



## Analysis of situations and post-surgical complications in cholecystectomy: an Ecuadorian society approach

Nivel de incertidumbre de los cuidadores frente al paciente pediátrico hospitalizado

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### Abstract

Cholecystectomy is a surgical intervention performed with the aim of removing the gallbladder, using different laparoscopic techniques, the intervention is performed with the application of a video camera and special materials without the need to open the patient's abdomen. To carry out a bibliographic review of the scientific literature on post-surgical complications in cholecystectomy in Ecuador. A documentary study of literature review was carried out using a qualitative approach, with a descriptive design through the analysis and compilation of relevant information from scientific and academic sources. For the search for information, we worked with the databases Scopus, Pubmed, Web of Science and the library of the Catholic University of Cuenca. Post-surgical complications of cholecystectomy are related to sociodemographic factors, i.e. intrinsic

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factors such as age, sex, comorbidities and others, and extrinsic factors related to the surgical process. The most frequent post-surgical complications in laparoscopic cholecystectomy are: nausea, vomiting, wound infection, jaundice preceded by pancreatitis, choledocholithiasis, while in open cholecystectomy they are: nausea and vomiting, lower abdominal pain, gastritis, jaundice, diarrhoea, irritable bowel syndrome.

**Key words:** Risk factors, postoperative complications, cholecystectomy, patient care

## Resumen

La colecistectomía es una intervención quirúrgica que se realiza con el objetivo de extirpar la vesícula biliar, para ello se utilizan diferentes técnicas laparoscópicas, la intervención se la realiza con la aplicación de una cámara de vídeo y materiales especiales sin tener la necesidad de abrir el abdomen del paciente. Efectuar una revisión bibliográfica de literatura científica sobre las complicaciones postquirúrgicas en colecistectomía en el Ecuador. Se realizó un estudio documental de revisión bibliográfica, misma que abordó un enfoque cualitativo, con un diseño descriptivo por medio del análisis y la recopilación de información relevante proveniente de fuentes científicas y académicas. Para la búsqueda de información, se trabajó con las bases de datos Scopus, Pubmed, Web of Science y la biblioteca de la Universidad Católica de Cuenca. Las complicaciones postquirúrgicas de la colecistectomía se relacionan con los factores sociodemográficos, es decir por factores intrínsecos como la edad, sexo, las comorbilidades y demás, y los factores extrínsecos relacionados al proceso quirúrgico. Las complicaciones postquirúrgicas más frecuentes en colecistectomía laparoscópica son; Náuseas, Vómito, Infección de herida, Ictericia precedida de pancreatitis, Coledocolitiasis, mientras que en colecistectomía abierta son: náuseas y vómitos, dolor abdominal inferior, gastritis, ictericia, diarrea, síndrome de intestino irritable.

**Palabras clave:** Factores de riesgo, complicaciones postquirúrgicas, colecistectomía, cuidado del paciente.

## Introduction

Cholecystectomy is a surgical intervention performed on the complications present in the gallbladder, despite the progress and technological innovation that has been developed year after year in favour of science and medicine; there are several cases of complications derived from said medical procedure, thus causing the need for priority attention. (Giraldo Molina, 2017) In addition, a number of situations have become evident that compromise the patient's health due to complications derived from cholecystectomy, those are associated with surgical lesions of the biliary tract, and may present infections in the wound, evidencing the suffering of choledocholithiasis, biloma, coleperitoneum, injury to major and minor vessels.

In this context, Alvarez and Vargas, in their study carried out in Spain, analysed the frequency of morbidity caused by postoperative complications in conventional cholecystectomy, and found the following: 4% to 12% together could show post-surgical haemorrhage and peritonitis (Alvarez Vargas, 2018).

While Perez (Perez Benitez , Post-operative complications in patients with conventional cholecystectomy and its impact on postoperative hospital stay in Hospital de la Amistad Peru Korea II - 2 Santa Rosa in Piura, 2017), in the city of Piura, in his study conducted taking as a sample 105 patients of the hospital of friendship of Peru Korea II2 Santa Rosa, showed that the average age at which postoperative complications predominated was 35 and 46 years, where the female gender predominated, resulting in this being an associated factor in complications of laparoscopic cholecystectomy together with the

diseases suffered by the patients or comorbidities and abdominal surgeries.

