OPEN ACCESS

PEER-REVIEWED JOURNAL

SCIENCE REVIEW

Scientific Edition

Published by:

World Science

RS Global

Open Access Peer-reviewed Journal

Science Review

1(8), January 2018
Vol.3

Publisher –
RS Global Sp. z O.O.,

Scientific Educational Center
Warsaw, Poland

Numer KRS: 0000672864
REGON: 367026200
NIP: 5213776394

Publisher Office's address:
Dolna 17,
Warsaw, Poland,
00-773

Website:
https://ws-conference.com/
E-mail:
rsglobal.poland@gmail.com
Tel:
+4(857) 898 55 10

STUDY OF QUALITY OF LIFE OF PATIENTS AFTER SURGICAL TREATMENT OF COMPLICATED FORMS OF CHRONIC PANCREATITIS

[1]MD, professor Kryvoruchko I. A.,
[1]PhD, Associate professor Goncharova N. M.,
[1]MD, professor Teslenko S. N.,
[1]resident Drozdova A. G.,
[2]surgeon of the first category Suplichenko M. V.,
[2]surgeon of the first category Paunov K. E.,
[2]surgeon of the high category Antonuk V. P.

Ukraine, Kharkiv,
[1]Kharkiv national medical university, department of surgery №2;
[2]Communal Healthcare Establishment «Regional Clinical Hospital – Emergency Medical Center and Disaster Medicine Center»

Abstract. *The problem of studying the quality of life of patients with complicated forms of chronic pancreatitis in the postoperative period is rather complicated, therefore the purpose of this study was to study the quality of life of patients after surgical treatment of complicated forms of chronic pancreatitis using SF-36 and GSRS questioners and also multivariate statistical methods: agglomerate and divisimic cluster analysis, discriminant analysis, methods of data mining of classification tree.*

Keywords: *quality of life, chronic pancreatitis, surgical treatment.*

Introduction. In the domestic and foreign literature of recent years a wide range of works on the study of various medical aspects of the quality of life problem is given. According to a number of authors, the importance of studying the quality of life is primarily due to the fact that it is not always possible to establish a direct correlation between the severity of the disease and the quality of life, which is largely determined by the subjective representations of the patient about his condition [2, 9]. To date, there are many methods for assessing the quality of life that can be divided into two broad groups: general and special. With the help of general methods, all components of the quality of life in general are studied, and with the help of special ones one component (physical state, emotional or social function) or quality of life of patients with only certain diseases [9, 10]. So, studying the quality of life in our case can be considered special, because only a group of patients who are ill with complicated forms of chronic pancreatitis are studied and have been operated.

According to the World Health Organization, there is a tendency towards an increase in the incidence of chronic pancreatitis among the population, including an increase in the number of patients with its complicated forms. In the world, the prevalence of chronic pancreatitis ranges from 26.5 to 50 cases per 100,000 population [3, 5, 6].

The problem of studying the quality of life of patients with complicated forms of chronic pancreatitis in the postoperative period is rather complicated, therefore, it is widely discussed among therapists and among surgeons. In spite of the elimination of the pain syndrome, the patients still have a violation of the exocrine function of the pancreas, progressing endocrine insufficiency, which contributes to the physical exhaustion of this category of patients [3, 5].

Chronic pancreatitis is a disease with a progressive course, an increased level of pain, various dyspeptic disorders, which requires the patient to constantly adhere to the diet, sometimes with constant substitution and anesthetic therapy [4, 7]. Early clinical manifestations of chronic pancreatitis - reduced ability to work, increased fatigue, decreased mood, vivacity. The most significant changes in the state of health are observed in patients with chronic pancreatitis during the relapse of the disease, with the progression of pancreatic dysfunction, when a complex of changes arises due to the development of persistent pain and dyspeptic syndromes [7]. The quality of life of patients with chronic pancreatitis is significantly reduced in comparison with a practically healthy group of people, both in terms of physical and mental health [8, 9]. Lowering the quality of life of patients depends on the long-term course of the disease, the incidence of exacerbations and complications of chronic pancreatitis. The quality of life is significantly influenced by the severity of postoperative attacks of acute pancreatitis [6, 7]. In addition to determining the effectiveness of treatment, assessing the quality

