) developed cardiac complications. Table 1 shows that age above 65 years significantly increased the risk of cardio respiratory complications. (RR 2.091, 95% CI: 1.269 -3.44; p = 0.004). However, obesity and smoking did not increase this risk during surgery (RR 1.881; 95% CI 0.961 to 3.681; p = 0.065) and (RR 1.593; 95% CI 0.815 to 3.114; p = 0.173) respectively. It is evident that both hypertension (RR 2.997; 95% CI 1.994 to 4.505; p = 0.000) and ischemic heart disease (RR 3.500; 95% CI 1.399 to 8.757; p = 0.007) increased the risk of complications cardio respiratory significantly, as shown in Table 2.

Table 3 shows the multivariate analysis, where it was found that the more independent influence factor for the occurrence of cardiac complications was hypertension (; -; p = 0.000 4,023 95% 1,696 2,612 RR) is collected. Obesity also increased to more than twice the risk (RR 2.169, 95% CI 1.080 to 4.355; p = 0.030).

Table 1 Risk factors for cardiac complications during anesthesia for laparoscopic cholecystectomy video. Age, obesity, smoking. Carlos Manuel de Céspedes Hospital Univariate analysis

Risk Factor		Exposed(147)		Unexposed (323)		Total (470)		RR	IC (95 %)	Probability
		No	%	No	%	No	%			
Age	≥ 65	35	23,8	42	13,0	77	16,4	2091	1,269-3,44	0,004
	< 65	112	76,2	281	87,0	393	83,6			
Obesity	Si	17	11,6	21	6,5	38	8,1	1881	0,961-3,681	0,065
	No	130	88,4	302	93,5	432	91,9			
Smoke	Si	131	89,1	300	92,9	431	91,7	1593	0,815-3,114	0,173
	No	16	10,9	23	7,1	39	8,3			

Table 2 Influence of comorbidity on the appearance of cardiac complications during anesthesia for laparoscopic cholecystectomy video Univariate analysis

Risk Factor		Exposed(147)		Unexposed (323)		Total (470)		RR	IC (95 %)	Probability
		No	%	No	%	No	%			
Hypertension	Si	76	51,7	85	26,3	161	34,3	2997	1,994-4,505	0,000
	no	71	48,3	238	73,7	309	65,7			
Ischemic heart disease	Si	12	8,2	8	2,5	20	4,3	3500	1,399-8,757	0,007
	no	135	91,8	315	97,5	450	95,7			
Heart failure	Si	2	1,4	3	0.9	5	1,1	1471	0,243-8,900	0,674
	no	145	98,6	320	99,1	465	98,9			
Asthma Broquial	Si	7	4,8	15	4,6	22	4,7	1027	0,410-2,574	0,955
	no	140	95,2	308	95,4	448	95,3			
EPOC	Si	2	1,4	4	1,2	6	1,3	1100	0,199-6,074	0,913
	No	145	98,6	319	98,8	464	98,7			

Table 3 Model of multinomial logistic regression. Multivariate analysis

Risk factor	Probability	RR	IC (95,0 %)
Age greater than or equal 65th	0,178	1457	0,842 – 2,521
Hypertension	0,000	2612	1,696 – 4,023
Ischemic heart disease	0,118	2164	0,823 – 5,689
Obesity	0,030	2169	1,080 – 4,355

Discussion

It has been shown that the prevalence of gallstones is directly related to the passage of age. At 75 years 1 in 3 people may have gallstones, and 90 years may be present in up to 80%. Magnuson has shown that older people are more likely than younger people to suffer acute cholecystitis (40% vs. 18%). Acute cholecystitis is one of the most common causes of abdominal pain, and constitutes 30% of all emergency abdominal surgery in the elderly. In Holguin province, the geriatric patient is 15.2% of those who come to the emergency[7]

One of the elements that determine the increased risk in elderly surgical anesthetic, apart from one's biological age and physiological changes of aging are precisely associated diseases, which in emergency surgery, most of the time found unbalanced or unknown. Or associated comorbidities are the rule rather than the exception in the patient geriatric.[8,9] These diseases are numerous and frequent in this study were patients suffering from chronic disease, but this study of patients treated underwent elective surgery you were compensated at the time of the intervention.