From this perspective, the study conducted by Barzola and Macias regarding nursing interventions in cholecystectomy-mediated postoperative complications at the General Hospital Dr. Liborio Panchana Sotomana Sotomán. Liborio Panchana Sotomayor, in Salinas Ecuador, (Barzola Suárez & Macías Panchana, 2018) determined that complications derived on a sample of 53 patients who underwent cholecystectomy: 50% presented pain, 17% vomiting, 17% loss of body temperature, 16% yellow skin and 13% changes in blood pressure.

In addition, it is important to point out that the complications mentioned may vary according to the patient's waiting time and the conditions in which the hospital unit is located, as it is certainly in this place where there is a greater probability of infection and, as a result, complications, 2020) showed in his study carried out at the Enrique Garcés hospital in Quito, Ecuador, that the length of stay in the hospital centre taken as the object of the study varied: 71% of patients were hospitalised for 3 days for immediate cholecystectomy, 45% stayed 4 days for early cholecystectomy and lastly, 53% of patients were hospitalised for late cholecystectomy for 7 to 10 days.

In the opinion of Aguirre and Adriana, in their thesis carried out at the University of Guayaquil, they carried out an investigation at the University Hospital, with the aim of revealing the rate of postoperative complications in cholecystectomy, 23% of the patients presented postoperative complications of conventional or laparoscopic cholecystectomy of the total population that was the object of the study, likewise, it was identified that the most frequent associated factor in these complications is gender, followed by age and medical history (Maurath Aguirre, 2019).

Therefore, the development of this research is justified due to the high incidence and prevalence of post-surgical complications, which drives the need to address this issue, as it is necessary to demonstrate the methods by which doctors perform the practice of such surgery, emphasizing that there are invasive, simple and practical methods for performing cholecystectomy, and despite this: in our country, open cholecystectomy is still considered to be the most viable, due to various factors: lack of training of doctors in laparoscopic training, lack of the necessary medical technology equipment, lack of personnel, etc.

At the same time, a significant social relevance is covered, as the study focuses on the analysis of the most relevant information approached from the perspective of different authors, where the most significant results show the causes and consequences of post-surgical complications, benefiting the population that requires it, and of course the general public as it shows the importance of strict post-operative care, methods of prevention of complications and proper patient care. In this sense, the aim of this article is to carry out a bibliographic review of the scientific literature on postoperative complications in cholecystectomy in Ecuador.

Post-surgical complications are medical disorders that occur infrequently after interventions; however, the highest incidence is certainly related to several factors, whether clinical, social, demographic, etc. Thus, Martos Benítez et al. (Martos Benítez, 2017) allude that postoperative complications are difficulties that should be taken into consideration as a priority in patient care and risk prevention policies in hospital centres, with patient health and stability as a priority, and, in the case of requiring the implementation of structural changes to mitigate postoperative morbidity and mortality, to implement them urgently.

Post-surgical complications of cholecystectomy are related to clinical sociodemographic factors of each patient, i.e. intrinsic factors such as age, sex, comorbidities and extrinsic factors which are those related to the surgical process (Bellido Huertas J. 2017).

Gender. With regard to male or female sex, it cannot be inferred that one of them is the main one in relation to post-surgical complications in cholecystectomy, so there is no explanatory association between a certain gender and the complications that derive from it. (Aguilar Bazurto, 2017).

However, the female sex is more prone to suffer from biliary pathologies such as lithiasis, which results in a higher frequency of the female gender in cholecystectomy, and consequently, this will be more common in the rate of postoperative complications of cholecystectomy, so Brañez, (Brañez Baltazar, 2019) alludes that according to this fact it is usually deduced that the female gender is a factor that is associated with being more likely to have complications in cholecystectomy. However, the male gender also tends to predominate in this type of surgery and these complications, which varies the frequency of complications by gender. (Perez Benitez, Post-operative complications in patients with conventional cholecystectomy and its impact on postoperative hospital stay in the hospital of friendship Peru Korea II-2 Sta Rosa, 2017).

Age. According to Racines Narváez et al. (Racines Narváez & Reyes Moscoso, 2019) a risk factor identified in postoperative complications in cholecystectomy is advanced age, precisely in adults over 65 years of age, who develop greater difficulty in their postoperative recovery and, in turn, is accompanied by other associated pathological diseases that probably tend to increase the risk of mortality and complications in cholecystectomy.

Comorbidities and pathological history. Comorbidities are the patient's own diseases, such as obesity, diabetes mellitus, cancer, liver cirrhosis, chronic renal failure (CKD), which, although some of these pathologies do not have such a detrimental effect, can affect the length of stay in the hospital and affect the postoperative course; these comorbidities become a factor in postoperative complications.

