

Home hospitalization for the surgical and conservative treatment of acute calculous cholecystitis

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Aim: Acute calculous cholecystitis is a frequent complication of gallstones that can manifest in up to 10–15 per cent of previously asymptomatic patients. Current guidelines recommend laparoscopic cholecystectomy as the gold standard treatment; however, the presence of surgery risk factors might compel physicians to opt for conservative treatment, which is often associated with longer hospital stay. Home hospitalization could be an alternative to inpatient stay for these patients.

Patients and Methods: The present study was a retrospective analysis of data from a prospective patient single-centre registry. Data from 915 patients with mild or moderate acute calculous cholecystitis, who presented in the Department of General Surgery of our hospital between 2010 and 2015, were analysed. The variables included grade of acute cholecystitis, type of treatment, use of antibiotics, inpatient stay, stay in hospital-at-home, complications, mortality, readmissions and relapse.

Results: A total of 147 (16 per cent) patients were referred to hospital-at-home, while the rest completed their treatment in the hospital ward. There were no significant differences between the home hospitalization and conventional hospitalization groups in the rates of complications, mortality, readmissions, relapse and length of antibiotherapy. Home hospitalization was associated with shorter inpatient stay, but longer total hospitalization, likely due to a prolonged follow up by the home care unit.

Conclusions: Home hospitalization is an effective and safe alternative to conventional hospitalization, as it provides hospital-level care and reduces the number of admissions and length of inpatient stay. The timely referral of patients to other levels of assistance, such as primary care, is needed to ensure economic benefits of home hospitalization programmes.

Key words: acute cholecystitis, ertapenem, home hospitalization, laparoscopic cholecystectomy, Tokyo Guidelines

Introduction

Acute cholecystitis is an acute inflammation of the gallbladder, which, in 90 per cent of cases, is caused by cholelithiasis or gallstones.¹ Acute calculous cholecystitis is one of the most common complications of cholelithiasis; up to 20–40 per cent of asymptomatic patients with gallstones will eventually develop symptoms, and in up to 10–15 per cent of patients, acute cholecystitis will be the first symptomatic manifestation of the disease.^{2–5}

In Spain, life expectancy currently reaches 80.2 years in men and 86.1 years in women.⁶ Given

the progressive aging of the population and the increased prevalence of gallstones in older adults, it is understandable why acute cholecystitis is becoming one of the most frequent causes of emergency surgery.

Home hospitalization is an alternative to inpatient stay that enables providing hospital-level care to patients in their home. To be eligible for home hospitalization, patients must meet certain criteria, such as being clinically stable, having an available caregiver and living within the reference area. A home care unit, usually comprised of nurses and physicians, can visit the patient at home to complement the care provided by the caregiver. Home hospitalization was pioneered in 1947 by the Montefiore Hospital in New York, and in 1951 it extended to Europe. In Spain, it was first implemented in 1981 by Gregorio Marañón Hospital.⁷

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Nowadays, home hospitalization forms part of standard services in many Spanish hospitals,^{8–10} and is especially widespread in Basque Country and Valencia.¹¹ In Catalonia, the first home care units appeared in 1997.¹²

For patients with acute cholecystitis, home hospitalization can be a valid option for completing the hospital treatment, such as parenteral antibiotherapy and/or wound care and drainage control after open or laparoscopic cholecystectomy. Availability of once- or twice-daily antibiotics and easy-to-use continuous perfusion pumps,^{13,14} as well as the use of the laparoscopic approach in cholecystectomy, allows for shortened inpatient stays and even avoidance of hospital admissions.¹⁵ At the same time, home care offers patients increased psychological and physical comfort, and a decreased risk of nosocomial infections.¹⁶

In 2010, the Department of General Surgery of our hospital implemented a new protocol for the management of acute cholecystitis, based on diagnosis, classification and treatment recommendations described in the Tokyo Guidelines 2007 and 2013.^{4,17,18} This protocol included a home hospitalization programme that was aimed at reducing the length of inpatient stay, while maintaining high standards of care. The objective of the present study was to analyse the effectiveness and safety of home hospitalization of patients with acute cholecystitis treated between June 2010 and December 2015 in our settings.