Mindful of the high likelihood of complications due to biliary tract enfermedad elderly, while there are no medical contraindications, patients in this age group, who have gallstones, would benefit from early surgery scheduled. The elderly not only have more chances of complication of gallstone disease (acute cholecystitis, cholangitis and biliary pancreatitis), but are more likely to complications during surgery due to longer suffering from the acute vesicular disease crises YMAS, which makes the hardest dissections by fibrosis, inflammation and adhesions by chronic inflammation; so the age has been considered in most studies as a risk factor for the development of complications.[8–10]

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Clearly with age attends a deterioration of the internal functions, less responsive to stress, decreased sensitivity to pain and increased disease, which makes suspect that age and comorbidity are very close. As regards the respiratory system basically produces (among other changes as decreased lung capacity and tidal volume, increased respiratory rate, etc.) decreased muscle strength respiratory.[11] Morbid obesity, which at one time a relative contraindication to the laparoscopic approach was considered not accompanied by a higher rate of conversion. But in these patients physiologically increasing intrathoracic pressure occurs by compression of the abdomen supine displacing the diaphragm and lungs during ventilation decreasing induction anesthetic and pneumo insufflation, but also have a vital capacity and functional residual capacity diminished, if we add the increase in abdominal pressure capnoperitoneum, minute ventilation in this patient would then be much diminished with the probability of major respiratory complications occur especially before switching to the Trendelenburg position invested with it benefit these patients.[11]

The characteristics described above in obese patients, decreased venous return and therefore the preload which would contribute to a decrease in cardiac output and blood pressure probably; joined these patients behave as hypovolemic patients to have more free subcutaneous cellular tissue of a patient normal weight water.[11] Other authors report that obesity may induce greater willingness paralas atelectasis, hypoxemia and increased postoperative respiratory infections. Functionally this group of patients has decreased lung volumes with premature closure of the airways and decrease in blood pressure and blood oxygen alveolar oxygen difference.[12] On the other hand is well known that smoking, regardless of changes forced expiratory volume in one second (FEV1) it produces, increases the possibility of intraoperative and postoperative complications. However, the frequency decreases if they have quit smoking in the last 8 weeks.[11]

Atelectasis is a common finding after general anesthesia and their clinical relevance depends on the extent of lung collapse. Its incidence ranges between 2 and 10%. The immediate consequence is hypoxia, the intensity is correlated with the extent of atelectasis and that is secondary to shunt intrapulmonar originated in poorly ventilated areas but well perfused. The snuff affects their appearance, along with a number of concomitant diseases such as chronic obstructive (COPD), lung disease, pulmonary infection, neurological disease, poor cooperation capacity and low power muscular.[11]

Smoking predisposes to arterial vasoconstriction by the effect of nicotine and this can lead to poorly controlled hypertension, acute myocardial ischemia and predispose to arrhythmias. In the respiratory system produces airway hyper responsiveness to bronchoconstriction, mucus hyper production it is leading to mucosal edema and decreased gas exchange facilitating this sustained hypercapnia and hypoxia of these patients in the surgical procedure will increase pressure CO_2 insufflation this in the abdominal cavity, assuming that this gas is 20 times more diffusible the O_2 can be absorbed so that a significant amount over the power hypercapnia.[13,14] Durante anesthesia in laparoscopic surgery, produce a series of pathophysiological changes that they depend on CO_2 insufflation into the abdominal cavity, causing hemodynamic, respiratory, metabolic disorders and other systems, which must be taken into account for their management.[6,15]

Hemodynamic changes are determined by changes in position are subjected to patients, and by the mechanical effect exerted understanding of CO_2 into the peritoneal cavity. During induction of anesthesia, filling pressures of the left ventricle decreased, leading in turn to a decrease in heart rate, maintaining equal the mean arterial pressure. These changes are probably due to both the depressant action of inductors as the decrease in venous return to the position of the patient drugs.[6,15,16]

