

The effect of TNA support to the patients with liver function discompensation which after hepatectomy in encircles the surgery time

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ABSTRACT: OBJECTIVE The discussion encircles the surgery time liver leaf to excise the patient liver function discompensation to carry on the nutrition support the characteristic, Analysis the TNA support effect. **METHODS** Encircles the surgery time liver function to 8 examples discompensation patient's nutrition condition, the nutrition support method and the effect carries on the review analysis. **RESULTS** In front of this group of 8 examples patient technique TNA support, also 8 examples get sick average per person smoothly passed the surgery time. In front of 8 examples patients technique has the varying degree the malnutrition, liver function barrier, the immunity is somewhat low, in front of after the technique the nutrition supports 5 day to have the distinct improvement ($*P < 0.05$, $**P < 0.05$); in the technique has the blood sugar undulation, the electrolyte disorder; after the technique appears the liver function a series of discompensation illness complication to refer drafts: the CHE is low, ALT, AST, GGT and the TB excessively are high, the TP and the A/G are low, at the same time appears the low K^+ blood sickness, the low Na^+ blood sickness, the high glycemia, the low proteinemia and so on. After the technique the nutrition supports 10 day, the above symptoms all have the remarkable improvement ($**P < 0.05$), patients weight gain. **CONCLUSION** The suitable nutrition supports to encircles the surgery time liver function discompensation liver leaf to excise the patient to be restored to health the vital role.

KEY WORDS: the TNA support; hepatectomy; liver function discompensation; excision to be restored to health

肝叶切除术后肝功能失代偿病人的营养支持

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摘要: **目的** 探讨围手术期肝叶切除病人肝功能失代偿进行营养支持的特点, 分析营养支持的效果。 **方法** 对 8 例围手术期肝功能失代偿病人的营养状况、营养支持方法和效果进行回顾性分析。 **结果** 本组 8 例病人术前均行营养支持, 且 8 例病人均顺利度过手术期。 8 例病人术前存在不同程度的营养不良, 肝功能障碍, 免疫力偏低, 术前营养支持 5d 后有明显改善 ($*P < 0.05$, $**P < 0.05$); 术中发生血糖波动、电解质紊乱; 术后出现肝功能失代偿并发症的一系列指征: 胆碱酯酶过低、ALT, AST, GGT 及总胆红素过高、总蛋白及血清蛋白/球蛋白比值过低, 同时出现低钾血症、低钠血症、高血糖症、低蛋白血症等。术后营养支持 10d, 上述症状都得到显著改善 ($**P < 0.05$), 病人体重增加。 **结论** 适当的营养支持对围手术期肝功能失代偿肝叶切除病人的康复起重要作用。

关键词: 肠外全营养混合液营养支持; 肝叶切除; 肝功能失代偿; 康复

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The liver function discompensation, so that liver function failure, after is the liver leaf excision method the most important illness complication, also after causes the primary factor which the patient technique died. After the liver leaf excises the patient technique if has the liver function discompensation, then can continue sends the malnutrition, metabolism barrier and so on each kind of illness complication, encircles the surgery time to give the positive nutrition support, corrects patient's malnutrition and metabolism barrier, is the liver function loses in the commutation time an important treatment method. My courtyard develops the city sanitation bureau scientific research from 2003 to 2005 to set up the item "total nutrient abmixture (TNA) to encircle the surgery time liver leaf to excise patient's curative effect analysis", had 8 examples patients to have the liver function dis-

compensation, Presently reports as follows.

1 Material and the method

1.1 Case of illness selected principle

This experiment patients are selected the standard as follows: (1) between 30 ~ 70 year old patient; (2) has completed the integrity medical history inquiry and the medical examination; (3) clinically has the line of liver leaf excision to refer drafts; (4) liver function: The CHE is low; ALT, A ST, GGT and the TB have the varying degree elevating; TP and A/G is low. Removes the standard as follows: (1) is pregnant or the breast-feeding period woman; (2) has the serious other chronic medical history formerly, Like primary hypertension, coronary disease, pulmonary tuberculosis, kidney function not entire and so on; (3) has the allergic history to in the TNA formula medi-

cine; The laboratory technician at the experiment which before (4) starts 1month and experimental period participates in other any medicines; (5) is possible because the dysphrenia or other peculiar circumstance influences completes the laboratory technician.