Methods

The present study was a retrospective analysis of the data collected in a patient registry set up by the Department of General Surgery of Arnau de Vilanova Hospital in Lleida, Spain.

Data from all patients diagnosed with acute calculous cholecystitis, who presented at the department between June 2010 and December 2015 and met selection criteria, were included into the database, including those who finished their treatment at hospital-at-home and those who received usual hospital care. The criterion for including patients in the database was referral from the emergency room with a primary diagnosis of acute calculous cholecystitis. The exclusion criteria were secondary diagnosis of acute calculous cholecystitis, acute acalculous cholecystitis, and concomitant acute pancreatitis, gastrointestinal cancer or bile duct diseases.

Diagnosis was made based on clinical, laboratory (Murphy's sign, acute upper abdominal pain, right hypochondrial tenderness, fever $>37.5^{\circ}\text{C}$ and/or white blood cell count $>10 \times 10^9/\text{L}$) and ultrasound criteria (thickened $>5\text{ mm}$ and oedematous gallbladder, distended

gallbladder, positive sonographic Murphy's sign, pericholecystic fluid, and gallstones). All cases were classified into grade I (mild), grade II (moderate) and grade III (severe) acute cholecystitis according to the Tokyo Guidelines.¹⁷ Grade I (mild) acute cholecystitis does not meet the criteria for grades II or III acute cholecystitis. Grade II (moderate) acute cholecystitis is associated with any one of the following conditions: (i) elevated white blood cell count ($>18\,000/\text{mm}^3$); (ii) palpable tender mass in the right upper abdominal quadrant; and (iii) duration of complaints $>72\text{ h}$; (iv) marked local inflammation (gangrenous cholecystitis, pericholecystic abscess, hepatic abscess, biliary peritonitis, emphysematous cholecystitis). Grade III (severe) acute cholecystitis is associated with dysfunction of any one of the following organs/systems: (i) cardiovascular dysfunction: hypotension requiring treatment with dopamine $\geq 5\text{ mkg/kg/min}$ or any dose of norepinephrine; (ii) neurological dysfunction: decreased level of consciousness; (iii) respiratory dysfunction: $\text{PaO}_2/\text{FiO}_2$ ratio <300 ; (iv) renal dysfunction: oliguria, creatinine $>2\text{ mg/dL}$; (v) hepatic dysfunction: prothrombin time international normalized ratio >1.5 ; and (vi) haematological dysfunction: platelet count $<100\,000/\text{mm}^3$.

The study population comprised all patients with mild or moderate acute calculous cholecystitis registered in the database described above. The following data were collected: age and sex, disease severity grade, medical history, anaesthetic risk according to the American Society of Anesthesiology (ASA) classification, presence of choledolithiasis, use of antibiotics, microbiological test results, home hospitalization, antibiotherapy duration, length of inpatient stay, length of home hospitalization, total length of hospitalization, readmissions, relapse and reason for home hospitalization.

In our hospital, laparoscopic cholecystectomy is the standard treatment for patients with mild or moderate acute cholecystitis, while treatment for severe cases is defined on an individual basis. However, due to various reasons, such as advanced age, poor overall health status (ASA grades III–IV), anticoagulant treatment, concomitant choledocholithiasis or patients' refusal to be operated on, some patients continue antibiotherapy without undergoing surgery.

All of the patients were initially assessed in the emergency room, and intravenous fluid therapy, analgesia, proton pump inhibitor and antimicrobial treatment were started. Antibiotherapy was continued both in case of surgical and conservative treatment, and was usually stopped upon normalization of white blood cell count and reduction of the initial C-reactive protein levels by half.^{19,20} The protocol of antimicrobial treatment in our hospital was as follows: (i) willingness of the patient; (ii) residency within 15–20 km from the hospital;

(iii) haemodynamic stability; (iv) tolerance of oral feeding; and (v) availability of a caregiver 24 h/day.