At the start of insufflation of the peritoneum with CO_2, it will produce an increase of both pulmonary and systemic blood pressure, which causes a decrease in cardiac index, maintaining equal the mean arterial pressure. The distension of the peritoneum causes the release of catecholamines, which trigger a vasoconstrictor response. There are elevated blood pressure during pneumoperitoneum filled, because the increased intra-abdominal pressure cause a redistribution of blood content of the abdominal viscera into the venous system, favouring increased filling pressures. It has also been observed a decrease in femoral venous flow when abdominal pressure increases by hyperinflation; as a result, there is decreased venous return and fall of cardiac preload (see Appendix 3, Figure 1). In short, there during the beginning of pneumoperitoneum increased resistance systemic and pulmonary vascular. Other studies have shown that, during insufflation of the pneumoperitoneum, there will be an increase in cardiac work and myocardial consumption oxygen.[6,15,11]

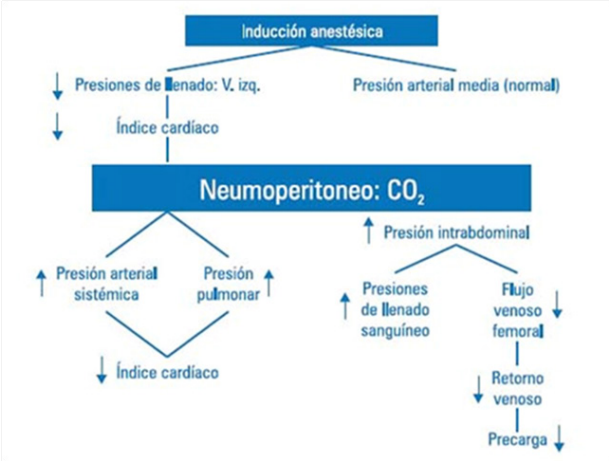

Figure 1 Hemodynamic Alterations during Anesthesia.

Therefore in patients with comorbidities including hypertension, ischemic heart disease and heart failure more hemodynamic alterations will occur more frequently and is therefore the cardio respiratory complications even though these have been offset included in the investigation. They are nevertheless insufficient studies that address these comorbidities as risk factors in the development of cardiac complications in anesthesia for laparoscopic cholecystectomy video. Cardiovascular diseases affect 20% of patients with advanced age and are responsible for 50% of mortality postoperative.[28] Ischemic heart disease increase morbidity and mortality in patients who will undergo non-cardiac surgery. 2% presented acute myocardial infarction during surgery, with a mortality of 25 to 70% in the immediate postoperative period, usually due to new attacks. In patients with coronary heart disease who have had a heart attack, the incidence of postoperative acute myocardial is 10 to 50 times higher than in those without such a history. The incidence is higher as more recent has been the attack. The recent unstable angina is an absolute contraindication for surgery not heart, as is accompanied by a 30% complication with high mortalidad.[11]

Heart failure, regardless of cause, is an important risk factor both during surgery and in the postoperative period. Mortality increases in relation to its intensity. Symptomatic stenotic lesions are associated with postoperative heart failure and usually require valve replacement. 25% of patients with symptomatic congestive heart

failure have acute pulmonary edema in the postoperative period, well above the 6% who do not have active signs of heart failure figure.[11] Not only hypertension is considered a risk factor, it can also present as one of the intraoperative complications, this occurs by hypercapnia secondary to blow CO_2 absorption of this gas in the peritoneal cavity. Increasing CO_2 stimulates the central nervous system that affects the myocardium directly or indirectly to the adrenal medulla, with release of catecholamines, which cause increased contractility, heart rate, peripheral vasoconstriction and hypertension beds. Inadequate anesthetic depth also produces hypertension. Handling is routed to increase ventilation to restore CO_2 figure to normal and lowering blood pressure alta.[6,16]

Hypertension is a risk factor that increases postoperative cardiac complications, primarily arrhythmias, myocardial infarction and failure cardiac.[17] However, currently no comprehensive series analyzing the possible importance of comorbidities of the patient in the development of cardiac complications in anesthesia for laparoscopic cholecystectomy video. In relation to respiratory disorders, CO_2 insufflation in the abdominal cavity and increased intra-abdominal pressure caused by the pneumoperitoneum, are factors particularly in lung function. It has been shown that during laparoscopy decreased lung compliance, respiratory volume reserve and functional residual capacity, with increasing inspiratory pressure peak occurs.[6,15,16]

