

Study on the Clinical Effect of Chinese and Western Medicine Combination Based on Text Mining Technology in the Treatment of Ascites due to Liver Cirrhosis

Tan Fei, Yang Ying, Yang Xinzheng, Zhao Ling, Yang Linyuan

Xi 'an Medical College Xi 'an 710309, China

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Abstract: Purpose: To explore the combined treatment of Western medicine and Chinese patent medicine for cirrhotic ascites by text mining technology and observe its clinical efficacy. Methods: Medical literature on combined treatment of TCM and WM for liver cirrhosis from 2009 to 2019 in CNKI was retrieved and relevant bibliographic titles were downloaded. Data were processed by SQL. After artificial noise reduction, the medication rule of TCM and WM for treatment of age-related cirrhosis ascites was analyzed. The relationship text of liver cirrhosis nursing in Netdraw format was generated and Netdraw network graph was constructed. Results: A total of 6150 literatures related to the combination of traditional Chinese and Western medicine in the treatment of liver cirrhosis were retrieved. After analysis, 15 Keywords were obtained, which are upper gastrointestinal hemorrhage, ascites, portal hypertension, nursing intervention, hepatic encephalopathy, psychological nursing, gastrointestinal hemorrhage, triple lumen and double balloon catheter, quality of life, absolute bed rest, decompensation period, clinical nursing, complications, eating less and eating more, and health education. Conclusion: Using the method of text mining, the regularity of western medicine and Chinese patent medicine in treating ascites due to liver cirrhosis is presented from the frequency of literature reports, especially the combined application of western medicine and Chinese patent medicine is worth further research.

1. Introduction

Text mining is to extract meaningful data from unstructured text data. Text mining can be applied to biology and medicine, which can be divided into five steps: text data collection, processing, structured analysis, visualization and evaluation [1]. Cirrhotic ascites is a chronic, progressive and diffuse lesion caused by long-term action of various causes on the liver. Widespread necrosis of hepatocytes, regenerative nodules of residual hepatocytes, proliferation and fibrosis of connective tissue were observed in these patients, which severely damaged the normal liver structure and formed pseudolobules [2]. Hepatic ascites is the most common and earliest complication of the above-mentioned complications. It is a major sign of the development of liver disease to late stage, and it is difficult to treat. According to relevant data, although western medicine has certain effect in the treatment of ascites due to liver cirrhosis, adverse reactions occur frequently and relapse easily [3]. In this paper, Chinese and western medicines are used to treat patients with cirrhosis ascites, which can significantly improve the liver function index of patients. By using text mining technology, this paper makes a systematic analysis of the research literatures on the combined treatment of Chinese and western medicine for liver cirrhosis in the past 10 years, so as to understand the research situation in this field, identify the research hotspots, and help to improve the nursing level. The details are as follows.

2. Data and Methods

2.1 Literature source

Login to CN—KI (China National Knowledge Network) China Journal Full-text Database

(CN-KI). Under advanced retrieval, the Keywords “liver cirrhosis” and “combined treatment of Chinese and western medicine” are used as retrieval forms. After searching, 6,150 articles were obtained by merging the search subject words with the item words, subject words and the number of hit articles. In order to see the flow number, title, Abstract, subject words and other information of each document, select “detailed” and “display all” in the display format. The time limit is January 2009 to September 2019, and the retrieval date is October 2019.

2.2 Document processing

Download and obtain all relevant literature titles, apply regular expressions to extract keywords of all documents through text extraction tool Regex Buddy; import the extracted information into self-editing software, generate netdraw format cirrhosis care relationship text, and construct netdraw Network Diagram. No. 0261882, registration number 2010SR073409) extracts the downloaded unstructured text data and saves it into a format that is convenient for database Access and Microsoft SQL Server. The information extracted from the data set is mainly machine-marked keywords (including core and non-core types, hereinafter referred to as keywords). The keyword information is first stored in Access database as the material for the next data processing, and then imported into SQL for the next mining analysis.

2.3 Text mining and analysis

The Keywords appearing in the same article partly reflect the information of the whole article, and the relevant Keywords have the feature of “appearing together”. And as far as a specific document is concerned, there is the basic fact of “co-occurrence” among relevant keywords. This co-occurrence is not random, but contains certain significance. Especially for high frequency keyword pairs, it reflects the importance of scientific researchers to a certain extent. These keyword pairs can be used as the main material for text mining. More importantly, for the current text mining technology, the Keywords that appear in collaboration are very good mining and analysis materials.