Criteria for home hospitalization were clinically-stable condition, an around-the-clock available caregiver, residency within 15–20 km from the hospital, willingness of the patient, oral feeding (patients are managed with oral feeding in admission if they do not having nausea or vomiting) and well-controlled drainage, when applicable.^{8,11,15} When a patient met all the criteria, the members of the home care unit and the surgeon in charge made the final decision together.

Patients with mild acute cholecystitis who did not undergo surgery and met the criteria for home hospitalization in the morning hours could chose to be home-hospitalized straight from the emergency room and continue antimicrobial treatment at home. The rest of the patients were admitted and continued anti-biotherapy or underwent urgent cholecystectomy per hospital protocol. Severe cases were treated in an individualized manner, with admission to the intensive care unit where necessary.

Admitted patients who did not undergo surgery, had no nausea or vomiting, tolerated oral feeding and met the rest of home hospitalization criteria were referred to hospital-at-home for the completion of antimicrobial treatment. Patients subjected to urgent surgery (only laparoscopic) were considered for possible home hospitalization 24–48 h postoperatively. If the patients tolerated oral feeding, were stable and had the drainage controlled, they were referred to hospital-at-home where they completed the antimicrobial treatment and had their drainage controlled and eventually removed (Fig. 1).

Table 1. Antimicrobial treatment for community-acquired acute cholecystitis

Treatment in hospital
• Grade I (mild) acute cholecystitis: ceftriaxone + metronidazole
• Grade II (moderate) acute cholecystitis: ceftriaxone + metronidazole, or ertapenem in patients >75 years or with risk factors
• Grade III (severe): piperacillin + tazobactam
In case of allergy
• Grade I (mild) acute cholecystitis: gentamycin + metronidazole
• Grade II (moderate) acute cholecystitis: gentamycin + metronidazole
• Grade III (severe): tigecycline + quinolone
Treatment in hospital-at-home
• Ertapenem
Treatment duration
• No cholecystectomy performed: 4–7 days
• Cholecystectomy performed: until 24 h after the surgery. Exception: in case of emphysematosis, vesicular necrosis, perforation or pericholecystic abscess the treatment is maintained for 4–7 days after the surgery.
• Bacteraemia: 2 weeks

Ertapenem is the standard antibiotic for outpatient parenteral antimicrobial treatment,^{21–25} as defined in our protocol (Table 1), due to its convenient dosing and ease of administration in home settings. Other antibiotics were a once-daily combination of ceftriaxone and metronidazole, and in severe cases, a combination of piperacillin and tazobactam. Patients and caregivers were instructed on the necessary care procedures, and a home care unit nurse visited the

Acute cholecystitis in the emergency department: Antibiotic IV

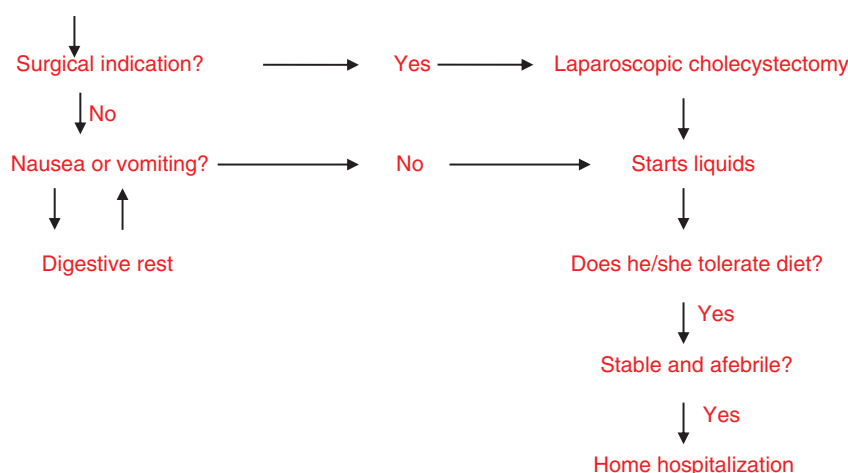


Fig. 1. Flowchart of income of home hospitalization. [Colour figure can be viewed at wileyonlinelibrary.com].

