

Construction and Analysis of Risk Model of Postoperative Stone Recurrence in Patients with Cholelithiasis: A Protocol-Based KAP Questionnaire Approach

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Abstract

Background

Patients who undertake endoscopic stone removal had a chance to have CBDS recurrence, which can lead to many severe complications. Many risk factors cause the recurrence of CBDS, but many factors cannot be controlled by clinical intervention. As for the patients in daily life, healthy lifestyle is important to prevent the recurrence of CBDS. The questionnaire of KAP can collect the real information about patients and guide the clinical work.

Methods

100 CBDS recurrence patients after surgery in our hospital were enrolled. A pair of self-designed questionnaires on KAP were used to collect data and assess the KAP towards CBDS recurrence.

Results

The mean score for KAP of CBDS recurrence patients was 30.29 ± 2.87 , 26.42 ± 3.53 and 27.23 ± 3.48 . Pearson correlation analysis showed that knowledge aspect score and attitude score were significantly positively correlated with practice score ($r=0.384, 0.309$; $P<0.001, 0.002$). Further Pearson regression analysis revealed that the knowledge and attitude, education, Type 2 diabetes, were significantly associated with the practice of patients.

Conclusion

The CBDS recurrence patients had a good command of knowledge, but had negative attitude and poor performance in practice.

Introduction

Cholelithiasis, which refers to the formation of gallstones and may present with or without obvious symptoms, is a common disease in all over the world. The overall the number of cholelithiasis patients has reached more than 100 million, occurring in 5%–22% people in the western countries and the incidence in China is about 8%–10% and is still increasing. [1,2] According to the Korea article, after endoscopic stone removal, 11.3% patients still had CBD stone recurrence. [3] Several studies reported recurrence rates of CBD stones ranging from 2 to 22%. [4–11] Common bile duct stone recurrence, as a late complication, is a major concern because it can lead to cholangitis and biliary sepsis, which may cause septic shock, even death. Although many risk factors influence the recurrence of the CBD stone, nonmodifiable risk factors cannot be controlled by clinical intervention. Modifiable risk factors, such as obesity, rapid weight loss, rapid weight loss cycling, high-calorie diet, medications, type 2 diabetes, metabolic syndrome, dyslipidemia, smoking, and sedentary lifestyle, are the key to prevent the recurrence of CBD stone. [12] However, some patients who suffered the recurrence of CBD stone may did not have a good command of the healthy lifestyle. Some may have a good sense of knowledge, but they do not have a good attitude or practice. Therefore, surveys of knowledge, attitude, and practice (KAP) can collect information on what is known, believed, and done by the patients who had the recurrence of CBDS. [13] Such information is necessary because unclear information and wrong attitude toward bad behavior, even bad outcomes. [14] This article aims to collect the real information about patients and guide the clinical work.

Methods

Ethical Approval

The study was approved by ethical review board of Jinan central hospital.

Study population

This study was conducted among 100 patients who experienced laparoscopic cholecystectomy or endoscopic stone removal and then had recurrence of CBDS in Shandong First Medical University affiliated Jinan central hospital from 2019-2023.

Questionnaire design

The questionnaire was divided into four parts: basic information of patients, knowledge about CBD, attitude towards CBD and efforts to prevent recurrence of CBD.

1. Basic information of patients

This part includes gender, age, education background, income per mouth , occupation, BMI, Hypertension and Type IIdiabetes.

2. Knowledge

The second part, which has 11questions, is the knowledge of CBD, which consists of the concept of gallstone, the symptom of CBD, the inducing factor of CBD recurrence and the treatment methods. Respondents were required to choose "yes" ,"no" or "not sure" answers for this section.

3. Attitude

The third part is composed of 7 questions. This part mainly reflects the patient's attention to the recurrence of stones. The respondents were required to choose

one of the five options provided which are "strongly agree", "agree", "not sure", "disagree" and "strongly disagree".

