Impacto de la nutrición enteral temprana en pacientes con traumatismo craneoencefálico en la Unidad de Cuidados Intensivos de un hospital mexicano

Impact of early Enteral Nutrition in patients with traumatic brain injury in a Mexican hospital Intensive Care Unit

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Resumen

Objetivo

El objetivo fue determinar el impacto de la nutrición enteral temprana en la morbi-mortalidad y días de hospitalización en el paciente con traumatismo craneoencefálico (TCE) que ingresó en la Unidad de Cuidados Intensivos de un Hospital de segundo nivel en México.

Métodos

Se realizó estudio descriptivo, retrospectivo y de correlación, se revisaron 33 expedientes clínicos de pacientes hospitalizados en la Unidad de Cuidados Intensivos (UCI) con diagnóstico de TCE, de enero a diciembre de 2012, de los cuales se eliminaron tres por no cumplir con los criterios de inclusión. Se realizó análisis de prueba T y correlación de Pearson, $p<0.05$.

Resultados

En el periodo de un año ingresaron a la UCI 33 pacientes con TCE, 30 se incluyeron en el estudio al cumplir con los criterios de inclusión; 90 % (27) fueron hombres y 10 % (3) mujeres, con un promedio de edad de 33 años en hombres y 18 años en mujeres. Se administró dieta enteral (licuada) al 86.6 % (26 pacientes); a 10.0 % (3) dieta vía oral y a 2.3 % (1) no se le administró dieta por fallecimiento; al 42.3 % se le administró dieta enteral dentro de las primeras 48 horas de su ingreso a la UCI; 91.6 % presentaron complicaciones infecciosas y 20 % de mortalidad en general. El promedio de días de estancia hospitalaria en la UCI fue de 7.5 días. Se encontró una relación significativa ($p<0.05$) entre el tiempo de inicio de la dieta con días de estancia hospitalaria, días de intubación endotraqueal y el conteo leucocitario a su egreso.
En ninguno de los pacientes se realizó evaluación nutricional al ingreso a la UCI.

Conclusiones

El empleo de nutrición enteral temprana (antes de 72 horas) en el paciente con TCE, disminuye la incidencia de infecciones nosocomiales, días de ventilación mecánica y de estancia hospitalaria en la UCI.

Palabras clave: nutrición enteral, traumatismo craneoencefálico, morbimortalidad, estancia hospitalaria.

Abstract

Objective The objective was to determine the impact of morbidity-mortality early enteral nutrition and days of hospitalization in patients with Traumatic Brain Injury (TBI) who was admitted to the intensive care unit of a Hospital of second level in Mexico.

Methods Descriptive, retrospective study was conducted and correlation, we reviewed 33 clinical records of hospitalized patients in the Intensive Care Unit (ICU) with a diagnosis of TBI, from January to December 2012, of which three for failing to comply with the inclusion criteria were eliminated. Analysis of T test and Pearson correlation, $p < 0.05$.

Results In the period of a year entered the ICU 33 patients with TEC, 30 were included in the study to meet the inclusion criteria; 90% (27) were men and 10% (3) women, with an average age of 33 years in men and 18 years for women. Was administered enteral diet (blending) the 86.6% (26 patients); 10.0% (3) diet oral and 2.3% (1) not be administered diet by death; the 42.3% was administered enteral diet within 48 hours of their admission to the ICU; 91.6% had 20% mortality and infectious complications in general. The average number of days of hospital stay in the ICU was 7.5 days. A significant relationship was found (p < 0.05) between the start time of the diet with days of hospital stay, days of endotracheal intubation and leukocyte count to their exit. In none of the patients was carried out nutritional assessment at admission to the ICU.

Conclusions The use of early enteral nutrition (within 72 hours) in patients with TCE, decreases the incidence of Hospital-acquired infection (HAI), also known as Nosocomial Infections, days of mechanical ventilation and ICU hospital stay.

Keywords: enteral nutrition, TBI, morbidmortality, length of stay, WBC.