patient every day to start and stop the perfusion (in cases of pump perfusion or when required due to patient characteristics).

The antibiotics were prepared and administered as follows: (i) 1 g ertapenem was dissolved in 50 cL sterile saline and administered for 20 min once daily. Perfusion was stopped by the patient; (ii) 2 g ceftriaxone was dissolved in 100 cL sterile saline and administered for 20 min once daily; (iii) 1.5 g metronidazole in 300 cL ready solution was administered once daily for 60 min by gravity or with a small pump that regulated the speed of the perfusion and could be disconnected by the patient, the caregiver or the nurse. To administer the combination of the two drugs, the nurse would first administer ceftriaxone, then start the metronidazole perfusion and leave, unless the patient or caregiver was not capable of disconnecting the pump, in which case the nurse would stay until the perfusion was over and would finish the procedure; and (iv) 12 g/1.5 g piperacillin/tazobactam was dissolved in 100 cL sterile saline and administered daily via a continuous perfusion for 16 h, according to the local protocol. A nurse would help to start and stop the perfusion.

Our Home Hospitalization Unit is led by a surgeon and comprises nurses who have previously worked in hospitalization plants for surgical patients and who are, therefore, accustomed to its management and to detect early complications that might occur. During home hospitalization, a nurse from the home care unit would visit the patient every day to take vital signs, assess the wounds and drainages and dispense the antibiotics. Home care unit physicians received daily updates on the patient's state, and in case of detection of an alert, informed the surgeon in charge. Blood samples were taken at home, and if an image test was deemed necessary, the patient would visit the hospital during the day to make the test and would wait for the results at home. In case of readmission, the patient would go straight to the inpatient ward.

Initially, only patients living in the radius of 15–20 km from the hospital were considered candidates for home hospitalization, a restriction mostly defined by the feasibility of home care unit travel. Given the good initial results, upon completion of the study, this area could be expanded due to inclusion into the programme of the primary care centres in our reference area. In these cases, staff from the primary care centre visited the patients at home to administer once-daily antibiotics, while the surgeon and the home care unit followed the patient's evolution. After discharge from hospital-at-home, all patients were referred to the surgery department for control of patient or for scheduling elective cholecystectomy if necessary.

Statistical methods

As this was an exploratory study, no formal sample-size calculations were made. Quantitative variables were expressed as means and standard deviations (SD) or medians and ranges, and qualitative variables were expressed as frequencies and percentages. Categorical variables were compared using χ^2 -test or Fischer's exact test. Continuous variables were compared using the Mann–Whitney *U*-test or Student's *t*-test; one-way analysis of variance was used to assess differences between more than two groups of patients. The level of statistical significance was set at $P < 0.05$. SPSS version 19.0 (IBM, Armonk, NY, USA) was used for the statistical analysis.

Results

Patient disposition

A total of 1007 patients with acute calculous cholecystitis presented at our surgery department between June 2010 and December 2015. The mean age was 70 years (SD: 16, range: 15–99 years), and 577 (57.3 per cent) patients were males. Most had mild (351, 34.5 per cent) or moderate (564, 42.7 per cent) acute cholecystitis, while 92 (9.1 per cent) patients had severe disease.