of life in complicated chronic pancreatitis may also have a prognostic value, for example, in the event of a relapse of the disease [2, 8]. The literature contains data on the use of general questionnaires in patients with chronic pancreatitis. These are the Melzak Pain Scale (MPS), the Pain Treatment Responsive Scale (PTRS), the Specific Activity Scale (SAS). The most commonly used questionnaire for MOS 36-Item Short-Form Health Survey (SF-36), Sickness Impact Rogofile (SIP), Nottingham Health Profile (NHP), Visual Analog Scale of Pain (VASP) Gastrointestinal Symptom Rating Scale (GSRS) [2, 8, 9, 10].

The aim of the study. The aim of the study was to study the quality of life of patients after surgical treatment of complicated forms of chronic pancreatitis using SF-36 and GSRS questionnaires.

Materials and methods. Evaluating the quality of life of patients operated on complicated forms of chronic pancreatitis was performed on the basis of data from 115 patients received with SF-36 and GSRS questionnaires containing 13 indicators, as well as age, sex, method of surgical treatment and time elapsed since the moment of the operation until the polling date. Surveys of SF-36 and GSRS were conducted through voluntary correspondence with patients.

For modeling and predicting the quality of life, multivariate statistical methods were used: agglomerate and divisimic cluster analysis, discriminant analysis, methods of data mining of the classification tree [1].

Results of the research and their discussion. All patients were operated at different times for complicated forms of chronic pancreatitis. Evaluated the quality of life in 9 patients who performed resection of the pancreas; in 34 patients - duodenoprotective resection of the head of the pancreas with drainage; in 27 patients - drainage operations and in 45 patients - symptomatic operations.

After the correlation analysis, in some cases, some of the indicators were excluded from the consideration because they had a very large connection (the Spirman correlation coefficient sometimes exaggerated 0.8 - the Chaddock scale corresponds to a strong correlation that is not recommended when using the majority multidimensional statistical methods [1]. To such indicators (for them the reliable coefficient of pair correlation Spirman exaggerates 0,7) could be attributed: emotional functioning, viability, social functioning, diarrheal syndrome, physical functioning.

The natural classification of patients was determined by the methods of cluster analysis [1] in two stages. In the first stage, using the agglomerative methods of tree-like clusterization, the optimal number of homogeneous groups of partition (clusters) was determined. Before the start of the analysis, the standardization of all indicators was carried out.

The obtained partition proved to be very stable in relation to methods of hierarchical association into clusters (single connection, complete connections, Ward method, etc.), and to the metric used (Euclidean, step distance of Minkowski, Manhattan distance city, districts, etc.).

In the second stage of the classification, for the qualitative composition of the three groups (clusters) to be used, the k-mean divisive method was used. According to a given number of clusters (3) there was a breakdown of objects (patients) into clusters to minimize the variability within clusters and to maximize the differences between clusters. Numerous experiments were selected indicators that allowed the classification to be considered appropriate definition of the concept of quality of life: 1 cluster - good quality of life = 1; 2 cluster - satisfactory quality of life = 2; 3 cluster - unsatisfactory quality of life = 3.

To identify a mathematical model for determining the quality of life, we turned to a multidimensional discriminant analysis, which was reduced to the definition of discriminant variables (most inormative in terms of classification problems), the construction of a set of canonical discriminatory and classification functions, followed by their analysis [1].

When selecting discriminant variables with 14 input indicators, only 9 were used (others were excluded due to multicollernarity - a strong connection with other indicators). Selection of the remaining 9 discriminant variables was gradually introduced by the inclusion or exclusion of variables according to their level of tolerance by the degree of excess of predictors for classification. Classification, that is, prediction of the quality of life of any patient occurred after reading the values of each classification function for this patient. The patient referred to the group of quality of life, the classification function of which was maximal.

