# Randomized study for assessment of hypolipidic diet in digestive symptoms immediately following laparoscopic cholecystectomy

## *Estudo randomizado para avaliação da dieta hipolipídica nos sintomas digestivos no pós-operatório imediato da colecistectomia por videolaparoscopia*

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## ABSTRACT

**Objective**: To validate the need for prescribing low-fat diet in the prevention or reduction of dyspeptic symptoms in the postoperative period in patients undergoing laparoscopic cholecystectomy. **Methods**: We selected 40 patients, free of liver or pancreatic disease, biliary gallstones, gastritis, ulcer, diabetes and dyslipidemia, who were divided into two groups. We conducted dietary anamnesis, identification of dyspepsia before the onset of cholelithiasis and guidance on appropriate postoperatively feeding (normal or low-fat). We used the chi-square test and Pearson correlation for statistical assessment, considering p d" 0.05 as significant. **Results**: When comparing the two groups of patients without preoperative dyspepsia, it was observed that in group I seven patients (63.6%) were asymptomatic and in group II, four (66.7%). In group I, four (36.4%) had onset of symptoms and in group II, two (33.3%), p = 0.684. When correlating the two groups with preoperative dyspeptic symptoms, it was observed that there was permanence, appearance or disappearance of symptoms postoperatively, p = 0.114. **Conclusion**: There was no significant effect of low-fat diet in the prevention of gastrointestinal symptoms, especially in preoperatively asymptomatic patients. Thus, there is no need of a low-fat diet. So, it is up to the surgeon to evaluate each patient individually and adjust the diet to his/her needs and clinical conditions.

**Key words:** Cholecystectomy. Dyspepsia. Signs and symptoms, digestive. Dietary fats. Nutrition therapy.

## INTRODUCTION

Laparoscopic cholecystectomy is the method of choice in the treatment of cholelithiasis [1,2]. The goal of surgery is to relieve symptoms and to treat and/or prevent complications [1,3,4]. However, in about 10% to 50% of patients undergoing cholecystectomy, symptoms persist or new ones develop [1,3]. The persistence or onset of symptoms after surgery is called post-cholecystectomy syndrome [2]. These symptoms are usually mild and nonspecific, comprising flatulence, nausea, belching and indigestion [1,3].

The most common cause of post-cholecystectomy syndrome are the extra-biliary disorders such as peptic ulcer disease, gastroesophageal reflux disease and irritable bowel syndrome. Only in a minority of cases the symptoms are due to biliary tract disease [1,3].

At present, there is no valid reason to restrict the diet of a patient undergoing cholecystectomy in the postoperative period, since the gallbladder is not an organ of bile production, but of storage[5]. However, many consider a measure of caution to limit the consumption of lipids in the first weeks after surgery, believing that this would reduce the chance of developing symptoms typical of post-cholecystectomy syndrome[5]. This creates a controversy among surgeons regarding the postoperative indication or not of a low-fat diet in these patients. To date, there are no scientific studies that show sufficient efficacy or not of prescribing low-fat diet after cholecystectomy.

In order to identify and target the best food planning of patients, this study sought to assess the need for prescription of diet this type of diet in the prevention or reduction of gastrointestinal symptoms during the

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postoperative period in patients undergoing laparoscopic cholecystectomy.

## METHODS

We conducted a randomized clinical trial in which we selected 97 patients with cholelithiasis who were to undergo laparoscopic cholecystectomy, treated at the clinics of General Surgery, Gastroenterology and Emergency Room of the Arthur Ramos Memorial Hospital, in Maceió – AL. The diagnosis was made after clinical, laboratory and imaging exams.

The study included patients of both sexes with symptoms of gallstones, who did not display hepato-pancreatic associated diseases preoperatively, after being subjected to the following tests: total ultrasound of the abdomen; endoscopy; biochemical analysis (AST, ALT, gamma-GT, alkaline phosphatase, bilirubins, pancreatic amylase, pancreatic lipase, glucose, total cholesterol, LDL and HDL-cholesterol and triglycerides).

We excluded patients with gastritis, gastric or duodenal ulcer, liver disease, pancreatic disease, biliary lithiasis, diabetes and dyslipidemia.

