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The Impact of Psychological Care on Preoperative Anxiety and Postoperative Pain in Patients Undergoing Liver Biopsy

Fang Cheng, Xiaoyu Wang, Menglan Tan, Min Hu, Yanfang Luo

Shenzhen Hospital of Peking University, Shenzhen 518036, Guangdong, China

Abstract: *Objective*: To explore the impact of psychological care on preoperative anxiety and postoperative pain in patients undergoing liver biopsy. *Methods*: A total of 100 patients undergoing liver biopsy in our hospital from January 2024 to October 2024 were selected as the study subjects. They were divided into a control group and a study group using a random number table method, with 50 patients in each group. The control group received routine care, while the study group received psychological care on the basis of the control group's treatment. The nursing satisfaction, fear scores, anxiety scores, postoperative pain levels, and incidence of complications (local pain at the puncture site, bleeding at the puncture site, skin irritation, tension blisters, infection, severe abdominal pain, pneumothorax) were compared between the two groups. *Results*: The nursing satisfaction in the study group was higher than that in the control group ($P < 0.05$). After nursing, the fear scores and anxiety scores in both groups were lower than before nursing, and the fear scores and anxiety scores in the study group were lower than those in the control group ($P < 0.05$). The postoperative pain scores in the study group were lower than those in the control group ($P < 0.05$), and the incidence of complications in the study group was lower than that in the control group ($P < 0.05$). *Conclusion*: The application of psychological care in patients undergoing liver biopsy has a definite effect, which can improve patient satisfaction, reduce preoperative anxiety and fear, alleviate postoperative pain, and reduce the incidence of postoperative complications. It is worthy of clinical promotion and application.

Keywords: Psychological care; Liver biopsy; Anxiety; Pain

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1. Introduction

Liver biopsy is an important method for diagnosing liver diseases, primarily involving the use of a needle to obtain a small amount of liver tissue from patients for pathological examination. Due to incomplete understanding of this method, patients may easily develop negative emotions before surgery, affecting the surgical outcome [1, 2]. Additionally, as liver biopsy is invasive, complications such as bleeding and infection may occur during or

after the procedure, further exacerbating patients' negative emotions. Therefore, timely and effective nursing intervention should be implemented before liver biopsy to ensure its diagnostic and therapeutic efficacy. Ignoring patients' emotional state and sleep quality fails to meet their multifaceted needs [3]. In view of this, the present study selected 100 patients undergoing liver biopsy in the hospital from January 2024 to October 2024 as the study subjects to investigate the impact of psychological care on preoperative anxiety and postoperative pain in these patients. The results are reported below.

2. Materials and methods

2.1. General information

A total of 100 patients undergoing liver biopsy in the hospital from January 2024 to October 2024 are selected as the study subjects. They are divided into a control group and a study group using a random number table method, with 50 patients in each group. In the control group, there are 33 males and 17 females, aged between 21 and 59 years, with an average age of (40.85 ± 9.85) years. The duration of disease ranged from 1 to 10 months, with an average of (5.02 ± 0.36) months. Among them, 33 cases had viral hepatitis, 10 cases had immune hepatitis, and 7 cases had unexplained liver injury. In the study group, there are 30 males and 20 females, aged between 21 and 59 years, with an average age of (40.45 ± 9.76) years. The duration of disease ranged from 1 to 11 months, with an average of (5.21 ± 0.41) months. Among them, 32 cases had viral hepatitis, 10 cases had immune hepatitis, and 8 cases had unexplained liver injury. There were no statistically significant differences in general characteristics between the two groups ($P > 0.05$). All patients provided complete informed consent and signed informed consent forms for this study. The study is approved by the hospital's medical ethics committee.

2.2. Inclusion and exclusion criteria

2.2.1. Inclusion criteria

(1) Clarification of the cause of abnormal liver function (suspected drug-induced, autoimmune, genetic metabolic, alcoholic/non-alcoholic liver dysfunction, etc.), presence of liver fibrosis, and clinical conditions of liver cirrhosis.

(2) Selection of antiviral timing, efficacy evaluation, and prognosis judgment for patients with chronic hepatitis B.

(3) Diagnosis of acute/chronic rejection or infection and other severe complications after liver transplantation through liver biopsy [4].

2.2.2. Exclusion criteria

(1) Coma or inability to cooperate due to other diseases.

(2) Obvious bleeding tendency, coagulation dysfunction, severe thrombocytopenia.

(3) Extrahepatic obstructive jaundice, infection at the puncture site.

(4) Hepatic hemangioma.

(5) Large amounts of refractory ascites.

(6) Pregnancy.