For the purpose of the present study, we decided not to include cases of severe acute cholecystitis in the analysis because of their low number and their distinct and heterogeneous clinical characteristics. Thus, the study population comprised of 915 patients with mild or moderate acute calculous cholecystitis. Of those, 147 (16 per cent) patients completed their treatment in hospital-at-home: 134 (14.6 per cent) patients finished their antimicrobial treatment in hospital-at-home, and 13 (1.4 per cent) patients received wound care and had their drainage controlled at home. Demographic and clinical characteristics of all the patients who completed their treatment in the hospital or at home are presented in Table 2. There were no significant differences between the groups in regards to the age, sex, medical history, ASA categories, severity of acute cholecystitis and type of treatment (surgery/conservative). A total of 295 (32.2 per cent) of patients were >80 years.

Laparoscopic cholecystectomy was carried out in 521 (56.9 per cent) patients. Significantly more ($P < 0.001$) patients with moderate cholecystitis (364/563, 64.5 per cent) underwent surgery compared to patients with mild cholecystitis (157/352, 44.6 per cent). On the whole, home hospitalization was somewhat more frequent among patients who did not undergo surgery (72/394 nonoperated patients, 18.3 per cent vs 75 of 521 operated patients, 14.4 per cent, $P = 0.1$). This misbalance was mostly due to

Table 2. Demographic and clinical characteristics of the patients hospitalized at home and in hospital

	Home hospitalization (<i>n</i> = 147)	Conventional hospitalization (<i>n</i> = 768)	<i>P</i> -value
Age in years, mean $\pm$ SD	68.6 $\pm$ 16.7	69.4 $\pm$ 17.2	0.6
>80 years old, <i>n</i> (per cent)	43 (31.4 per cent)	252 (32.8 per cent)	0.7
Males, <i>n</i> (per cent)	89 (60.5 per cent)	436 (56.8 per cent)	0.2
Diabetes, <i>n</i> (per cent)	30 (21.9 per cent)	202 (26.3 per cent)	0.1
Mild acute cholecystitis, <i>n</i> (per cent)	50 (34 per cent)	301 (39.2 per cent)	0.2
Moderate acute cholecystitis, <i>n</i> (per cent)	97 (66 per cent)	467 (60.8 per cent)	0.2
ASA grade III–IV, <i>n</i> (per cent)	38 (27.7 per cent)	258 (33.6 per cent)	0.1
Previous gallbladder diseases, [†] <i>n</i> (per cent)	11 (7.5 per cent)	50 (6.5 per cent)	0.6
Cholelithiasis, <i>n</i> (per cent)	4 (2.7 per cent)	39 (5.1 per cent)	0.2
Most invasive treatment, <i>n</i> (per cent)			
Cholecystectomy	75 (51 per cent)	446 (58.1 per cent)	0.1
Antibiotherapy	68 (46.3 per cent)	309 (40.2 per cent)	0.1
Cholecystectomy	4 (2.7 per cent)	14 (1.8 per cent)	0.4
Antibiotherapy in hospital-at-home, <i>n</i> (per cent)			
Ceftriaxone–metronidazole	15 (10.2 per cent)		
Ertapenem	114 (77.6 per cent)		
Piperacillin–tazobactam	9 (6.1 per cent)		
Length of antibiotherapy, mean $\pm$ SD	6.63 $\pm$ 2.2	7.03 $\pm$ 3.7	0.1
Complications, <i>n</i> (per cent)	9 (6.1 per cent)	82 (10.7 per cent)	0.1
Clavien grade $\geq$ II	9 (6.1 per cent)	70 (9.1 per cent)	0.2
Mortality, <i>n</i> (per cent)	0 (0 per cent)	3 (0.4 per cent)	0.5
Readmission <30 days, <i>n</i> (per cent)	3 (2.0 per cent)	22 (2.9 per cent)	0.5
Relapse, <i>n</i> (per cent)	11 (17.7 per cent)	68 (21.1 per cent)	0.5
Inpatient stay (days), mean $\pm$ SD	3.3 $\pm$ 2.9	5.3 $\pm$ 4.2	<0.001
Total length of hospitalization, mean $\pm$ SD	8.8 $\pm$ 4.3	5.3 $\pm$ 4.2	<0.001