4. Practice

7 questions are constructed of this part. This part includes the dietary habit of patients, exercise, reexamination and mentality. The respondents were required to choose "always", "usually", "neutrality", "occasionally" and "never".

Data collection and statistics.

Data were analyzed using SPSS 26.0. Frequencies and percentages were calculated for all variables, which are related to the objectives of the study. Besides, the relationships between knowledge, attitudes, and practice scores were examined using bivariate correlation analysis. The study result was presented by using tables and graphs and interpreted by using OR and P value. Pearson correlation analysis was used to analyze the correlation of continuous variables. Multiple linear regression was used for multi-factor analysis. A P value less than 0.05 was considered as statistically significant.

Results

General information description.

The gender composition of 98 patients was evenly split between females (50.0%) and males (50.0%). In terms of age composition, the elderly population constituted the largest proportion (66.33%), while the young population represented the smallest fraction (6.12%). The urban population accounted for the majority (80.61%), whereas the suburban population comprised a smaller portion (9.18%). Regarding education level, college/bachelor students constituted the largest group (40.82%), while individuals with master's degrees or higher made up the smallest percentage (4.08%). Regular workers outnumbered non-regular workers, comprising 56.12% and 43.88% respectively in their respective compositions. When considering monthly per capita income distribution, individuals falling within the "5000-10000" range formed the largest segment at 35.71%, whereas those earning "20000" had the lowest representation at 12.24%. The number of participants without hypertension exceeded those with hypertension, accounting for 72.45% and 27.55% respectively in their respective compositions. There were more individuals without diabetes compared to those with diabetes, as indicated by percentages of 87.76% and 12.24%, respectively. The overall process is shown in Table 1.

The score of knowledge, attitude and practice.

The knowledge aspect score of 98 cases in this study was (30.29 ± 2.87) , ranging from 21 to 33. The attitude aspect score was (26.42 ± 3.53) , and the score ranged from 19 to 35. The practice aspect was (27.23 ± 3.45) , and the score ranged from 19 to 35. The overall process is shown in Table 2.

Analysis of differences between basic information and practice scores.

The T-test for two independent samples and one-way analysis of variance revealed no statistically significant differences between groups in terms of gender, BMI, residence, ethnicity, formal employment status, and monthly per capita income ($P > 0.05$). However, there were significant differences observed in the age "youth" practice score compared to "middle age" and "old age" ($P < 0.05$). Additionally, the practice scores

Table 1. Characteristics of the respondents

Demographic variables	n	%
Gender		
male	49	50.00
female	49	50.00
Age		
young age	6	6.12
middle age	27	27.55
old age	65	66.33
BMI		
low	8	8.16
normal	62	63.27
overweight	23	23.47
obesity	5	5.10
Educational attainment		
Primary school and below	20	20.41
Junior high school/ Senior high school/ Technical secondary school	34	34.69
Junior college/ Undergraduate course	40	40.82
Master degree or above	4	4.08
Regular employee		
yes	55	56.12
no	43	43.88
Income per month		
<5000	20	20.41
5000-10000	35	35.71
10000-20000	31	31.63
>20000	12	12.24
Hypertension		
yes	27	27.55
no	71	72.45
Type 2 diabetes		
yes	12	12.24
no	86	87.76

Table 2. The score of knowledge, attitude and practice

	n	Range of scores	Score
Knowledge aspect	11	21 33	30.29±2.87
Attitude aspect	7	19 35	26.42±3.53
Practice aspect	7	19 35	27.23±3.48

for individuals with an education level of "primary school and below" or "junior high

school/senior high school/technical secondary school" were lower than those with a level of "junior college/undergraduate" or "master's degree and above" ($P < 0.05$). Furthermore, practice scores were higher among participants with hypertension or diabetes compared to those without these conditions ($P < 0.05$). Please refer to Table 3 for more details.