Consequently, flow redistribution poorly perfused areas during mechanical ventilation with increased pulmonary dead space and shunt intra occurs. It has also been an increase in blood pressure gradient of CO_2, expired CO_2 pressure with decreasing pH, this condition can be corrected by increasing the minute volume between 15 and 20% and using positive pressure at end expiration of 5 cm H2O. There is also an increase in peak pressure and plateau pressure, which is then stabilized [6,15,16]. Regarding CO_2 absorption by the peritoneum, apparently this is stabilized after the first 10 minutes of increased intra-abdominal pressure. It is said that the pressure of the pneumoperitoneum on peritoneal capillary acts as a protective mechanism, preventing the absorption of CO_2 through it. At the end of the procedure, when intra-abdominal pressure decreases the output of CO_2, we will find increased CO_2 absorption rate, which can be registered by capnography (see Appendix 4) [6,15,16]

Regarding respiratory diseases; some authors suggest that decompensated chronic obstructive pulmonary disease is the most common respiratory process. Its prevalence is very high and is related to the consumption of snuff. The presence of chronic and poorly reversible airflow obstruction causes a decrease in FEV1 and its relationship with FVC. Bronchial hyperreactivity and retention of secretions, features in these patients, contribute to the development of intra- and postoperative respiratory disorders, mainly respiratory failure, pneumonia, atelectasis, empyema, edemas post pneumonectomy and bronchial fistulas pleural, a fact that increases the mortality rate post intervention. Also influences the occurrence of cardiac complications, primarily arrhythmias. Depending on its severity, chronic obstructive pulmonary disease is responsible for 25 to 75% of these complications and the cause of 25% of postoperative mortality in patients over 75 years.[11] Patients with a history of asthma may also have complications after surgery, mainly bronchospasm and respiratory failure.[11]

Respiratory infections are common in patients with bronchiectasis and obstructive processes. Streptococcous Pneumoniae infection, Haemophilus influenzae and Pseudomonas aeruginosa is common in exacerbations increased CO_2 absorption rate, which can be registered by capnography (see Appendix 4).[6,15,16]

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Respiratory infections are common in patients with bronchiectasis and obstructive processes. Streptococcous pneumoniae infection, Haemophilus influenzae and Pseudomonas aeruginosa is common in exacerbations of patients with Chronic Obstructive Pulmonary Disease.[11] The main preventive measure is proper preoperative treatment with bronchodilators, corticosteroids and even antibiotics, as the antibiogram, if they have respiratory infection companion. The elimination of smoking before surgery and performing preoperative chest physiotherapy help reduce postoperative complications and mortality.[11]

However, currently no comprehensive series analyzing the possible importance of comorbidities of the patient in the development of cardiac complications in anesthesia for laparoscopic cholecystectomy video. On the other hand the surgical anesthetic stress is a real aggression to the patient because the organism reproduces biochemical, functional and morphological changes that are expressed in a systematic general or particular.

International and national literature shows that, at present, video laparoscopic surgery has become the treatment of choice for symptomatic gallstones, for their indisputable advantages over conventional cholecystectomy. The benefits of laparoscopic surgery video on open cholecystectomy in acute cholecystitis are clear, and demonstrated in several studies.[1,2,12,18–20] However, there are still few international and national publications that assess the risk factors in the occurrence of cardiac complications in anesthesia for laparoscopic cholecystectomy video; with these results we can do, what appears to be the most rational approach, dealing with the greatest possible scientific rigor such risk factors in laparoscopic cholecystectomy video from appearing cardio respiratory complications.

Conclusion

The largest independent influence factor for the occurrence of cardiac complications in anesthesia for laparoscopic cholecystectomy video was hypertension, followed by obesity. Other factors hypothetically related to the risk of cardiac complications in anesthesia for laparoscopic cholecystectomy video, did not have an independent relationship.