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Introduction

The TCE usually occurs in young, previously healthy patients and with good nutritional status. 1,2 In spite of this, the metabolic changes caused by the traumatic assault placed these patients at nutritional risk. Nutritional support should start as soon as possible when the nutritional requirements can not be covered orally over a period of 5-10 days upon arrival in the Intensive

Care Unit (ICU).2,3 Two-thirds of all patients experience deterioration of their nutritional status during their stay hospitalaria. 4,5 Studies report that malnutrition in hospitalised subjects ranges from 30 to 50%. 6 Acute disease exacerbates the poor nutritional status of the patient by increasing metabolic demands and make more difficult the use of nutritional substrates. Critically ill patients often receive inappropriate nutritional during your stay in the ICU support, since doctors underestimate their nutritional needs and the beginning of the nourishing support is often delayed. 7 The malnutrition associated with the absence of oral intake of the patient, leads to alterations of the structure and function of the intestinal mucosa, an increase in the inflammatory response and an increase in infectious morbidity.8 Currently establishes that the main objective for the administration of enteral feeding is to preserve the functions of the intestine barrier and restore the intestinal integrity, thus enteral feeding decreases intestinal atrophy, which is found in studies in polytraumatized patients, in which the early administration within 24 hours of their admission to the ICU helped prevent or reduce intestinal permeability. 9 On the other hand, the specialized nutritional support should be adjusted individually, and should be considered in the prevention of secondary brain damage in patients with TCE and this should start as soon expected that nutritional requirements may not be covered by mouth in 5 to 10 days of admission to the ICU 10

The biochemical evaluation is used to detect subclinical deficiencies, provides an objective means of assessing the nutritional status, regardless of subjective factors. It is the determination of plasma concentrations of hepatic synthesis of some proteins that are related to the state of the visceral compartment, so as serum albumin concentration reflects the synthesis, degradation, loss and exchange between the intravascular and extravascular space. Also, the serum albumin is affected under stress or acute illness. However, in the critically ill patient it was found that a lower concentration of 3.5 g / dl is associated with increased morbidity and mortality.[11]

In daily practice is generally immune status values with the number of total lymphocytes, taking as reference the following parameters: mild malnutrition: 1200-2000 Lymphoma / mm3; moderate malnutrition: 800-1200 Lymphoma / mm3; and severe malnutrition: <800 Lymphoma / mm3.11

The aim of this study was to determine the relationship between early initiation of enteral nutrition and its impact on morbidity and mortality and hospital days in patients with TBI admitted to the ICU of a second level Hospital Mexico.

Methods

Study design

Descriptive, retrospective correlation study, based on the obtained secondary information from medical records of all patients admitted to the ICU of a second level hospital in Mexico, during the period From 1 January to 31 December 2012 diagnosed with TBI.

Inclusion and exclusion criteria

Patients with head trauma, sex indistinct, over 18 years, Glasgow> 8 were admitted to the ICU of the General Hospital of Mexicali in 2012. those patients who did not meet the inclusion criteria were excluded; burn patients; patients presenting: severe hemodynamic instability; mechanical or complete functional bowel obstruction; Free gastrointestinal perforation, shock and intestinal ischemia; acute gastrointestinal bleeding; severe / vomiting intractable diarrhea; severe bad absorption; diffuse peritonitis; enteric fistulas high expenditure; expectancy of less than 24 hours (Glasgow <5) life; severe malnutrition with the following parameters: BMI <16Kg / m2; albumin <2 g / dl; <800 cells / mm3; morbid obesity (BMI> 40); pregnancy; COPD; AIDS and other patients in research studies.

Procedures

Starting from the medical record medical and nursing information was collected to study the following variables: age, sex, Glasgow Coma Scale (ECG) (slight> 14, moderate 9-13, severe <8); Start diet (in hours of admission to the ICU), type of diet (liquefied, polymeric, normal), route of administration (enteral, parenteral) administered calories (which is referred) complications (pneumonia, sepsis, urinary tract infection, renal failure); income antibiotics (yes,

no); days of mechanical ventilation, length of stay in ICU, nutritional markers at admission and discharge as leukocytes (normal: 4000-11000 / ul), lymphocytes (normally> 2000 Lymphoma / mm3), albumin (normal: 3.5-4.5 g / dl) and total protein (normal: 6.0 to 8.3 gm / dL), infectious complications, reason for discharge (discharge from the ICU, transfer, voluntary discharge, death) and date of death.