Table 3. Analysis of differences between basic information and practice scores

	n	Score	F/t	P
Gender			-0.433	0.666
male	49	27.08 ± 3.66		
female	49	27.39 ± 3.33		
Age			13.541	<0.001
young age	6	32.67 ± 1.37		
middle age	27	28.67 ± 2.70 ^a		
old age	65	26.31 ± 3.35 ^{ab}		
BMI			2.583	0.058
low	8	25.25 ± 2.43		
normal	62	27.85 ± 3.10		
overweight	23	26.78 ± 4.11		
obesity	5	24.80 ± 4.66		
Educational attainment			8.218	<0.001
Primary school and below	20	25.10 ± 3.71		
Junior high school	34	26.62 ± 3.01		
Senior high school				
Technical secondary school				
Junior college	40	28.35 ± 3.04 ^{ab}		
Undergraduate course				
Master degree or above	4	32.00 ± 2.00 ^{abc}		
Regular employee			1.236	0.220
yes	55	27.62 ± 3.60		
no	43	26.74 ± 3.31		
Income per month			2.440	0.069
<5000	20	25.95 ± 3.05		
5000-10000	35	26.83 ± 3.39		
10000-20000	31	28.45 ± 3.75		
>20000	12	27.42 ± 3.06		
Hypertension			3.943	<0.001
yes	27	29.33 ± 2.65		
no	71	26.44 ± 3.45		
Type 2 diabetes			7.730	<0.001
yes	12	31.67 ± 1.92		
no	86	26.62 ± 3.20		

Correlation analysis of knowledge score, attitude score and practice score.

Pearson correlation analysis showed that knowledge aspect score and attitude score were significantly positively correlated with practice score ($r=0.384, 0.309$; $P<0.001, 0.002$). The overall process is shown in Table 4.

Table 4. Correlation analysis of knowledge score, attitude score and practice score

Variables	Practice score	
	r	P
Knowledge score	0.384	<0.001
Attitude score	0.309	0.002

Multiple linear regression analysis about practice scores.

Further Pearson regression analysis revealed that the knowledge and attitude, education, Type 2 diabetes, were significantly associated with the practice of patients. The overall process is shown in Table 5.

Table 5. Multiple linear regression analysis about practice scores

Variables	β	SE	t	P	95% CI	
(constant)	13.194	2.985	4.421	<0.001	7.262	19.125
Age	Reference	Old Age				
young age	1.430	1.551	0.922	0.359	-1.652	4.512
middle age	1.164	0.627	1.856	0.067	-0.082	2.410
Educational attainment	Reference	Primary School and below				
Junior high school	0.618	0.744	0.831	0.408	-0.860	2.097
Senior high school						
Technical secondary school						
Junior college	1.650	0.753	2.191	0.031	0.153	3.147
Undergraduate course						
Master degree or above						
Hypertension	Reference					
yes	1.317	0.634	2.077	0.041	0.057	2.576
Type 2 diabetes	Reference					
yes	2.839	1.027	2.764	0.007	0.798	4.880
Knowledge score	0.220	0.103	2.317	0.035	0.015	0.425
Attitude score	0.197	0.084	2.351	0.021	0.031	0.364

Note: The fitting model has an $F=10.027$, $P<0.001$, an R-squared $R^2=0.506$, and an adjusted $R^2=0.456$.

Discussion

This research studied the basic information and KAP of 100 patients who have the recurrence of CBDS after operation. The data of collected questionnaire was analyzed

by statistics.

As for clinical doctors, they continually explore and study the way of reducing the rate of recurrence of CBDS by surgical operation and medicine drugs [15–17]. The reason of recurrence of CBDS after operation was classified by clinical doctors as the bacteria, abnormal biliary structure, inflammation, endoscopic and surgical treatment, and so on. However, congenital factor and iatrogenic cannot be controlled by patients [18]. According to Indian study, factors other than long-chain unsaturated fatty acids such as low green vegetables and excess sugar in diet predispose an individual to choledocholithiasis [19]. Changing some habits in life is the key factor to prevent the recurrence of CBDS. Through the way of questionnaire, the reason of stone recurrence can be analyzed from the perspective of patients.