3. Result

3.1 Search results

A total of 6150 literatures related to the treatment of liver cirrhosis with Chinese and Western medicine were obtained. There are 155 kinds of Western medicines obtained by data mining. In Table 3, Western medicines with literature frequency (> 6) are selected. The indexes of liver function were slightly abnormal or returned to normal, and the clinical symptoms disappeared; the indexes of spleen thickness and portal vein width were significantly reduced by B-mode ultrasonography; effective: the indexes of liver function were reduced by more than 50% and ascites by more than 50%. On the basis of the above-mentioned western medicine treatment, the patients were treated with traditional Chinese medicine of activating blood circulation and removing blood stasis. The specific prescription composition is as follows: seeding of virgate wormwood 30g, poria cocos15g, americanwater plantain10g, atracylodes10g, salvia10g, polyporus10g, Cinnamon Twig6g, rhubarb10g, peach kernel10g, Reduced glutathione, glycyrrhizic acid inhibitor, spironolactone, furosemide and other conventional western medicine drugs were used for treatment, and the treatment was planned for 2 weeks. The main symptoms were completely disappeared or greatly improved. The degree of hepatosplenomegaly remained stable without obvious knocking pain and tenderness. The ascites volume decreased by more than 50%, not completely disappeared, and the liver function index decreased by more than 50%. The frequency of androgen and immunomodulator is the highest, which indicates that clinical workers pay more attention to these two drugs in AA treatment and their application is wide.

3.2 Keywords

After text mining, a total of 15 core keywords were obtained, namely upper gastrointestinal hemorrhage, ascites, portal hypertension, nursing intervention, hepatic encephalopathy, psychological care, gastrointestinal hemorrhage, triple lumen and double balloon catheter, quality of

life, absolute bed rest, decompensation, clinical nursing, complications, eating less and eating more, and health education. See Table 1 for the number of relevant documents.

Table 1 Keywords

| Keywords | Number of documents | Keywords | Number of documents |
|---------------------------------|---------------------|---|---------------------|
| Upper gastrointestinal bleeding | 963 | Quality of life | 158 |
| Ascites | 256 | Absolute bed rest | 179 |
| Portal hypertension | 452 | Decompensation period | 150 |
| Nursing intervention | 284 | Clinical nursing | 122 |
| Hepatic encephalopathy | 364 | Complication | 134 |
| Psychological nursing | 195 | have more meals a day but less food at each | 107 |
| Gastrointestinal bleeding | 332 | Health education | 97 |
| Three-chamber two-balloon tube | 299 | | |

According to the conventional fields in the TCM inspection data, including the correction and standardization of the inspection data. It is mainly to correct the ambiguous or ambiguous data. Clinicians are mainly responsible for manual screening and correction. The text mining prediction model is shown in Figure 1. The legend is drawn by Visio, and the bottom layer is the input layer, that is, the constructed feature matrix, totaling 140 dimensions; the top layer is the output layer, corresponding to the diagnostic results, totaling 2 dimensions, which represents whether the results of liver cirrhosis examination are negative or positive (with or without cirrhosis).

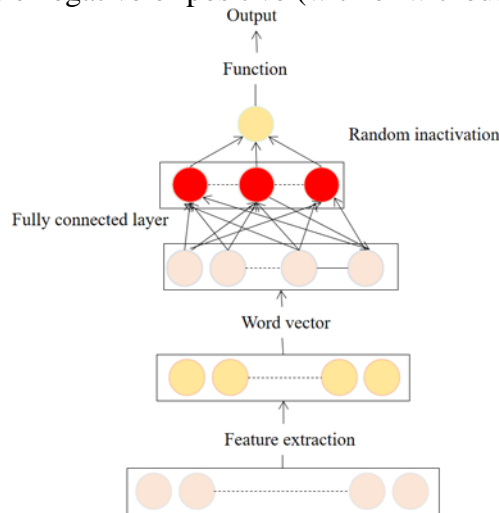


Figure 1 Text mining prediction model

The prediction results of text mining are shown in Table 2 and Table 3. The two tables are the results of 200 iterations and 800 iterations respectively. In addition, the training and test data are predicted in different proportions. The results show that the accuracy of prediction results can reach 85% by using the method used in this study, and the ratio of training data to test data is 7:4.

Table 2 Prediction results (200 iterations)

| Total data (bar) | Training data (bar) | Test data (bar) | Accuracy (%) |
|------------------|---------------------|-----------------|--------------|
| 1000 | 389 | 663 | 78.69 |
| 1000 | 810 | 712 | 77.32 |

Table 3 Prediction results (800 iterations)

| Total data (bar) | Training data (bar) | Test data (bar) | Accuracy (%) |
|------------------|---------------------|-----------------|--------------|
| 1000 | 389 | 663 | 73.28 |
| 1000 | 810 | 712 | 79.05 |