They were carried out relevant administrative procedures in the General Hospital of Mexicali, requesting authorization to the Ethics Committee of the UABC.

Statistic analysis

For statistical analysis, SPSS for Windows version 20.0 was used through which descriptive statistics such as frequencies and percentages were obtained. T Test a sample related to the analysis of albumin and lymphocytes; Pearson correlation ($p < 0.05$) for the relationship between the variables GCS, mortality, diet, leukocytes, lymphocytes, albumin complications, days of mechanical ventilation, length of hospital stay and mortality. A significance level of 95% ($p < 0.05$) was considered.

Results

33 TBI patients admitted to the ICU during the period of a year, only 30 were included in the study to meet the inclusion criteria; 90% (27) were men and 10% (3) women with an average age of 33 years for men and 18 years for women.

With respect to gravity, by reference to the ECG was found that 40% had mild head injury, 36.6% moderate and 23.3% severe (Table 1).

Table 1. ECA's ECG severity in patients with TBI in the ICU of the General Hospital of Mexicali.

n=30

Gravedad	No.	%
Leve ≥ 14	12	40.0
Moderado 9 - 13	11	36.6
Severo ≤ 8	7	23.3
Total	30	100

Fuente: Expedientes, Hospital General de Mexicali.

Enteral diet was administered to 86.6% (26 patients); 10.0% (3) oral diet and 2.3% (1) he will not be given death diet; to 42.3% enteral diet was administered within the first 48 hours of admission to the ICU (Table 2).

Table 2. Distribution of cases by time of onset of enteral diet, in patients with TBI in the ICU of the General Hospital of Mexicali.

n=26

Inicio de dieta en horas	No.	%
24	6	23.07
48	5	19.23
72	7	26.92
76	2	7.69
96	3	11.53
120	2	7.69
168	1	3.84
Total	26	100

Fuente: Expedientes, Hospital General de Mexicali.

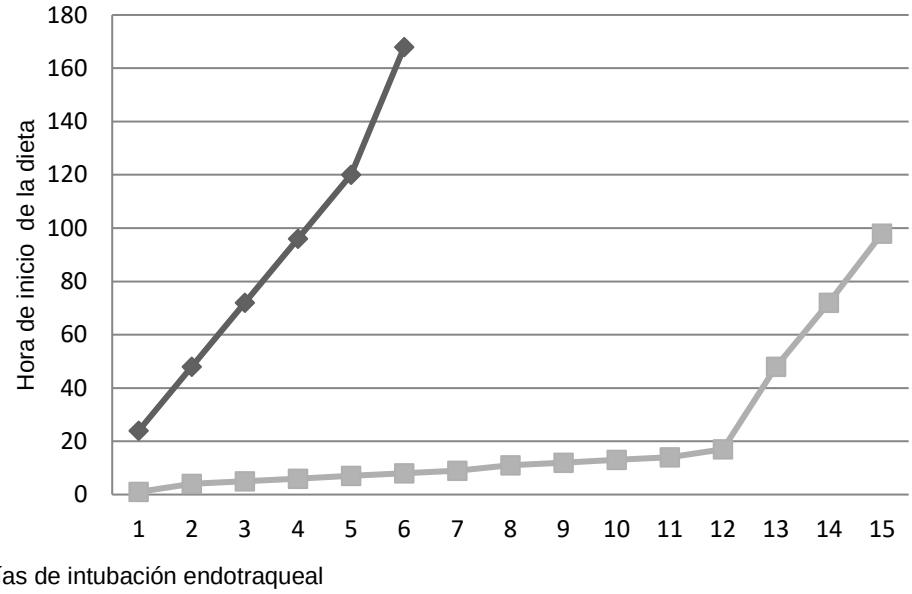
It is noteworthy that 84.6% (22) was administered liquefied diet and casting (handmade) by gastric tube, only to 7.6% (2) polymeric diet, the remaining 13.4%, one liquid diet and another normal diet. It is noteworthy that the caloric intake was estimated to be 25 kcal / kg / day in most patients and found no nutritional assessment by the nutrition service.