1.2 Nutritions plans

Being selected patient gives the TNA support in the conventional treatment foundation which this experiment designs, in front of the technique supports at least 5 day, After technique nutrition support at least 10 days. The nitrogen quantity is 0. 25 ~0. 30 g/ (kg/d), (Sichuan ethics drugs manufacture limited company produces) by 5% 18kind of compound amino acids provides; non- protein quantity of heat according to 105 ~ 125kJ/ (kg/d), by glucose and center/Long chain fat emulsion (20 % Intralipid, the Guangzhou foreign national light drugs manufacture limited company produces) provides, the sugar: fat is 5 ~ 6: 4 ~5, Non- protein quantity of heat: the nitrogen is 100 ~ 120 kJ: 1 g. Moreover joins Shui Leweihe, Uyгурhe benefits, the And a America (manufactures drugs for the Chinese Switzerland limited company to produce) especially, The mannan peptide inoculation fluid (Suzhou Long March joyfultriumphant drugs manufacture limited company produces), the injection (Beijing double heron medicinal limited liability company produces) with the compound coenzyme, The thin iris sugar peptide inoculation fluid (Beijing match crudedrugs industry limited company produces); According to blood the glucose value adjustment sugar, the insulin ratio of: 3 ~8 kJ: 1 U; According to special details right amount electrolyte ingredient and so on supplement K⁺, Na⁺, calcium, chlorine, magnesium; Like the patient serum albumin

Tab 1 patient nutrition condition

表 1 病人营养状况

examination	no-nutrition support	the nutrition to support 5 days techniques	the first day technique	the nutrition support the 10 th
heavenly body (kg)	49. 02 ± 4. 84	50. 44 ± 4. 35 *	49. 25 ± 4. 78	50. 82 ± 4. 23 **
upper arms (cm)	22. 71 ± 3. 16	22. 92 ± 3. 95 *	22. 72 ± 3. 60	23. 10 ± 3. 24 **
HB(g/L)	103. 55 ± 9. 04	111. 21 ± 8. 35 *	97. 21 ± 11. 52	130. 31 ± 9. 85 **
ALB(g/L)	30. 71 ± 6. 54	31. 96 ± 4. 78 *	25. 83 ± 4. 22	32. 37 ± 4. 74 **

Note: Compares with the nutrition support before, * P<0. 05; First day compares after the technique, ** P<0. 05

注: 与营养支持前比较, * P<0. 05; 与术后第一天比较, ** P<0. 05

Tab 2 main liver function situations

表 2 主要肝功能情况

examination	no-nutrition support	the nutrition to support 5 days techniques	the first day technique	the nutrition support the 10 th
CHE(u/L)	3085. 24 ± 368. 88	4724. 57 ± 287. 32 *	1108. 56 ± 168. 54	4258. 61 ± 448. 81 **
ALT(u/L)	58. 10 ± 33. 32	40. 00 ± 27. 35 *	221. 57 ± 73. 53	38. 60 ± 10. 54 **
AST(u/L)	41. 14 ± 29. 65	35. 54 ± 20. 36 *	189. 37 ± 71. 52	36. 72 ± 15. 85 **
GGT(u/L)	150. 10 ± 67. 34	127. 83 ± 56. 42 *	176. 21 ± 66. 81	80. 31 ± 38. 52 **
TB(μmol/L)	39. 00 ± 10. 56	28. 20 ± 8. 45 *	47. 01 ± 10. 21	13. 10 ± 4. 65 **
TP(g/L)	53. 30 ± 4. 21	61. 84 ± 4. 83 *	34. 21 ± 8. 42	67. 33 ± 4. 54 **
A/G	1. 72 ± 0. 21	1. 99 ± 0. 19 *	0. 84 ± 0. 21	2. 14 ± 0. 22 **

Note: Compares with the nutrition support before, * P<0. 05; First day compares after the technique, ** P<0. 05

注: 与营养支持前比较, * P<0. 05; 与术后第一天比较, ** P<0. 05

is lower than 30 g/ L, Then other supplement human body albumin (10 ~ 20 g/ D).