4. Discussion

Text mining is the process of obtaining users' interesting or useful patterns from unstructured text information. Based on text mining technology, it can help people dig out the target data needed by the research from the vast amount of literature and provide objective basis for the research in related fields [4]. The clinical symptoms of ascites due to liver cirrhosis are mainly abdominal swelling, abdominal distension and abdominal circumference enlargement. Other manifestations of liver cirrhosis are often accompanied, such as fatigue, anorexia, jaundice, liver discomfort, epistaxis, gingival hemorrhage, lower limb edema, etc. Some patients may have pleural effusion. Traditional medicine believes that ascites due to liver cirrhosis belongs to the category of distention, which is characterized by dysfunction of kidney, spleen and liver, blood stasis and qi stagnation, water stagnation in the abdomen, and pathogenesis characterized by deficiency and excess [5]. Liver cirrhosis ascites is a common disease caused by hepatitis, and treatment programs are mostly combined with traditional Chinese and western medicine. Diuretics, ascites concentration and recovery, increasing plasma colloid osmotic pressure and abdominal-jugular drainage are commonly used for the treatment of this disease. However, there are still no effective treatment schemes in many methods [6]. The text of TCM has the characteristics of strong structure, so it is very suitable to introduce regular expression as a tool in TCM literature research. At the same time, due to the need for manual screening, regularization and standardization in the data preprocessing process, it may cause abnormal or erroneous data and other problems, thus causing problems in the overall data quality. In this study, 6150 literatures were collected to explore the rule of traditional Chinese medicine and Western medicine in the treatment of ascites due to liver cirrhosis, which can reflect the actual situation of clinical medication.

Traditional medicine believes that ascites due to liver cirrhosis belongs to the category of swelling and swelling. The pathogenesis is mostly related to jaundice accumulation, emotion, diet, etc. Treatment should focus on eliminating excess and supplementing deficiency, adjusting protein ratio, improving albumin, and enhancing the immune function of patients [7]. Through data mining, this study shows that upper gastrointestinal hemorrhage is the most important field in liver cirrhosis nursing research in the past 10 years. Clinically, upper gastrointestinal hemorrhage is also the most common complication of liver cirrhosis, which has the characteristics of acute onset, severe illness, rapid changes, etc. When there is a large amount of ascites, oppression symptoms such as chest tightness, palpitation and dyspnea may occur. In the view of traditional Chinese medicine, the formation of this disease is mainly due to improper drinking and eating, emotional injury, schistosomiasis infection, and other disease changes. As the liver, spleen, and kidney are affected, qi, blood, and water stasis accumulate in the abdomen, causing the abdomen to swell and swell day by day [8]. Studies have shown that compound saponin pills have obvious therapeutic effects on hematopoietic cell damage and hematopoietic cell disorders, and also have the effect of improving immune function, and have obvious regulation and promotion of hematopoietic function. The mechanism is due to the portal hypertension caused by cirrhosis, which causes the portal vein to shunt to the fundus vein. The established collateral circulation causes the fundus and esophageal varices. Therefore, the treatment mainly relies on soothing the liver and relieving stagnation, qi and water, clearing away heat and dampness, promoting blood circulation and removing blood stasis, nourishing liver and kidney as the method, so that the patient's blood and blood can be reconciled, and the liver, spleen and kidney function become normal [9].

Nursing of ascites due to liver cirrhosis is also quite important. Ascites is mostly caused by the combined action of various pathogenic factors such as obstruction of gastrointestinal venous blood reflux caused by portal hypertension after liver diseases lead to liver fibrosis and cirrhosis. In

addition, when Chinese patent medicine and western medicine are used together clinically, most of the literatures report that they can play a synergistic role, and the combined effect is better than that of the single use. However, reports on the rationality, how to combine, the mechanism of their combined effect, and whether there are potential risks are rare [10]. In addition to active and correct treatment, effective nursing, such as psychological intervention, life guidance, health education and so on, can also prevent the further deterioration of liver disease to a certain extent. The treatment of ascites due to cirrhosis with integrated traditional Chinese and Western medicine has a remarkable effect. It can effectively reduce the recurrence rate and related complications, and reduce the damage to the body of patients. The treatment of ascites due to cirrhosis with TCM syndrome differentiation combined with western medicine is worth promoting. Tracing back to the original article, we found that different clinical conditions of combined drug use are different. However, few reports have been reported on how to combine, the rationality of joint use, the mechanism of joint action, and the potential risks.

5. Conclusion

In short, the use of text mining technology can simplify the study of literature and greatly reduce the workload of literature research. Its new discovery expands the scope and thinking of clinical medication, provides objective basis for scientific and rational use of Chinese patent medicine and Western medicine, and provides reference for clinicians. This study found 19 main hotspots and fields in the current nursing research of liver cirrhosis, so as to understand the research situation and development trend of liver cirrhosis nursing as a whole, and make the future research more clear. For cirrhotic ascites patients, the use of Chinese and western medicine can effectively improve their liver function, reduce the width of portal vein and reduce the thickness of liver and spleen, and the curative effect is significantly higher than that of western medicine alone. Since there are different levels of document quality and keyword design, it is still necessary to trace the source of the document to make a comprehensive judgment on the obtained results so as to reduce noise. Therefore, it is the next requirement for text mining technology to refine and upgrade working procedures, improve automatic analysis capability, and further reduce noise and labor workload.

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