From the results of this questionnaire, many factors influence the recurrence of CBDS. Some factors can be predicted before this questionnaire, while some factors are beyond designer's expectation.

Age

In this questionnaire, elderly people (older than 60 years old) who had the recurrence of CBDS account for the highest proportion, and the proportion of young people (18–44 years old) is the least. These data are in accordance with results from previous research [20].

From the KAP questionnaire, the score for practice among young group was higher than middle-aged group and elderly group. The reason should be related to the generally high level of education and the strong ability execution of young people. Although the score of young group was highest in three groups, the rate of recurrence of CBDS still exist. This result should be related to the nonmodifiable risk factors.

Education

From the aspect of the education background, the higher level of education, the higher score of KAP. The high score is due to the high level education patient's understanding of professional medical knowledge.

Type 2 diabetes

Type 2 diabetes, as one of the most common disease in the world, is regarded as a modifiable risk factor for the recurrence of CBDS. Practicing effective behavior management of the diet in type 2 diabetes patients can result in improved medical outcomes (decrease in cholesterol). [21, 22] From the result, the score of practice among patients who had type 2 diabetes is higher than patients who hadn't. Patients who had type 2 diabetes would long-term follow-up with hospital. Therefore, patients would have more opportunity to do reexamination about Hepatobiliary. Furthermore, because of the effective behavior management of diet in type 2 diabetes, patients who had the recurrence of CBDS also benefit from the developed good behavior. Due to the effects of long-term chronic diseases, the attitude of patients, especially No. 27 (It is important to improve life habits to prevent recurrence of stones), No. 28 (The recurrence of choledocholithiasis not only depends on the success of surgery, but also is closely related to personal protection), No. 29 (It doesn't bother me to change my lifestyle to prevent recurrence), also had a high score.

KAP

This questionnaire was divided into 4 parts, basic information and KAP (knowledge, attitude and practice). 11 questions made up the Knowledge part. 7 questions made up

the Attitude part and 7 questions made up the Practice part. From the total scores of three parts, the Knowledge part has the highest score, while the score of Attitude and Practice has little difference. Therefore, we can conclude that patients who had recurrence of CBDS had a good command of knowledge of CBDS recurrence, but they had a bad attitude towards long-term follow-up, which lead to the low score of practice. In the part of practice, the score of patients is low, especially No.25(The recurrence of CBDS is not only dependent on the success of surgery, but also closely related to personal protection), No.26(Regular visits to the hospital will not be a problem for my life), No.27(It would not be painful for me to change my lifestyle to prevent recurrence). In the question of No25., the surgery did play a main role in the recurrence of CBDS, the personal protection also plays an important role in the recurrence of CBDS. Many patients believe that the surgery can solve all problems, and would not worry about the recurrence. Therefore, patients did not pay more attention to the personal protection and follow-up, which lead to the wrong attitude towards follow-up and changes in lifestyle habits. In the No26. question, most patients after surgery would come back to normal life and regular work, and they can't spare much time to visit hospital. Regardless of the objective factors of fast-paced life, patients' negative attitudes towards going to hospital should not be ignored.

Good attitude determines good behavior. Because of the wrong attitude of some patients, negative practice was conducted, even lead to the recurrence of CBDS. Therefore, a good command of knowledge, positive attitude and practice can reduce the rate of CBDS recurrence.

Conclusion

To conclude, this paper suggests that basiliximab and ATG show no significant differences in DGF, graft loss, 1 year patient/graft survival rates as induction therapies during the perioperative period of living related renal transplantation. However, ATG-treated patients have higher incidence rates of infections, in particular to the respiratory tract and certain viral infections. This study had limitations. Due to limited sample size and short follow-up, the results may be biased. Therefore, large studies with longer follow up are needed to confirm these findings.

Author Contributions

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