Good quality of life = -23,13 + 0,156 x role function + 0,076 x dyspeptic syndrome + 1,19 x x abdominal pain + 0,36 x mental health + 0,05 x constipation syndrome;

Satisfactory quality of life = -14,83 + 0,011 x role function + 0,78 x dyspeptic syndrome + + 0,93 x abdominal pain + 0,26 x mental health - 0,024 x constipation syndrome;

Poor quality of life = -25.1 - 0.023 x role function + 1.01 x dyspeptic syndrome + 1.72 x x abdominal pain + 0.17 x mental health + 0.3 x constipation syndrome.

An analysis of the canonical roots, which divided the groups studied in the quality of life, allowed to substantiate the significance of discriminatory functions. By the value of the standardized coefficients in the canonical roots and the factor structure matrix, it was possible to rank discriminant variables by classification according to their importance in the following order: role-playing, dyspeptic syndrome, abdominal pain, mental health, constipation syndrome. As a consequence of the canonical analysis, the first canonical root allowed the separation of good quality of life from others. The main contribution to the work of the first canonical root was introduced by indicators of role function and dyspeptic syndrome, smaller, but co-measurable indicators of abdominal pain and mental health. The second canonical root separated unsatisfactory quality of life from satisfactory, using abdominal pain and constipation syndrome as the main parameters. The results of the aposteriori classification indicated the accuracy of prediction based on the classification functions. The analysis, in general, provided very high classification accuracy, as in the whole sample (115 patients) (91.3 %) and separately in groups.

For a more visual, but no less accurate method, the classification trees were used. The decision tree is organized in the form of a hierarchical structure that consists of decision-making nodes for evaluating the values of certain variables for predicting the resulting value. In the simplest form, the classification tree is a way of representing rules in a hierarchical sequential structure. The basis of such a structure - the answer "Yes" or "No" on a number of issues. Most statistical methods are parametric, but it is necessary to assume in advance which kind of distribution has data. Tree solutions, in contrast to such methods, construct nonparametric models. Thus, decision trees are capable of solving Data Mining tasks that lack a priori information.

The quality of the classification model constructed using the decision tree was characterized by two main features: the accuracy of recognition and error: the accuracy of recognition was calculated as the ratio of objects correctly classified in the study process to the total number of data set objects that participated in the study; the error was calculated as the ratio of objects that are incorrectly classified in the study process to the total number of data set objects that participated in the study. There are different criteria for nutrition. The most known are the degree of entropy (informativity) and the Gini index. The last splitting criterion was implemented in this work in the CART algorithm, and its use of the attribute was chosen based on the distances between class distributions. The CART algorithm was designed to construct a binary decision tree. Each node of a binary tree, when split, had only two descendants, which were called subsidiary branches. Further division of the branch depended on whether many of the output data described this branch. At each step of building a tree, the rule that was formed at the node, distributed the set of examples to two parts. The part on the right is the part of the plural in which the rule was executed; the part on the left is the part of the set for which the rule was not executed.

The accuracy of the classification in the derived classification tree was 87.8 %. This relation of accuracy of the classification showed good model adequacy, though, it was less than in the method of discriminant analysis.

On the basis of the revealed methods of discriminant analysis and classification trees, the indicators of the most significant for prediction for quality of life, the quality of life for patients with complicated forms of chronic pancreatitis, depending on the method of surgical treatment of patients (type 1 - resection interventions, type 2 - resection interventions with drainage, including own modifications, type 3 - drainage operations, type 4 - symptomatic operations). Thus, good results of treatment were observed in 31.3 % of patients, of which 21.74 % were patients with resection medications with drainage, 5.22 % - patients with drainage types of operations, 3.48 % - patients with symptomatic operations. Satisfactory results of surgical treatment were observed in 46.96 % of patients, of which 10.43 % were patients with drainage and 24.35 % of patients with symptomatic operations. Unsuccessful results of surgical treatment were observed in 21.74 % of patients, of which 7.83 % were patients with drainage operations and 11.3 % were patients with symptomatic operations. Unsatisfactory results of surgical treatment in patients with drainage and symptomatic operations were due to the fact that a part of fibrous tissue remained and persistent pain syndrome was temporarily eliminated, the progression of chronic pancreatitis continued. Therefore, these patients were re-hospitalized for therapeutic and surgical hospitals. In the remote postoperative period, 17 patients were re-hospitalized. Reasons for re-hospitalization were persistent pain syndrome, dyspepsia syndrome, due to continued use of alcohol by patients and refusal to receive enzyme preparations for "substitution" therapy.