1.3 Monitors contents

1.3.1 Nutritions targets: Including the body quality, the upper arm myo- encircle, HB), ALB.

1.3.2 Liver function: CHE, ALT, AST, GGT, TB, TP, A/G.

1.3.3 Electrolytes: K⁺, Na⁺.

1.3.4 Immunities targets: Lymphocyte.

1.3.5 Other observations contents: After technique illness complication (high glycemia, high Anxue sickness); after technique infection situation; After the technique the wound heals the situation.

1.3.6 Prognosestargets: Including mortality rate.

1.4 Statistical analyses

Use the SPSS710statistical analysis software package to carry on the statistical data the grouping to pair t to examine and to count the material chi 2examinations, obtains the P value with the precise probability law.

2 Results

2.1 Common clinical materials

This group of 8 examples patient male 3 examples, Feminine 5 examples, The age is the 32 ~ 68 year old. In front of the technique diagnoses 2 examples liver abscesses, 2 examples the bile duct chronic inflammation partner stone to form, 4 examples for the liver in for the primary liver cancer. 8 examples patients technique before had been taken nutrition support.

2.2 Use drugs period curative effect analyzes

2.2.1 8 examples patients to encircle the surgery time examination target.

Tab 3 electrolytes and other situation

表 3 电解质及其他情况

examination	no-nutrition	the nutrition to support	the first day	the nutrition
	support	5 days techniques	technique	support the 10 th
K ⁺ (mmol/L)	4.11 ± 0.72	4.32 ± 0.54 *	2.95 ± 0.41	4.10 ± 0.82 * *
Na ⁺ (mmol/L)	139.11 ± 11.21	141.35 ± 7.54 *	130.33 ± 18.22	137.24 ± 9.31 * *
LYMPH(10E9/L)	0.93 ± 0.41	1.60 ± 0.40 * #	0.98 ± 0.52	1.81 ± 0.50 * *
GLU(mmol/L)	4.25 ± 3.02	4.44 ± 2.83 *	8.85 ± 2.12	6.15 ± 2.43 * *
BUN(mmol/L)	4.52 ± 2.13	4.34 ± 1.93 *	8.74 ± 1.93	5.22 ± 2.12 * *

Note: Compares with the nutrition support before, * $P < 0.05$, *# $P < 0.05$; First day compares after the technique, * * $P < 0.05$

注: 与营养支持前比较, * $P > 0.05$, *# $P < 0.05$; 与术后第一天比较, * * $P < 0.05$

2.2.2 Treatments results Patient technique has the varying degree the malnutrition, liver function barrier, the immunity is somewhat low, in front of after the technique the nutrition supports 5 day to have the distinct improvement (* $P < 0.05$, *# $P < 0.05$); in the technique has the blood sugar undulation, the electrolyte disorder; after the technique appears the liver function a series of discompensation illness complication to refer drafts: the cholinesterase excessively is low, ALT, AST, GGT and the TB excessively are high, the TP and the A/G is low, at the same time appears the low K⁺ blood sickness, the low Na⁺ blood sickness, the high glycemia, the low proteinemia and so on. After the technique the nutrition supports 10 day, the above symptom all has the remarkable improvement (* * $P < 0.05$), Patient weight gain.

2.2.3 Illness complications and the case fatality rate 8 examples get sick average per person smoothly passed the surgery time, died 0 examples (0%); But all has had the high glycemia, high Anxue sickness, the low ALB and the electrolyte is unbalanced.