2.3. Methods

2.3.1. Puncture method

Both groups of patients lay on their backs on the operating table. Ultrasound scanning is used to assess the skin, subcutaneous tissue, and organ conditions in the puncture area. Appropriate puncture sites, angles, and depths are selected. The skin is disinfected, and local anesthesia is administered. A disposable puncture needle (16G) from Foshan Special Medical Catheter Co., Ltd.'s Shubekang puncture kit is used to puncture into the liver. A small amount of liver tissue is collected using a biopsy gun. The needle is withdrawn, and the local puncture site is compressed and bandaged. The liver condition is rechecked using ultrasound. The liver tissue samples are preserved in formaldehyde solution and sent for histopathological diagnosis in a timely manner.

2.3.2. Control group

Routine nursing care is provided, which mainly included:

(1) Preoperative measurement of patients' vital signs, completion of blood routine and coagulation function tests. Simultaneously, preparation of surgical safety checklists and medications. Instruction to patients on the use of liver-protecting drugs as prescribed, advice on adequate rest and a bland diet, and a brief explanation of relevant matters related to liver biopsy.

(2) Postoperative electrocardiographic monitoring for 6 hours, local compression with a salt bag for 6 hours, bed rest for 12 hours, abdominal bandaging with pressure for 24 hours, observation of pain at the puncture site, bleeding from the dressing, and occurrence of postoperative complications as prescribed.

2.3.3. Research group

Psychological care is added to the control group's regimen. The main contents include:

(1) Medical history collection: Nursing staff comprehensively grasp the patient's medical history, education level, cognitive level, psychological status, mental state, and other relevant information beforehand. A postoperative psychological care plan is then formulated based on the patient's basic conditions, such as medical history.

(2) Psychological communication: Actively communicate and interact with patients to correctly understand their current psychological state and provide targeted guidance. Nursing staff utilize medical communication and peer patient testimonials to reduce the occurrence of negative emotions in patients. Additionally, patients are guided in preoperative deep breathing and breath-holding exercises.

(3) Health education: Due to patients' lack of knowledge about liver biopsy procedures and nursing measures, they may easily worry about the surgery. Nursing staff inform patients about the biopsy method, nursing measures, and postoperative complications beforehand, allowing them to prepare psychologically. Communication with patients' families is also strengthened, encouraging them to participate in related nursing work and provide more comfort and care to reduce negative emotions.

(4) Rehabilitation intervention: (a) Based on the patient's recovery, nursing staff develop a standardized rehabilitation training program to gradually restore normal physical function and activity. Training can start with bed rest and limb movements, gradually progressing to rolling over on the operative side, sitting up, and standing and walking to avoid prolonged bed rest; (b) Observe the patient's wound condition during each shift, checking for bleeding, infection, etc., and perform timely wound cleaning and dressing changes if necessary. Guide patients on proper skin cleansing and bathing techniques to avoid infection

at the puncture site. Provide necessary safety protection measures such as bed rails and placing daily items and call bells within easy reach to prevent falls or bed exits; (c) Develop a postoperative follow-up plan, instructing patients to avoid strenuous activities like twisting and heavy lifting for one month after discharge. Regularly communicate with patients through a cloud-based follow-up platform to understand their recovery progress, answer questions, and provide necessary guidance to promote physical rehabilitation.

2.4. Observation indicators

(1) Compare and observe nursing satisfaction between the two groups, evaluated using the Newcastle Satisfaction with Nursing Scales (NSNS) with a total score of 100. Where very satisfied ≥ 85, satisfied 60–85, and dissatisfied < 60. Nursing satisfaction = (very satisfied + satisfied) cases / total cases × 100% [5].

(2) Compare and observe psychological changes before and after nursing in both groups, assessed using the SCL90 self-rating scale. Evaluation criteria range from 0–5 for indicators, including fear and anxiety. Scores are assigned as 5 (severe), 4 (relatively severe), 3 (moderate), 2 (mild), and 1 (none). Objectively monitor patients' fear and anxiety scores before and after implementing the nursing plan [6].

(3) Compare the degree of liver pain between the two groups at 24h, 48h, and 72h postoperatively, assessed using the SF-MPQ [7]. The scale includes 4 affective and 11 sensory items, scored from 0-3 (none, mild, moderate, severe) for a total of 45 points. The score is positively correlated with the degree of pain.

(4) Compare the incidence of complications between the two groups, including local pain at the puncture site, bleeding at the puncture site, skin irritation, tension blisters, infection, severe abdominal pain, and pneumothorax.

2.5. Statistical analysis

Data analysis is performed using SPSS 17.0 software. Measurement data are expressed as mean ± standard deviation and compared between groups or within groups using the t-test. Count data are expressed as n (%) and compared using the chi-square test. A P-value < 0.05 is considered statistically significant.