According to Fauci et al. (Fauci, et al., 2017) Diabetes Mellitus is a factor that interferes with the wound healing processes of cholecystectomy surgery, as well as Hypertension is another clinical factor associated with complications, as it increases anaesthetic risk and contributes to bleeding.

Surgical complexity. Surgical complexity is related to postoperative complications, whether for laparoscopic or open cholecystectomy surgery, since any error by the medical team can have negative effects on the patient's recovery. (Collantes Goicochea, 2018).

Clinical factors. In the same way, and as previously stated about socio-demographic factors, Bellido, (Bellido Huertas J. M., 2018) briefly explains the clinical factors that are associated with post-surgical complications in cholecystectomy: type of surgery, fever, jaundice, choloria, ASA.

Lifestyle. The patient tends to present post-surgical complications if he/she maintains a fast-paced and careless lifestyle, including activities that involve lifting heavy items, neglect of nutritious food intake, frequent consumption of fatty foods, and the use of harmful substances, alcohol, tobacco, drugs (Permanent Medicine, 2020).

Cultural factors influencing patients in the management of post-surgical complications

According to Garcia, (Garcia, 2019) traditional medicine has become very common worldwide among different social groups, as it maintains an effectiveness to heal various diseases from simple colds to much more complex ailments, such as epilepsy, Parkinson's, among others; therefore, countless people opt for this type of medicine, because health experts have begun to value its benefits.

Then, because of the effectiveness that natural medicine has proven to have in efficiently alleviating discomforts such as pain and nausea, which are frequent in the post-surgical complications of cholecystectomy, many patients choose to resort to this type of medicinal alternative, due to the customs or beliefs held by various rural groups. (Nazar, Bastidas, Fuentes, Zamora, & Coloma, 2017).

Most frequent postoperative complications in laparoscopic and open cholecystectomy in Ecuador.

According to Lascano Gallegos et al. (Lascano Gallegos, Comas Roríguez, & Murriagui Barrera, 2018), the most frequent post-surgical complications in laparoscopic cholecystectomy identified in hospitals and health centres in Ecuador are nausea, vomiting, surgical wound infection, jaundice preceded by pancreatitis, and choledocholithiasis. A patient who has undergone a laparoscopic operation has various complications ranging from mild to severe, Domínguez (Domínguez Membreño, 2017) that may even require a liver transplant due to the possible complications arising from such an intervention.

The symptoms after cholecystectomy surgery or postoperative complications of open cholecystectomy will depend to some extent on the case of each patient, however, according to Salazar et al. (Salazar Morales & Romero Santana, 2019) the most frequent postoperative complications observed in hospitals in Ecuador are nausea and vomiting, lower abdominal pain, gastritis, jaundice, diarrhoea, irritable bowel syndrome, gastrointestinal reflux disease,



gastroesophageal reflux disease, gastrointestinal reflux disease and gastrointestinal reflux disease. Gastroesophageal reflux disease. In addition to the above, Encalada et al. (Encalada Calero, Jaramillo Martínez, Ramírez García, & López Chinga, 2017) mention that it is also possible to generate conditions that require further surgery leading to cirrhosis or, in the worst case, death.

Cholecystectomy is one of the most common surgical procedures in the general population, being used to solve diseases of the biliary tract, which is currently a problem of great morbidity worldwide, and is one of the most frequent reasons why people go to the emergency section of a hospital centre. According to Gonzaga, (Gonzaga Peña, 2017) the prevalence of cholecystectomy at a global level in adults varies between 5.9% and 21.9%, with variability by geographical and regional locations; on the other hand, the mortality rate is accentuated in older people. In Ecuador, at least 75% of gallstones are caused by cholesterol.

The epidemiological characteristics of the disease are that it is more prevalent in women than in men. The frequency of the disease increases with age, the older the age, the higher the risk of gallbladder and biliary diseases. Obese people have an increased risk of gallbladder disease, as being overweight increases biliary cholesterol secretion. The authors Ulloa and Vega reveal that the most frequent age of patients who come to the centre with this disease is between 40 and 60 years old, prior to which a diagnosis is made to determine whether the degree is mild or malignant (Ulloa & Henry, 2019).

In summary, the epidemiological factors that can generate the development of gallbladder disease and post-surgical complications after cholecystectomy are basically age, sex, Body Mass Index (BMI) and additional comorbidities (Quiroga Meriño, Estrada Brizuela, Hernández Agüero, Fuentes Ferrales, & Consuegra Román, 2020).