Of the 30 patients studied, 80.0% (24) had complications, the main pneumonia in 91.6% (22) and renal failure in 8.3% (2) patients. The main sign was fever, which occurred in 37.5% (9) of patients within the first 48 hours; in 41.6% (10) 72 to 96 hours and after 96 hours in 20.8% (5) patients.

At 96.7% (29) patients were given antibiotic from ICU admission and were also applied endotracheal tube for mechanical ventilation with an average of six days, being statistically significant the days of endotracheal intubation and time Start diet ($p < 0.022$); (Figure 1).

Figure 1. Starting time of diet and days of endotracheal intubation in TBI patients in the ICU of the General Hospital of Mexicali.

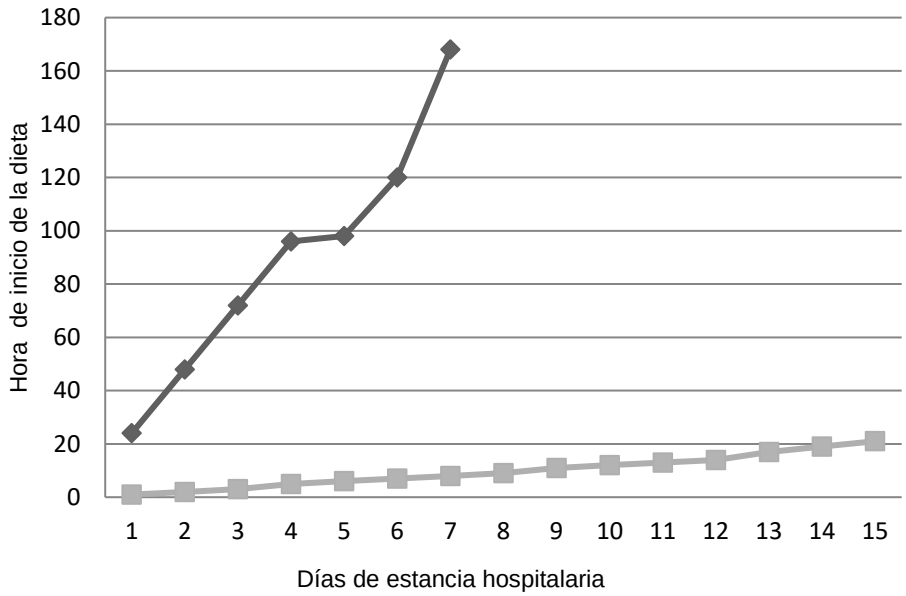
n=26



In relation to the days of stay in the ICU, the average was 7.5 days, with a minimum of one day (death) and a maximum of 15 days. A statistically significant relationship between the start time of diet and days of hospital stay ($p < .044$) was found; (Figure 2).

Figure 2. Start time diet and length of hospital stay in patients with TBI in the ICU of the General Hospital of Mexicali.

n=26



As for the reason for discharge, 70% (21) was for improvement, 20% (6) death, 10% (3) transfer, of which one went to his home.

Biochemical markers of nutritional conditions, determinations of leukocytes, lymphocytes, albumin and total protein were contemplated, half of leukocytes to the entry of 17.139 mm3 and the exit of 15,236 mm3 ($p < 0.0001$), lymphocytes income 17.81% was found and 17.34% at discharge ($p < 0.0001$) compared to albumin, an average income of 3.0 g / dl and at discharge of 2.6 g / dl ($p < 0.0001$) and total protein, average income 5580 g / dL and at discharge 5,413 g / dl ($p < 0.0001$). A significant relationship ($p < 0.05$) between the early initiation of enteral nutrition days in hospital, and the leukocyte count at discharge (Table 3) was found.

Table 3. Distribution of means in TBI patients in the ICU of the General Hospital of Mexicali. n=30

Resultados bioquímicos	Ingreso	Egreso
Leucocitos	17.139 /mm^3	15.236 /mm^3
Linfocitos	17.816 %	17.346 %
Albúmina	3.01 g/dl	2.633 g/dl
Proteínas totales	5.580 g/dl	5.413 g/dl

Fuente: Expedientes, Hospital General de Mexicali.