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Conflicts of interest

Author declare that there is no conflict of interest.

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References

1. Torres Dugarte CG, Spinetti D. Colecistestomía laparoscópica versus colecistectomía abierta o tradicional. Resultados de una serie de 442 pacientes. MedULA, Revista de Facultad de Medicina, Mérida, Venezuela; 2002 pp. 11(1–4).
2. García Chávez Jesús, Ramírez Amezcua Francisco Javier. Colecistectomía de urgencia laparoscópica versus abierta. *Cir gen*. 2012;34(3):174–178.
3. Bonilla Parodi S. Anestesia general balanceada o endovenosa total para colecistectomialaparoscopica ambulatoria. 2013.
4. Pardo Gómez Gilberto. Actualidad de la cirugía de las vías biliares en Cuba. *Rev Cubana Cir.* 2012;51(3):209–210.
5. Zamora Santana Orlando, Rodríguez López–Calleja Carlos Arturo, et al. Logros y retos de la colecistectomía laparoscópica en Cuba. *Rev Cubana Cir*. 2015;50(4):509–516.
6. Enciso Nano J. Anestesia en Cirugía Laparoscópica abdominal. *Rev Horiz Med*. 2012;12(3).
7. Almaguer Orges Noel, Peña Pupo Nerza Enid, Rodríguez Pascual Yasmín, et al. Colecistectomía videolaparoscópica de urgencia en el paciente geriátrico. *Rev Cubana Cir*. 2015;50(4):517–524.
8. Reyes Martínez ML, García Lebón R, Rodríguez Tápanes V, et al. Cirugía laparoscópica en el paciente de la tercera edad. *Rev Cubana Med Milit.* 2011;35(2).
9. Del Campo Abad Roberto, Mederos Curbelo Orestes Noel, Da Costa Fernández José Manuel, et al. Colecistectomía con anestesia local como recurso en el paciente anciano. *Rev Cubana Cir*. 2015;50(1):96–101.
10. Almaguer Orges Noel, Peña Pupo Nerza Enid, Rodríguez Pascual Yasmín, et al. Colecistectomía videolaparoscópica de urgencia en el paciente geriátrico. *Rev Cubana Cir*. 2015;50(4):517–524.
11. JL Bravo Bravoa, F Heras Gómezb, F González Aragonesesc, JJ et al. Factores de riesgos. *Arch Bronconeumol*. 2004;40(Supl 5):38–44.
12. Rodríguez LS, Sánchez PCA, Acosta GLR, et al. Costes:colecistectomía laparoscópica frente a colecistectomía convencional. *Rev Cubana Cir.* 2011;45(3–4).
13. Chiapetta PL, Canullan C. Complicaciones de la colecistectomía laparoscópica. *Cirugía digestive*. 2009;4(453):1–5.
14. Olivé González JB. Complicaciones relacionadas con la anestesia, en cirugía laparoscópica. 2015.
15. Enciso NJ. Anestesia en la cirugía laparoscópica abdominal. *An Fac med*. 2013;74(1):63–70.
16. O'Malley C, Cunningham A. Cambios Fisiológicos durante la Laparoscopia. *Clínicas Anestesiológicas de Norteamérica*. 2011;1:1–18.
17. Torres PR, Barreras J, Ruíz TJ, Campillo DO, et al. Colecistectomía laparoscópica a través de un puerto único. *Rev Cubana Cir.* 2015;52(4):245–256.
18. Faife Faife BC, Barreras GJE, González LT, et al. Consideraciones generales sobre los procedimientos asociados en la cirugía laparoscópica. *Rev Cubana Cir*. 2015;51(2):201–208.
19. García–Ruiz Ay col. Colecistectomía laparoscópica más allá de la «curva de aprendizaj. *Asociación Mexicana de Cirugía Endoscópica, A.C*. 2010;11(2):63–70.
20. Martin DJ, Vernon DR, Toouli J. Tratamiento quirúrgico versus endoscópico de los cálculos de conductos biliares. *Cochrane Database of Systematic Reviews*. 2008.