[†]Previous gallbladder diseases: cholecystitis, pancreatitis, cholangitis, choledocholithiasis.
ASA, American Society of Anesthesiologists; SD, standard deviation.

patients with mild disease: among the 157 operated patients with mild cholecystitis, only 15 (9.6 per cent) were referred to hospital-at-home, probably due to the short duration of postsurgery antibiotherapy, whereas of the 195 nonoperated patients with mild cholecystitis, 35 (17.9 per cent) were home hospitalized ($P = 0.03$). In contrast, the proportion of home hospitalizations was similar between operated patients with moderate cholecystitis (60/364, 16.5 per cent) and nonoperated patients with moderate cholecystitis (37/199, 18.6 per cent).

Most patients with cholecystostomy were discharged home with it closed; four patients who presented with persistently-elevated debit were also controlled with home hospitalization.

The most frequent antibiotic used in patients hospitalized at home was ertapenem, whereas a minority of patients was treated with ceftriaxone–metronidazole or piperacillin–tazobactam. Moderate cholecystitis was associated with longer duration of antibiotherapy (5.9 $\pm$ 1.9 days vs 7.0 $\pm$ 2.3 days, $P = 0.005$), longer hospital stay 2.4 $\pm$ 1.0 days vs 3.7 $\pm$ 3.3 days, $P = 0.02$), and longer total duration of hospitalization (7.5 $\pm$ 2.7 days vs 9.3 $\pm$ 4.7 days; $P = 0.004$), compared to mild cholecystitis.

There were no significant differences in most outcomes (complication rate and grade,²⁶ mortality,

readmission rate or relapse rate) between the home hospitalization and conventional hospitalization groups. Of the nine complications registered in home-hospitalized patients, five were detected during the inpatient stay (3 cases of wound infections, 1 case of acute kidney failure and one case of intraabdominal infection), and three during the home hospitalization (a nosocomial pneumonia treated at home, a case of acute pain that required readmission and a case of intraabdominal infection that also required readmission). One complication (decompensated heart failure) was detected after discharge from hospital-at-home and required readmission. Compared to conventional hospitalization, home hospitalization was associated with a shorter inpatient stay (3.3 $\pm$ 2.9 days vs 5.3 $\pm$ 4.2 days, $P < 0.001$) and longer total hospitalization (8.8 $\pm$ 4.3 days vs 5.3 $\pm$ 4.2 days, $P < 0.001$) due to the prolonged clinical control by the home care unit. However, the duration of the antibiotherapy was unaffected: 6.6 $\pm$ 2.2 days in the home hospitalization group and 7.0 $\pm$ 3.7 days in the conventional hospitalization group ($P = 0.1$).

Discussion

Laparoscopic cholecystectomy is considered the gold standard for treatment of acute cholecystitis. Studies

have demonstrated that early cholecystectomy is associated with shorter hospital stay, lower complication rates and reduced hospital spending.^{27–30} However, as many older patients present with conditions that increase surgery risk, or directly refuse surgical treatment, a conservative treatment sometimes has to be considered, which could lead to a prolonged hospital stay.^{31–33} This can be seen in the present study, as almost one-third of our patients were >80 years.

Home hospitalization is a valid alternative to inpatient stay that permits patients with mild or moderate acute cholecystitis to complete antimicrobial treatment in their homes, both after an emergency cholecystectomy and in the case of conservative treatment. Some studies have found that conservative treatment and the home hospitalization of patients with acute cholecystitis after an observation in a short-term admission unit was effective and safe.¹⁵ Concordantly, 10 patients in our study could be referred to hospital-at-home straight from the emergency room, avoiding admission.