3 Discussions

Liver function lose the commutation illness complication, the main performance is: the cholinesterase excessively is low, ALT, AST, GGT and the TB excessively are high, the TP and the A/G is low, at the same time appears the low K⁺ blood sickness, the low Na⁺ blood sickness, the high glycemia, the low proteinemia and so on. After the liver leaf excises the patient technique to have the liver function discompensation illness complication, is the patient appears other illness complications, the liver function failure and even the death main reason. Therefore, after the technique adopts the essential measure active control liver function discompensation illness complication, excises the patient regarding the liver leaf to be restored to health has the vital significance, but encircles the surgery time to give the suitable nutrition support, but effectively corrects patient's malnutrition and metabolism barrier.

This experimental station contains with the TNA place Chinese government: (1) thin iris sugar peptide: mainly includes the polysaccharide and the multi- peptides, has the adjustment organism exemption from service function, the promotion nucleic

acid and the protein biosynthesis; (2) compound coenzyme: mainly includes coenzyme A, the coenzyme I, three adenylic acidglucoside, the return to original state Guguangantai, the nucleotide and so on, They are mostly in the human body the acetylyze response, the redoxraction and the energy metabolism important coenzyme; (3) mannan peptide: can promote the circumference white blood cell, the activation macrophage and the lymphocyte. After all these functions are precisely the liver excise the patient technique to need, because the liver function not good patient mostly exemption from service function is low, the nucleic acid and the protein biosynthesis function reduces.

The influence technique the liver function loses the commutation the factor to be extremely many, at present has not formed an internationally recognized appraisal system. Ma Weidong, Li Qiang and so on^[1] think regarding the conventional liver function chemical examination target, all has the significance after the technique and the technique is the cholinesterase. As a result of the cholinesterase only can in the liver synthesis, also is very short in vivo metabolism time, the 1st day cholinesterase then obviously drops after the technique, the cholinesterase change can reflect the liver function the situation. This group of materials demonstrated, this experimental station the nutrition supports 5 day with the TNA place alchemy in front of to be possible obviously to cause the cholinesterase to elevate, but after the technique the nutrition supports 10 day to be possible to cause the technique the low cholinesterase to rise to the normal level.

Because in front of technique liver metabolism function barrier, causes the liver function discompensation time patient varying degree the protein malnutrition, often can continue after the liver function loses the commutation time technique quite section of times, Influence prognosis^[2]. Before the liver leaf excision liver function restores, the synthetic protein function serious is insufficient, The massive myogens decomposition energizes, organism finally appears the massive nitrogen to lose^[3], creates in vivo various internal organs the protein content sharp decline, Easy to produce the multi- organs function barrier. Protein decomposition increase, the plasmin is specially the albumin synthesis reduction as well BCAA consumes the increase to the branched chain

amino acid, The liver to the aromatic amino acid (AAA) metabolism barrier is the liver function not entire patient's proteometabolism characteristic. BCAA increase liver cancer patient albumin synthesis, And is possible to improve its survival rate. Therefore, after the technique should guarantee the albumen and the branched chain amino acid input value, by protects the liver leaf excision liver and organism important internal organs function. This group of selected patient gives the TNA support in the conventional treatment foundation which this experiment designs, the nitrogen quantity is $0.25 \sim 0.30 \text{ g}/(\text{kg}/\text{d})$, Provides by $5\%18$ kind of compound amino acids; like the patient serum albumin is lower than 30 g/L , then other supplement human body albumin ($10 \sim 20 \text{ g/D}$).