3. Results

3.1. Comparison of nursing satisfaction between the two groups

Nursing satisfaction in the research group was higher than that in the control group, with a statistically significant difference ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of nursing satisfaction between the two groups [n(%)]

Group	Cases	Very satisfied	Satisfied	Dissatisfied	Total satisfaction
Control group	50	16(32.00)	27(54.00)	7(14.00)	43(86.00)
Study group	50	20(40.00)	29(58.00)	1(2.00)	49(98.00)
$\chi 2$ value	/	/	/	/	8.698
P value	/	/	/	/	0.000

3.2. Comparison of psychological changes

After nursing intervention, both groups showed lower scores for fear and anxiety compared to before nursing, and the study group had significantly lower scores for fear and anxiety than the control group. The difference was statistically significant ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of psychological changes ($\bar{x} \pm s$, points)

Group	Cases	Fear		Anxiety	
		Before care	After care	Before care	After care
Control group	50	4.15 ± 0.78	2.76 ± 1.05*	3.62 ± 0.96	2.88 ± 0.69*
Study group	50	4.11 ± 0.83	1.21 ± 0.86*	3.71 ± 1.03	1.96 ± 0.48*
t value	/	0.233	5.835	0.085	4.452
P value	/	0.815	0.000	0.932	0.000

Note: Compared with before nursing in the same group, *$P < 0.05$.

3.3. Comparison of pain levels

The postoperative pain scores in the study group were lower than those in the control group, and the difference was statistically significant ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of pain levels ($\bar{x} \pm s$, points)

Group	Cases	24h Post-op	48h Post-op	72h Post-op
Control group	50	4.14 ± 1.06	3.02 ± 0.48	1.28 ± 0.35
Study group	50	3.47 ± 0.85	1.26 ± 0.31	0.41 ± 0.17
t value	/	3.016	19.759	13.355
P value	/	0.004	0.000	0.000

3.4. Comparison of incidence of complications

The incidence of complications in the study group was lower than that in the control group, and the difference was statistically significant ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of incidence of complications [n(%)]

Group	Cases	Puncture site pain	Puncture site bleeding	Skin allergy	Tension blisters	Severe abdominal pain	Incidence rate
Control group	50	2(4.00)	1(2.00)	1(2.00)	2(4.00)	1(2.00)	7(14.00)
Study group	50	1(2.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(2.00)
$\chi 2$ value	/	/	/	/	/	/	15.236
P value	/	/	/	/	/	/	0.000

4. Discussion

In recent years, with the continuous development of medical technology, updates in imaging equipment, and

improvements in operational skills, liver biopsy has been widely used. It allows for direct observation of morphological changes in liver diseases. Due to the diverse types of liver diseases and complex etiologies and pathogenesis, liver biopsy plays an effective role in clarifying the pathology of diseases and provides scientific evidence for clinicians [8]. However, this procedure can cause some degree of concern for patients before surgery, and the potential for postoperative complications, as informed by medical staff, can directly affect patients' psychological states, leading to increased fear and anxiety. Therefore, it is crucial to incorporate nursing interventions before and after liver biopsy. Basic nursing interventions, such as monitoring vital signs and observing the patient's condition, are routine practices that may not effectively improve patients' psychological status when applied to liver biopsy. Incorporating psychological nursing into the care plan can provide targeted nursing support. Through psychological nursing, preoperative and postoperative communication and education can enhance patients' awareness and cooperation regarding liver biopsy, enabling them to approach the procedure and postoperative care with a positive attitude, thereby reducing preoperative anxiety and postoperative pain.

The results of this study showed that the nursing satisfaction of the research group was higher than that of the control group ($P < 0.05$). After nursing, the fear and anxiety scores of both groups were lower than before nursing, and the fear and anxiety scores of the research group were lower than those of the control group ($P < 0.05$). The postoperative pain score of the research group was lower than that of the control group ($P < 0.05$), and the incidence of complications in the research group was lower than that in the control group ($P < 0.05$). These results indicate that psychological nursing is more effective than routine nursing for patients undergoing liver biopsy. According to the analysis, the health knowledge education in psychological nursing helps to increase patients' understanding of liver biopsy-related information, improve acceptance, and reduce negative emotions. Psychological communication can alleviate fear and anxiety by listening to patients' concerns and communicating with patients with similar illnesses, making patients feel relaxed and relieved. In addition, psychological nursing can improve patients' cooperation, making liver biopsy more smooth and promoting patients' recovery and reducing discomfort during the recovery process. It can ensure that patients get adequate rest during the perioperative period, thus maintaining emotional and physiological stability during the operation and reducing the risk of puncture. Postoperative rehabilitation intervention can provide appropriate care and guidance, promote early ambulation, and better manage patients' postoperative rehabilitation process [9]. Therefore, the advantage of psychological nursing lies in focusing on patients' overall health, especially mental health, and providing more support and personalized care. This personalized nursing method can adjust patients' emotional state, reduce pain, and improve the quality of nursing [10]. This personalized nursing approach can increase patients' confidence in preoperative puncture and accelerate postoperative recovery.

5. Conclusion

In conclusion, psychological nursing has demonstrated effective results in patients undergoing liver biopsy. It improves patient satisfaction, reduces preoperative anxiety and fear, alleviates postoperative pain, and decreases the incidence of complications. Therefore, it is worthy of clinical promotion and application.

Disclosure statement

The authors declare no conflict of interest.

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