Patients were evaluated using forms containing the results of preoperative tests in order to rule out liver diseases, pancreatic diseases, gastritis, ulcers and biliary lithiasis, which, associated with cholelithiasis, could confound the evaluation of postoperative symptoms, not inherent to the study in progress.

We selected 40 patients, corresponding to 41.2% of the sample surveyed. Block randomization was performed using a random number table, generating two groups of 20 patients: Group I would follow a low-fat diet postoperatively, and group II, a normal diet. We conducted a succinct history in both groups directed to the intake of foods rich in lipids, aiming at a better orientation in the postoperative period and, at the same time, not stimulating the introduction of this type of food people of group II who had this previous habit, since symptoms could arise postoperatively in patients who have some kind of intolerance or dyspepsia before the onset of cholelithiasis.

Thus, after the dietary assessment, we established the recommended diet after cholecystectomy. We assessed and tabulated symptoms preoperatively and postoperatively, to facilitate construction of the work analysis and its results.

At the time of hospitalization, patients received a form containing the dietary plan to be followed postoperatively and they were instructed to return in 15 days for data collection.

In the statistical analysis, we used the chi-square test and Pearson correlation test, considering p £ 0.05 as significant.

This study was approved by the Ethics Committee in Research of Arthur Ramos Memorial Hospital, in the opinion 001/2011 of 02/06/2011.

## RESULTS

Among the 40 patients undergoing cholecystectomy who matched the inclusion criteria, there were 32 females (80%) and eight males (20%). The age ranged between 18 and 76 years, mean 47.

N In the preoperative period of the two groups studied, we observed that 17 (42.5%) were asymptomatic and 23 (57.5%) symptomatic.

Among the symptomatic patients, the most prevalent preoperative symptoms were constipation and flatulence. These appeared alone, together or with other symptoms (Figure 1).

After the division of the groups, we observed that in the group that received low-fat diet 11 (55%) patients were asymptomatic and nine (45%) were symptomatic preoperatively.

Postoperatively, seven (35%) of the asymptomatic patients remained like so, four (20%) started having symptoms. Of the symptomatic patients, two (10%) became asymptomatic and seven (35%) remained symptomatic.

In the group that received normal diet, six (30%) were asymptomatic and 14 (70%) symptomatic preoperatively.

Postoperatively, four (20%) asymptomatic patients remained asymptomatic, two (10%) started having symptoms. As for the symptomatic ones, three (15%) became asymptomatic and 11 (55%) remained symptomatic.

Considering the asymptomatic patients preoperatively in both groups, we found that: in group I

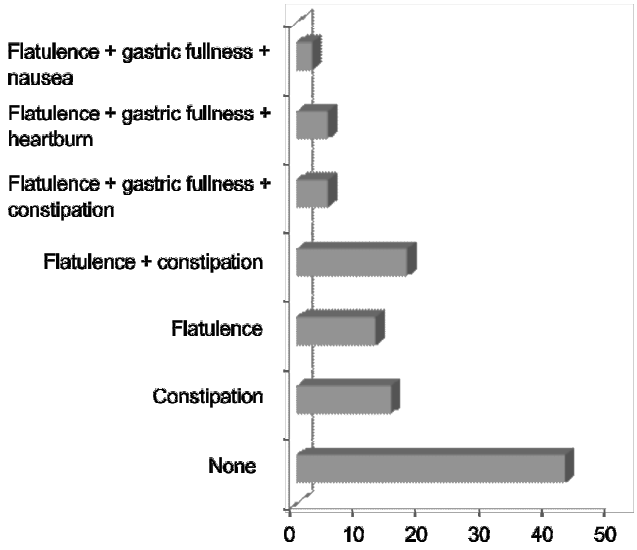


***Figure 1*** - *Preoperative symptoms of both groups.*

(low-fat diet), of the 11 patients, seven (63.6%) had no digestive symptoms postoperatively, only four (36, 4%) displaying symptoms. In group II (normal diet), of the six patients, four (66.7%) had no digestive symptoms postoperatively and in two (33.3%) there was onset of symptoms (Table 1):

Statistical analysis showed no significant difference between preoperative asymptomatic patients who followed the low-fat diet and the normal diet in the prevention or reduction of dyspeptic symptoms during the postoperative period of 15 days ( $p > 0.05$ – chi-square test).