Loses in the commutation time technique in the liver function, organism water and the electrolyte disorder are extremely easy to occur or to aggravate. This group of materials demonstrated, the liver function loses in the commutation time technique to be easy to technique latter 24 h to appear the low blood K^+ , This the K^+ store up reduces, the liver leaf with the technique in front of excises in the process the $\text{Na}^+ \text{K}^+$ duty of pump abnormal, the K^+ supplemented in the insufficiency, the technique the massive liquids turnover, the diuresis, anaesthesia drugs, the liquid management is bad, the digesting fluid loses, the wound responded sends the aldosterone secretion increase and so on many factors to concern. But the low Na^+ blood sickness often is comprehensive, It produces reason and mechanism possibly for^[4-7]: (1) liver function barrier, in vivo high energy phosphoric acid key reduces, the Na^+ pumping is weaken, in the cell the Na^+ cannot transport on own initiative to the extracellular, causes the extracellular Na^+ reduction. The specific weight low blood Na^+ may cause the brain cell dropsy, creates the durable serious central nervous system system harm, also the low Na^+ may cause the kidney function to receive the harm, Induces or aggravates the hepatorenal synthesis to draft. (2) liver cirrhosis, as a result of patient body fluid nerve factor disorder and so on in vivo aldosterone, anti-diuresis hormone, heart Na^+ element and catecha phenol amine, influence water Na^+ metabolism, urges the low Na^+ blood sickness occurrence. (3) liver cirrhosis often causes the low K^+ blood sickness, lacks when the K^+ because the Na^+ enters in the cell, causes the extra cellular fluid Na^+ content to reduce but sends lacks the K^+ low Na^+ blood sickness. (4) Na^+ absorbs is insufficient, like limits the salt-making excessively taking in, Long-term low Na^+ diet, Eats food few and vomits, digestive tract and so on diarrhea loses the Na^+ . Human and so on Tian Yi^[8] observes discovered that, In low Na^+ , in low Cl^- pattern, Low Na^+ , low Cl^- presents the correlation, The prompt salt takes in the insufficiency, Possibly is causes low Na^+ , the low Cl^- immediate cause. (5) medical-

source: Like the diuretic not reasonably applies and massively puts the ascites to cause the Na^+ to discharge excessively many has not been able promptly to obtain the supplement. Human and so on Tian Yi^[8] observes discovered that, along with liver function harm aggravating, the low Na^+ blood sickness occurrence is rising gradually; the low Na^+ blood sickness is possibly one of reasons which the liver cirrhosis serious illness complication and dies of illness. Therefore, the low Na^+ blood sickness and the patient condition weight, the illness complication and the prognosis concern. Regarding concurrent low Na^+ blood sickness treatment, because has the reason and the mechanism is different, the method of treatment also differs from. First should distinguish the low Na^+ blood sickness cause of disease type, mainly is limits the water, the diuresis regarding the dilution low Na^+ blood sickness and makes up the Na^+ ; regarding loses time the Na^+ low Na^+ blood sickness, Should infuse, make up the Na^+ ; but regarding lacks the K^+ low Na^+ blood sickness mainly supplements the sylvite. This group of selected patient in conventional treatment foundation, right amount have supplemented electrolyte ingredient and so on the K^+ , Na^+ , Ca^{++} , Cl^- , Mg^{++} according to various patients' special details, promptly effectively corrected the electrolyte disorder situation.

The liver leaf excises the patient to encircle the surgery time liver glycogen reserve reduction, the sugar tolerance drops, Insulin increase, The sugar different lives the increase. After the liver excision the liver line grain of body oxidation phosphorylation ability drops, the liver margin of energy reduces, energy matrix use barrier, reduces to the glucose metabolism speed, adds the wound which the surgery is the result of, should stir up with the original liver function not entire, after causes organism technique the sugar to endure the difference and the insulin resistance, this time often appears the serious high glycemia. Therefore, should strictly monitor the blood sugar level and the right amount supplement insulin by the active control the high glycemia illness complication. The insulin not only the promotion glucose oxidation energizes, also is one kind kisses the liver factor, is advantageous in the patient liver function improvement, the glucose adds the extraneous source insulin is outside the intestines the nutrition commonly used power supply way. This group of selected patient in conventional treatment foundation, according to patient's blood the glucose value, adjustment sugar, the insulin ratio of: $3 \sim 8 \text{ kJ}: 1 \text{ U}$, Promptly effectively corrected patient's the high glycemia illness complication.

In the synthesis analyzes the discussion, the liver leaf excises the patient to encircle the surgery time to give the suitable nutrition support, but effectively corrects patient's malnutrition and metabolism barrier, but the active control liver function loses the commutation illness complication, promotes the patient to be

restored to health.

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