### Nursing care in patients with complications following cholecystectomy surgery

The nursing care provided to patients with post-surgical complications in cholecystectomy is based on the aim of repairing possible damage generated after surgery, whether due to poor hygiene, inadequate nutrition, etc. (Mastache Martinez, 2018). Surgical wound care will be one of the recommendations to be emphasised, as surgical site infection (SSI) is currently one of the most frequent causes of complications in the post-operative period and accounts for 38% of all infections associated with health care (Ximena Torres, 2022). (Ximena Torres, 2022)

The care provided is: Monitoring of vital signs. Administer pain and infection control medication as prescribed by the physician. Healing and cleaning of the surgical wound. Monitoring for possible wound drainage. Signs of infection, onset of fever or hyperthermia, swollen edges, oozing or foul odour. Control of water and electrolyte balance (Rodriguez Velasco, 2018).

Including assessment of gastrointestinal function, through auscultation of hydro-aerial bowel sounds. Urinary elimination to check renal function. Soft diet. Explain to the patient that moderate physical activity should be carried out progressively, such as starting with gentle steps for short distances without great intensity and gradually returning to the activity they had before. (GUTIERREZ, 2022).

## Methodology

A documentary study of bibliographic review was carried out, using a qualitative approach, with a descriptive design through the analysis and compilation of relevant information from scientific and academic sources. For the search of information, we worked with the databases

Scopus, Pubmed, Web of Science and the library of the Catholic University of Cuenca. Together with the combination of keywords and Boolean operators AND, OR and the use of Descriptors in Health Sciences DeCS.

Studies were selected that were related to post-surgical complications in cholecystectomy in Ecuador, with respect to the inclusion criteria, articles in English and Spanish published within the last 5 years were chosen. Studies that were not related to the research, publications less than 5 years old and that did not belong to the English and Spanish language were excluded.

With regard to the above, it should be emphasised that with the application of the descriptive-argumentative methodology, priority was given to locating secondary sources with the most outstanding findings on the theory and statistical data addressed by different authors, arguing the most relevant information, perfecting the research through the appropriate analysis of the information presented, allowing the socio-demographic factors of post-surgical complications in cholecystectomy to be shown, adding support for their own opinions, based on the idea of the authors.

## Results

The epidemiological characteristics of cholecystectomy are varied, as with respect to clinical socio-demographic factors and lifestyle associated with post-surgical complications in cholecystectomy, it is highlighted that the prevalence and frequency of gallstone disease increases with age, lifestyle, and even gender. The most relevant results show that people with a high rate of obesity predispose to a higher risk of gallbladder disease, as shown in the study conducted by Navas et al. (Navas Montero, Martínez Martínez, & Palomino Hurtado, 2016) in 2022 regarding the relationship between overweight and obesity and the evolution of patients undergoing cholecystectomy surgery at the Hospital Sagrado Corazón de Jesús

Quevedo concluded that: out of a sample of 33 patients admitted to the hospital for gallbladder disease, they were diagnosed with grade I obesity and overweight; however, post-surgical complications were minimal.

Similar information is reported by Lasnibat et al. (Lasnibat R, et al., 2017) in their study on cholelithiasis in obese patients undergoing bariatric surgery: 12-month postoperative study and follow-up, it is evident that several patients (52.8%) who have suffered from obesity and therefore underwent bypass surgery, potentially increase the risk of forming solid residues in the gallbladder called cholelithiasis, and within 12 months the need for cholecystectomy intervention arises.

It should also be noted that age is a determining socio-demographic factor for the occurrence of post-surgical complications in cholecystectomy, since the older the individual is, the greater the probability of being operated on for this type of operation, or for complications that arise after the surgical process. Diaz et al. (Diaz Calderin, Fuentes Valdes, Vilorio Haza, Silvera Garcia, & Perez Gonzalez, 2018) in their study determined that of 3,900 patients over 70 years of age who underwent laparoscopic cholecystectomy, 83.9% of them were between 70 and 79 years of age, so the older the patient, the greater the risk of being operated on by cholecystectomy, based on the opinions of various authors, laparoscopic surgery is the safest for this group of patients.

When a cholecystectomy is performed, there is a high probability of suffering various complications that are associated with intrinsic and extrinsic factors. Intrinsic factors include age, comorbidities and gender; the latter continues to be the subject of debate in many investigations since, on the one hand, it is evident that the female gender has a higher probability of suffering from lithiasis and therefore the development of complications from cholecystectomy, however, it is also determined that the male gender is prone to undergo these surgeries. A clear example of this is provided by Morales et al. (Zambrano Morales, Ponce Moreno, & Casanova Castillo, 2018) in a sample of 23 patients who underwent cholecystectomy, 78.26% were female and 21.74% were male.