Considering symptomatic patients preoperatively in both groups, we observed that of the nine patients in group I, in two (22.2%) there was the disappearance of gastrointestinal symptoms postoperatively, six (66.7%) remained with the same symptoms and one (11.1%) there was an exchange of symptoms, ie, one disappeared, but a different one came up.

In group II, of 14 patients three (21.4%) showed disappearance of gastrointestinal symptoms postoperatively, in two (14.3%) there was exchange of symptoms, two (14.3%) remained with the same symptoms, in one (7.1%) another symptom was added, in other four (28.6%) some remained and others disappear, and in two (14.3%) some remained and there was symptom exchange (Table 2).

Statistical analysis showed no significant difference between the preoperatively symptomatic patients who followed the low-fat diet and the normal diet in the prevention or reduction of digestive symptoms during the postoperative period of 15 days ($p > 0.05$, chi-square test).

## DISCUSSION

In our sample, cholelithiasis was four times more common in females, which is consistent with the literature, which refers to a frequency of three to four times higher in females [2,4,6-9]. The hormonal influences seem to be the responsible factors, such as contraceptive use in fertile women and postmenopausal estrogen, which increases the lithogenic potential of bile, besides the psychological vulnerability [7,9]. The average age also corresponds to the average found in the literature [4,7,9].

The majority of cholecystectomy patients had varied postoperative symptoms [1,10]. In the study we found constipation, flatulence, nausea and gastric fullness, which is in agreement with the literature [7-9,11]. A common symptom reported in the literature, though not found in this study, was the intolerance for fatty foods intake [7,8].

As noted, preoperatively in both groups the predominant symptoms were flatulence and constipation and both remained postoperatively in most patients. The literature also points these symptoms as with no significant improvement after cholecystectomy [7,8].

In both groups, regardless of the diet recommended, more than half of asymptomatic patients remained asymptomatic postoperatively, 63.63% in those who followed the low-fat diet and 66.66% in those who followed the normal diet, indicating a negligible difference.

**Table 1** - Comparison of postoperative symptoms between the two groups of preoperatively asymptomatic patients.

| Symptoms | Low-fat | | Normal | |
|---|---|---|---|---|
| | (n) | (%) | (n) | (%) |
| Remained asymptomatic | 7 | 63.6 | 4 | 66.7 |
| Appearance of symptoms | 4 | 36.4 | 2 | 33.3 |
| Total | 11 | 100.0 | 6 | 100.0 |

*Pearson qui-square Test with Yates correction of continuity, p = 0.6847*

**Table 2** - Comparison of postoperative symptoms between the two groups of preoperatively symptomatic patients.

| Symptoms | Low-fat | | Normal | |
|---|---|---|---|---|
| | (n) | (%) | (n) | (%) |
| Disappearance | 2 | 22.2 | 3 | 21.4 |
| Exchange of symptoms | - | - | 2 | 14.3 |
| Permanence of the symptoms | 6 | 66.7 | 2 | 14.3 |
| Permanence and addition of other symptoms | - | - | 1 | 7.1 |
| Permanence of some and disappearance of others | - | - | 4 | 28.6 |
| Permanence and exchange of symptoms | 1 | 11.1 | 2 | 14.3 |
| Total | 9 | 100.0 | 14 | 100.0 |

*Pearson qui-square Test with Yates correction of continuity, p = 0.1146*

As for the rest of preoperatively asymptomatic patients, there was the appearance of symptoms in 36.36% of those with low-fat diet and in 33.32% with normal diet, also not significant.

Considering symptomatic patients preoperatively in both groups, there was disappearance, appearance or persistence of symptoms postoperatively.

The use of low-fat diet after cholecystectomy is controversial in the literature and among surgeons, because despite no significant improvement of symptoms having been documented with this diet, many doctors prescribe it and, when they do not, many patients continue with it after surgery for fear, since high-fat foods are related intolerance and the appearance of symptoms in the preoperative period [5,7].

In both groups there was disappearance of dyspeptic symptoms such as fullness, nausea and heartburn, but there was persistence of colonic symptoms such as bloating and constipation. This variability of symptoms present in the postoperative period is also controversial in the literature, as a part of the authors says that the symptoms that most persist after the operation are dyspeptic, but persistence of colonic symptoms and disappearance of dyspeptic ones have also been found [7,11].

