

# Analysis of Enteral Nutritional Value in Severe Craniocerebral Injury

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**Abstract: Objective.** This study will analyze the clinical value of enteral nutrition treatment in patients with severe craniocerebral injury and discuss the safety of this treatment. **Methods.** This study selected patients who were treated in the hospital from January 2017 to December 2018. After the screening, all patients were diagnosed as severe craniocerebral injury. Forty-four patients who have met the experimental criteria were undergone enteral nutrition treatment to improve the condition. The success rate of catheterization and the changes in patient's vital signs were analyzed. Especially the effect on the disease after the insertion of nasogastric tubing for nutritional treatment. **Results.** From the treatment results, the success rate of catheterization was 95.45% (42/44). In term of the timeline, the average was (36.5±2.7) min, the shortest time was 30 minutes and the longest time was no more than 5 minutes. The vital signs were stable before and after treatment and no complications such as arrhythmia. For those 42 successful patients, the average time for jejunal nutrition therapy was (36.2±4.1) days, the shortest was 27 days while the longest was 53 days and no adverse cases occurred. **Conclusion.** Enteral nutrition has a clinical application on patients with severe craniocerebral injury and can meet the nutritional needs of patients. Moreover, it has a high degree of feasibility and safety which is conducive to the early recovery of patients and has been well received.

**Keywords:** Severe craniocerebral injury, Jejunal nutrition, Catheterization, Vital signs

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## 1 Introduction

Patients with severe craniocerebral will enter a state of high energy consumption. At the same time, the body's immunity is weak, and the prognosis of patients is very unsatisfactory due to high catabolism and muscle protein breakdown. At the same time, it may lead to gastrointestinal dysfunction. The causes include damage of hypoxia on the gastrointestinal mucosa, gastrointestinal obstruction and the damage on the barrier function of the intestinal mucosa. Meanwhile, it is difficult to maintain the balance of the body's capability and it is necessary to improve the condition with treatment. In this study, patients who treated in the hospital from January 2017 to December 2018 were selected. After the screening, they were diagnosed as severe craniocerebral injury. Forty-four patients who met the experimental criteria were undergone enteral nutrition treatment to reduce the disability rate, mortality rate and promote the recovery of patient's nerve function.

## 2 Information and methods

### 2.1 General information

In this study, patients who treated in the hospital from January 2017 to December 2018 were selected. After the screening, they were diagnosed as severe craniocerebral injury and 44 patients who met the criteria were underwent enteral nutrition treatment to improve the condition of symptom. Among them, there were 26 males and 18 females. The patients were between 24–71 years old and the average age was (45.6±3.3) years old. According to the Glasgow Coma Scale, the average score is (7.1±1.5). In the specific diagnosis, 12 cases were epidural hematoma, 10 cases

were intracerebral hematoma, 8 cases were subdural hematoma and the rest were cerebral contusion and primary brain stem lesions.

## 2.2 Treatment method

Patients need to undergo nasogastric intubation, and professional neurosurgeon and nurses carry out the operation to complete enteral nutrition treatment. The patients need to be prepared in a supine position and intravenously administered metoclopramide before intubation to record the length of the nose between the nose and the earlobe. The catheter is intubated with a guidewire with the aid of paraffin oil to enter from the front end. When reaching 10–15 cm of throat portion, the patient is required to raise the head to complete the operation of the nasogastric tube entering the stomach. In addition, when the nasogastric tube is introduced into the jejunum, the patient is required to prepare a position of 30° and 40° to the right. The tube was sent to inside by tracking the patient's breathing and experimental standards were followed to complete the subsequent steps before fixing the tubing route.

## 2.3 Evaluation standard

In this experiment, the success rate of catheterization and time-consuming are used as the basis of evaluation criteria. In addition, it is necessary to pay attention to the changes in patient's vital sign, which is also the primary prerequisite of the therapy. At the meantime, whether patients have gastrointestinal bleeding,

perforation and arrhythmia are the key issues to be concerned to ensure the safety of the therapy.

## 2.4 Statistical method

In this study, the therapy results of patients with severe craniocerebral injury were discussed based on the data and analyzed with professional software SPSS 19.0. Under the confirmation of the data indicators, it is possible to better judge the improvement of the patient's condition. Specifically, in this study, measurement statistic was used on the time of enteral nutrition and the counting statistic was used in the success rate of catheterization and the statistical results were significant when ( $P < 0.05$ ).

## 3 Results

From the treatment results, the success rate of catheterization was 95.45% (42/44). In term of the timeline, the average was (36.5±2.7) min, the shortest time was 30 minutes and the longest time was no more than 5 minutes. The vital signs were stable (as shown in Table 1), and no complications such as arrhythmia. For those 42 successful patients, the average time for enteral nutrition treatment was (36.2±4.1) days, the shortest was 27 days while the longest was 53 days and no adverse cases occurred.

At the same time, two reasons for patients with failed catheterization were analyzed. One is categorized as gastroptosis while another one is intubation into the lung.

**Table 1.** Comparison of patient's vital signs before and after catheterization ( $\bar{x} \pm s$ )

Time	Heart rate (times/min)	Blood pressure (mmHg)	Breathing (times/min)
Before	78.23±12.53	162.25±25.74/88.51±12.02	20.80±3.28
After	80.10±13.05	164.25±1.28/91.22±12.08	21.52±4.58

## 4 Discussion

Patients with craniocerebral injury often have a high metabolic statuses such as increased oxygen consumption and gluconeogenesis and others<sup>[1]</sup>. At this time, problems such as malnutrition, infection and even multiple organ failure may occur. Early implementation of enteral nutrition during the treatment can help to reduce the chance of complications.

Enteral nutrition needs to be carried out through the nasogastric intubation to prevent the reflux of nutrient

solution, which can avoid the occurrence of safety accidents. The nasogastric tube is very difficult to be viewed during intubation, which including x-ray and endoscopic introduction. The former is radiative while the latter has higher costs and quite risky<sup>[2]</sup>. The way of blindly inserting the nasogastric tube has been widely used. For patients with more serious conditions, safe intubation can prevent problems such as tube obstruction. In clinical applications, nasogastric intubation can improve the nutrition value is a relatively simple operation. For exogenous injury, the patient's

central nervous system is abnormally excited, and its sympathetic tone is increased which is prone to stomach damage especially when gastric mucus secretion is reduced and may lead to gastric ulcer bleeding<sup>[3]</sup>. Due to the patient's long period of coma and mainly lay on the bed, the gastrointestinal function is altered. Thus, the patient needs nutritional supplements to improve the efficiency of nutrient absorption.

In summary, enteral nutrition treatment has clinical application for patients with a severe craniocerebral injury, which can help to meet the nutritional needs of patients. It is also highly feasible and safety, which is conducive to the early recovery of patients and has been well received.

## References

- [1] Liao SF, Chen HM, Zhang YW, Wu GX, Huang GH, Yu JG, Guan DG. Application of nasal jejunal tuberculosis plus nasogastric tube decompression in severe craniocerebral injury and gastric fistula[J]. Chinese Journal of Injury and Restoration (electronic version), 2014, 9(03):277–81.
- [2] Lei L, Chi RB, Lin T, Liao WY. Feasibility and safety of bedside blind hand insertion of a jejunal tube in patients with severe craniocerebral injury in ICU[J]. Journal of Medical Sciences, 2018, 8(17):212–4.
- [3] Wang CY, Wang CL, Wang RL, Fan WG. Comparison of the application of nasogastric tube and nasal jejunal tube in enteral nutrition in patients with severe head injury[J]. Journal of Inner Mongolia Medical University, 2015, 37(S2):57–9.