With regard to extrinsic factors, these are complexities originating in the operating theatre, clinical pictures of the patient such as symptoms of fever, choluria and jaundice and, finally, lifestyle is one of the most important factors related to the complications of this medical intervention, as it was identified that as long as patients have a healthy lifestyle both in terms of diet and physical activity, the level of risk will decrease.

According to national studies, in hospitals in Ecuador, the frequent complications that occur after laparoscopic cholecystectomy are: nausea, vomiting, incisional and bile infections. In addition, Chama et al. (Chama Naranjo, Farell R, & Cuevas O, 2021), in their study carried out to demonstrate safe cholecystectomy, state that another frequent complication is gallbladder lesions, with an incidence of 0.2% to 0.4%. Similarly, open cholecystectomy is associated with abdominal pain at the incision site, gastritis, jaundice, irritable bowel and gastric reflux.

Currently, cholecystectomy surgery is one of the most common procedures in health systems. In Ecuador, the reality is the same as in other countries, as it is the most common procedure used to treat pathologies such as cholelithiasis and cholecystitis, which are the diseases that are most frequently seen in health care centres, As has been determined, there are two characteristic interventions of this operation, which is laparoscopic and open surgery, both types of procedures generate postoperative complications if the patient has a medical history that slightly or moderately compromises the recovery process.

According to the results, the importance of the laparoscopic cholecystectomy procedure is highlighted, as the results of several authors show that this procedure is safer, generates fewer complications, and has a faster recovery process, as well as being less invasive for the patient. It is important to highlight that each procedure has its advantages and disadvantages, always depending on the patient's medical history, and the different factors that intervene before, during and after surgery.

In the study by Zambrano et al. regarding the experience in laparoscopic cholecystectomy at the Hospital Dr. Verdi Cevallos Balda, the patient's medical history and the different factors that

intervene before, during and after the surgery. Verdi Cevallos Balda Hospital, Ecuador, it is stated that cholecystectomy complications will vary according to the type of operation performed. In our country, the most recurrent cholecystectomy surgery is laparoscopic cholecystectomy, as evidenced in the results of the research where several authors affirm this according to the data obtained in their studies, as the process represents a rate of 5.6% of postoperative complications and also the hospitalisation of the patient is one or two days, which is consistent with the research of Buri et al. (Buri Parra , Ulloa Gómez, Vega Cuadrado, & Encalada Torres, 2018) as the average patient stay surrounds 2 days and also complications are minimal, in 94.4% of clinical cases they did not indicate complications.

Several studies show that the female gender tends to suffer greater complications from cholecystectomy, with respect to the male gender, and in this section the hypothesis is reaffirmed, as one of the most relevant results details the following, In the Military Hospital of Cuenca, Ecuador during the time of research on 822 patients treated for cholecystectomy between January 1996 to December 2015, (Buri Parra, Ulloa Gómez, Vega Cuadrado, & Encalada Torres, 2018) shows that the female gender prevailed with 61.8% over the male gender, emphasising that those patients aged between 40 and 60 years remained in hospital for an even longer period of time.

## Conclusions

Among the main postoperative complications of laparoscopic cholecystectomies, haemorrhages are the most common, followed by nausea and vomiting, and in third place jaundice and omoalgia: the female gender predominates in the suffering of postoperative complications, while, with respect to age, adults and older adults have a higher frequency of suffering from them.

In Ecuador, laparoscopic cholecystectomy, despite being the most recommended, is undoubtedly a major challenge for medical personnel, due to the lack of knowledge and training, as well as the scarce material and technological resources in the public health system, which complement the necessary requirements for success and the reduction of postoperative risks.

In general, the main risk factors for the development of postoperative complications are: the type of surgery, the patient's age, the patient's nutritional status, and the patient's comorbidities, all of which form an equation that leads to the generation of complications associated with cholecystectomy surgical procedures. In addition to the above, it should be noted that the laparoscopic cholecystectomy procedure is much more common in adults because, in most patients, the results are effective and have a low rate of complications, in addition to the fact that the technique is less invasive.

The various complications that can arise from the different procedures, it is extremely important that the medical and nursing staff are highly trained to prevent unfavourable situations and maintain adequate care for patients in all the guidelines required, control of signs, healing, administration of medicines, and the preparation of clinical histories for the analysis and study of the comorbidities of each patient.

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