Discussion

According to the results, the age group with the highest incidence of TEC was 14 to 34 years of age, finding similar results in previous studies that reported the highest incidence in patients under 40 years of age, which corresponds to the age greater productivity be humano.12-14

The most affected was the male gender, consistent with previous studies where a prevalence of 71.6% ECA and 71.7%, this can be associated with daily activity performed by the hombre.15-17

The most common complication was represented by pneumonia, which explains endotracheal intubation, prolonged bed rest and the start of nutrition after 72 hours after admission to the ICU, showing the same results in other estudios.18 As at the beginning of nutrition and days of endotracheal intubation, you can see a parallel relationship; Later between enteral nutrition is started, more they will be the days of endotracheal intubation with their respective consecuencias.19 (Figure 1).

It is noteworthy that the onset of fever as a sign of infection was observed in 62.4% of patients corresponding to the group of patients who were fed after 72 hours after admission to the ICU. At 96.7% it was administered antibiotic for entry, which would mean that the infectious process should be controlled, however, it is as a consequence to longer than 48 hours fasting, leading to atrophy of the intestinal mucosa with the implications already known. In the meta-analysis on 11 studies, whose aim was to quantify the effect of nutritional support following head injury on mortality and morbidity, it was concluded that early feeding may be associated with fewer infections and a trend towards better resultados.20

Regarding mortality low (6.7%) prevalence was found, unlike other studies in which a mortality of 23% was reported, 30%, 43.3%, 13,14,16 which could be related to the that 76.0% of patients had mild to moderate TBI.

For the assessment of nutritional status in critically ill patients is usually resorted to the use of the usual methods used in other patients as anthropometric variables, biochemical markers and functional tests. The subjective global assessment is based on the clinical interpretation of some symptoms, signs and physical parameters method, this is a good indicator of malnutrition and the possibility of complications in patients crítico.21, 22

On this point, it is noteworthy that not carried out; weight only recorded on admission to the ICU and subjectively as it does not have scale to weigh the patient, so this is a deficiency for from a real assessment and to take into account this parameter in nutritional status patient. While the size is relatively easy to measure due to the simplicity and low cost of the implement used, its measurement is an unusual practice in the ICU, so the lack of registration of height and weight at admission is considered by many authors as one of the hospital practices that favor malnutrition during the hospitalización.23

Albumin is the most frequently used biochemical parameter in nutritional assessment for its accessibility and low cost. A significant reduction in albumin levels are associated with an increase in the occurrence of complications and mortality. Albumin levels at admission of critically ill patients have prognostic value, but these are few sensitive to acute changes in nutritional status as albumin has a half life of about 20 days. Thus, serum albumin is not a good parameter for nutritional follow-up, although values can be related to the extent and severity of the injury, however, it is one of the parameters that are included in the institution of salud.19 22 23

Studies report the use of serum albumin as a marker of malnutrition, being in all these decreased lymphocytes and albumin association with weight loss, infections and more mortalidad.19, 22, 23

In the present study is consistent with the above can be observed as a decrease in albumin, leukocytes and lymphocytes patient on discharge.

Regarding the length of hospital stay, there is evidence that malnutrition is associated with prolonged stays also observed an increased risk of complications associated with prolongation of stay and the progressive deterioration. In the study by Pérez de la Cruz, malnourished patients remained hospitalized 10.4 days compared with 7.5 days in well-nourished patients, similar results were obtained in our study with 7.5 average days of hospital stay, however, we can not confirm presence of malnutrition or the degree of desnutrición23, however, in Figure 2 can be seen that increase the length of hospital stay between later it is the beginning of nutrition.

Conclusions

After reviewing 30 clinical records of patients admitted to the ICU with a diagnosis of TBI, in order to determine the relationship between early initiation of enteral nutrition and its impact on morbidity and mortality and hospital days, we can conclude that the Early use of enteral nutrition (within 72 hours) in patients with TBI, decreases the incidence of nosocomial infections, ventilator days and length of stay in the ICU.

Recommended

It is important to implement a protocol of evidence-based nutritional management, based on the evaluation of the nutritional status of each patient in critical condition to enter the ICU, and so raise the objectives and the strategies to follow in order to provide adequate nutritional support taking into account, among other factors, the basis of the patient's disease; thus, it is necessary to have a team of health that includes nutrition service for the unification of criteria. Moreover, it is very important the clear allocation of responsibilities within the team, maintaining communication and cooperation among its elements.

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