As numerical experiments have indicated, mathematical models for determining the quality of life, which are based on a linear combination of these indicators, have not shown satisfactory accuracy

for classification. Therefore, nonlinear models were considered. However, in this case, the use of scoring points given in accordance with the instruction for processing data obtained with the help of the SF-36 questionnaire was inappropriate. Thus, in some cases, the zero values of one of the indicators led to an unjustified lack of influence of other indicators. Therefore, in nonlinear models it was more expedient to use the "raw" points of the SF-36 questionnaire. Given the nature of the changes in these indicators, depending on the quality of life, one could assume a simple nonlinear mathematical model for assessing the quality of life. It was to calculate the "criterion" of quality of life by the formula (2):

Criterion of quality of life = role functional x mental health / dyspepsia syndrome (2)

The coincidence of the calculated values of the quality of life criterion with the real data (115 patients) showed good overall accuracy - 87 %.

Conclusions. Thus, in assessing the quality of life in the proposed mathematical model, we obtained the following results: after resection operations, 11.1 % of patients received good results, 77.8 % were satisfactory and 11.2 % were unsatisfactory; after duodenoprotective operations in various modifications, good results were obtained in 79.5 %, satisfactory - 20.6 %, unsatisfactory- 5.9 %; after drainage operations, good results were obtained at 22.2 %, satisfactory - 44.5 %, unsatisfactory - 33.3 %; after symptomatic operations, good results were obtained at 8.9 %, satisfactory - 62.2 % and unsatisfactory - 28.9 % in the period from 1 to 7 years after the operation.

REFERENCES

1. Бергер А. Microsoft SQL Server 2005 Analysis Services. OLAP и многомерный анализ данных / А. Бергер. / Серия: В подлиннике. БХВ-Петербург, 2007. – 928 с.

2. Ветшев П. С. Изучение качества жизни пациентов после хирургического лечения / П. С. Ветшев, Н. Н. Крылов, Ф. А. Шпаченко // Хирургия. – 2000. – № 1. – С. 64–66.

3. Губергриц Н. Б. Клиническая панкреатология / Н. Б. Губергриц, Т. Н. Христич. – Донецк : ООО «Лебедь», 2000. – 416 с.

4. Данилов М. В. Рецидивирующий панкреатит как хирургическая проблема / М. В. Данилов // Актуальные вопросы абдоминальной хирургии : науч.-практ. конф., г. Ташкент : материалы конф. – Ташкент, 2004. – С. 26–27.

5. Махов В. М. Этиологические аспекты диагностики и лечения хронического панкреатита / В. М. Махов // Рос. мед. журн. – 2002. – № 2. – С. 3–8.

6. Пальцев А. И. Хронический панкреатит: этиология, патогенез, клиника, лечение (ч. I) / А. И. Пальцев, А. А. Еремина // Врачебные ведомости. – 2002. – № 1. – С. 28–32.

7. Морозов С. В. Профилактика послеоперационного панкреатита при резекциях поджелудочной железы / С. В. Морозов // Анналы хирургической гепатологии. – 2008. – Т. 13, № 3. – С. 63–64.

8. Quality of life in patients with chronic pancreatitis / R. Pezzilli, A. M. Morselli Labate, R. Ceciliato [et al.] // Dig. Liver. Dis. – 2005. – Vol. 37, № 3. – P. 181–189.

9. The quality of life in patients with chronic pancreatitis evaluated using the SF-12 questionnaire: a comparative study with the SF-36 questionnaire / R. Pezzilli, A. M. Morselli Labate, L. Fruiioni [et al.] // Dig. Liver. Dis. – 2006. – Vol. 38, № 2. – P. 116–118.

10. Wehler M. Ilealth-related quality of life in chronic pancreatitis: a psychometric assessment / M. Wehler, U. Reulbach, R. Nichterlein // Scand. J. Gastroenterol. – 2003. – Vol. 38, № 10. – P. 1083–1089.