Among the admitted patients, those who could be referred to hospital-at-home were identified and were offered to complete their treatment in their homes; patients could finish antibiotherapy, have their wounds and drainage controlled and have blood samples taken, among other procedures.⁸

The outpatient antimicrobial treatment was adjusted to hospital protocols. Currently, a variety of antibiotics can be used in outpatient settings, as confirmed by studies by GESTADE (Grupo Español de Seguimiento del Tratamiento Antibiótico Endovenoso Domiciliario) and others.¹⁶ These studies have shown that the availability of portable, easy-to-control pumps, patient/caregiver education and nurse assistance enable successful treatment of nosocomial infections in the home. We would suggest the use of once-daily antibiotics whenever compatible with the culture test results and recommendations of the Hospital Nosocomial Infection Unit.

In our study, the standard antibiotic used in hospital-at-home was ertapenem, which is included in our hospital protocol and in protocols elaborated on by GESTADE for outpatient parenteral antimicrobial treatment,¹³ although other antibiotics were used when necessary. Importantly, we observed that home hospitalization did not affect the duration of antibiotherapy, which was similar for patients who stayed in the hospital and those hospitalized at home.

The results of our study suggest that hospitalization at home is an effective and safe treatment option for selected patients with acute calculous cholecystitis, given that there were no significant differences in the rate of complications, mortality, readmissions and

relapses between the inpatient and home-hospitalized groups. Our results are consistent with previous studies, such as that by Rodrigues-Cerrillo *et al.*, which followed 25 nonoperated patients with acute cholecystitis who received antibiotic treatment in their home. In that study, all the patients had a favourable course and did not require readmission within 30 days.¹⁵

The only unexpected finding in our study was the increase in the total hospital stay in patients hospitalized at home. Although the inpatient stay in this group was shorter and the duration of antibiotherapy was similar to the conventional hospitalization group, the prolonged control by the home care unit led to an increase in the total hospitalization length. One explanation for this phenomenon could be that old age and the overall fragile state of our patients, in the absence of the pressure 'to free the hospital bed', predisposed the home care unit to prolong the control. A similar tendency was observed in several other studies.³⁴ A possible solution to this problem could be coordination between the hospital and the primary care and transfer of the follow up to the patient's general practitioner after antibiotic discontinuation. In fact, primary care centres can also be involved in caring for patients in their homes before antibiotic discontinuation. Thus, our home hospitalization programme for acute cholecystitis was recently extended to include primary care nurses who visit home-hospitalized patients to administer once-daily antibiotics, whereas the surgeon and the home care unit follow patients' clinical evolution. This scheme has enabled the area covered by the programme to be extended.

Home hospitalization allowed saving, on average, two bed-days per patient, which could be allocated to treat other patients. This is important, given the shortage of beds experienced by many hospitals.

These are the limitations of the study, such as its observational character and the nonrandomized assignment of patients to the treatment groups. Thus, the baseline characteristics were not perfectly balanced between the two groups (conventional and home hospitalization), which should be taken into consideration when interpreting the results. However, the geographical dispersion of the population in our area and the limitations imposed by travel distances impeded inclusion of many otherwise eligible patients into the home-hospitalization group. As a result, the proportion of patients in the home-hospitalization group was much lower than that of the conventional hospitalization group. However, the large total number of patients allowed for collecting sufficient data to confirm the satisfactory results of home hospitalization in patients with acute calculous cholecystitis.

Conclusions

In the present study, home hospitalization was an effective and safe alternative to conventional hospitalization in selected patients with acute calculous cholecystitis. Home hospitalization enabled applying hospital protocols, while reducing inpatient stay, and even avoiding admission in some cases. Although home hospitalization in the present study was not associated with a reduction of direct costs, it allowed for reducing the use of acute hospital beds, which could be dedicated to other patients. Coordination between home care units and primary care could make home hospitalization available to a larger number of patients, who generally show high satisfaction from being treated in their homes.

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Declaration of conflict of interests

The authors declare no conflict of interests.

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