Patients who already had preoperative dyspepsia, which appeared not to be correlated with cholelithiasis, nor with cholecystectomy, remained with the same symptoms after the operation, the persistence of symptoms being possibly linked to psychological vulnerability, as pointed by the literature [4,7,11-13].

Several factors are involved in the pathophysiology and pathogenesis of post-cholecystectomy syndrome [12]. Some of these symptoms may be caused by organic disorders, such as the formation of gallstones in the common bile duct after surgery, peptic ulcer and so forth. However, the exact origin of the symptoms is not clear [12].

It is believed that some symptoms may be caused by other diseases of the digestive tract, which, after the diagnosis of gallstones, have been mistakenly associated with lithiasis. Other symptoms may be caused by disorders directly related to cholecystectomy, such as biliary stenosis, retained calculi, stenosis or dyskinesia of the sphincter of Oddi, diarrhea induced by bile salts and long remnant cystic duct [3,5,10,13, 14]. On the other hand, opioids and other drugs used in high doses in general anesthesia, such as alfentanil and fentanyl citrate and morphine derivatives, have side effects such as nausea and vomiting, and reduce gastrointestinal motility, causing constipation [1,6].

It was found that the persistence of symptoms has multiple causes, and 50% of patients have some kind of pancreaticobiliary organic disorder or in the gastrointestinal system. To the remaining patients, psychosomatic causes can be attributed [13].

The etiology of sustained symptoms after cholecystectomy is multifactorial, being subject to future studies that should be directed to the physiological changes that occur after the procedure, aiming, beyond prevention, better selection of patients for elective cholecystectomy [12].

The results obtained in this study show that there was no significant effect of low-fat diet in the prevention or reduction of dyspeptic symptoms in the immediate postoperative period of laparoscopic cholecystectomy, especially those preoperatively asymptomatic. Thus, the prescription of a diet low in fat depends on the line that the surgeon prefers to follow and the patient's profile and its associated clinical conditions, as some prefer to keep the preoperative low-fat diet after cholecystectomy due to psychological factors.

We therefore recommend that the surgeon assess each patient individually and adjust the diet to her/his needs and associated clinical conditions. On some occasions it is necessary that the patient be referred to the Department of Nutrition.

## RESUMO

***Objetivo:*** *Validar a necessidade da prescrição da dieta hipolipídica na prevenção ou redução dos sintomas dispépticos no período pós-operatório de pacientes submetidos à colecistectomia por videolaparoscopia.* ***Métodos:*** *Foram selecionados 40 pacientes, distribuídos em dois grupos, isentos de doenças hepáticas, pancreáticas, litíase da via biliar, gastrite, úlcera, diabetes e dislipidemia. Foi realizado anamnese alimentar, identificação de dispepsias antes do aparecimento da colelitíase e orientações sobre a conduta alimentar no pós-operatório (normal ou hipolipídica). Foi utilizado o teste* chi-square *e a correlação de Pearson, considerando pd"0,05 como significância estatística.* ***Resultados:*** *Comparando-se os dois grupos de pacientes sem dispepsias no pré-operatório, observou-se que no grupo I, sete pacientes (63,6%) permaneceram assintomáticos e no grupo II, quatro (66,7%). No grupo I, em quatro (36,4%) houve aparecimento de sintomas e no grupo II, em dois (33,3%), logo p=0,684. Correlacionando-se os dois grupos dispépticos no pré-operatório, observou-se que houve permanência, aparecimento ou desaparecimento dos sintomas no pós-operatório, sendo p=0,114.* ***Conclusão:*** *Não houve repercussão significativa da dieta hipolipídica na prevenção dos sintomas dispépticos, principalmente nos pacientes assintomáticos no pré-operatório. Sendo assim, não há necessidade em se orientar uma dieta hipolipídica. De modo que, cabe ao cirurgião avaliar cada paciente individualmente e ajustar a dieta às necessidades do paciente e às condições clínicas associadas.*

***Descritores:*** *Colecistectomia. Dispepsia. Sinais e sintomas disgetórios. Gorduras na dieta. Terapia Nutricional.*

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