Universe Scientific Publishing

ORIGINAL ARTICLE

Clinical Study of Simple Plasma Exchange in the Treatment of Severe Autoimmune Hepatitis

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ABSTRACT **Objectives:** Plasma Exchange (PE) in the treatment of severe autoimmune hepatitis and the clinical outcome of the clinical data were retrospectively analyzed. The clinical efficacy and safety of single plasma exchange (PE) in the treatment of autoimmune hepatitis were also evaluated. **Method:** The PE group of 22 patients was given conventional treatment of combined treatment of patients with simple PE while 21 cases of the control group were treated with comprehensive treatment. The efficacy of PE group and control group were compared within 2 weeks. **Results:** The clinical symptoms of 22 patients in PE group were significantly improved ($p < 0.05$); in total bilirubin (TBIL), (AST), (INR), (ALT) where the PE group (17/22) 77.27%, and control group (10/21) 47.62%. The difference was statistically significant ($p < 0.05$). **Conclusion:** Pure plasma exchange (PE) is an effective method for the treatment of severe autoimmune hepatitis (AIH).

KEYWORDS

Plasma exchange

Autoimmune hepatitis

Clinical efficacy

1. Introduction

Autoimmune hepatitis (AIH) is a chronic disease of unknown cause and is characterized by chronic liver hepatocellular inflammation and necrosis and has a tendency to progress to cirrhosis. High gammaglobulin hyperlipidemia with the present of serum autoantibodies will cause histological change of the liver. Some studies approved that cytokines and immune cells, genetic background, immune regulation network and other factors may cause damage to the liver cells [1]. The disease occurred in the whole world, the incidence of the disease in Europe and the United States is higher, the AIH reports in China are rare, but the trend is rising year by year. The disease is more common in women, male and female where the ratio is 1:4, any age can be at the age of 50 years old. However, severe cases such as non-timely treatment causing 6 months of high mortality rate of 40% [2]. In this study, 43 cases of autoimmune hepatitis were retrospectively analyzed, and to explore the efficacy and safety of pure plasma exchange in the treatment of AIH.

doi: 10.18686/aem.v4i2.3

Received: February 19, 2015; Accepted: May 3, 2015; Published online: June 11, 2015

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2. Materials and methods

2.1. General information

In our hospital from March 2011 to March 2015, there are 43 patients with AIH were treated and were selected as the research object. Among them 9 cases were male, accounting for 20.93%, 34 cases of female accounting for 79.07%. The age of the patients are range from 28 to 65 years old, with average age (45.5 + 2.5) years old. Clinical manifestation: abdominal distension, fatigue, loss of appetite and jaundice. Inclusion criteria: (1) By clinical diagnosis for severe autoimmune hepatitis person; (2) Without renal failure; (3) Coagulation dysfunction; (4) Operative tolerance and agreed to the project. Exclusion criteria: Patients with severe autoimmune hepatitis complicated with hypertension and diabetes mellitus. The patients were randomly divided into PE group (22 cases) and control group (21 cases) with the approval of the ethics committee and the consent of patients. The gender, age, symptoms and clinical manifestations of the two groups were not statistically significant ($p > 0.05$).

2.2. Inspection and diagnosis

A total of 25 patients were treated with 48h in the diagnosis and treatment where the clinical examination results

were as follows; liver function for hepatitis B changes, a globulin or IgG rise which is greater or equal to 1.5 times than the normal limit;. Antibodies of patients with antinuclear antibody (ANA) positive, flat rate 75%, muscle antibodies (SMA) positive, some patients appear extrahepatic autoimmune diseases. The pathological changes of the patients were examined by histopathological examination, such as the changes of the liver and the appearance of the leaf, the change of the rose and the necrosis of the bridge. According to the 2002 American Institute, the diagnosis of liver diseases can be diagnosed as autoimmune hepatitis [3].

2.3. Method

This retrospective study included clinical data of 43 patients with severe autoimmune hepatitis (AIH) were evaluated by retrospective clinical data analysis, and combined with the research data of domestic and foreign scholars and the effect of single plasma exchange (PE) in the treatment of autoimmune hepatitis (AIH) was discussed. According to the actual situation of the patient's body first, the control group was treated with medical therapy where the patients need to take anti-inflammatory drugs, such as Transmetil. After that, taking nucleoside analogue drugs (ADV, ETV, and LAM) for antiviral therapy while transplantation surgery can be implemented for severe cases of liver disease. On the other hand, for PE group, the group is on the basis of the implementation of the pure blood plasma replacement therapy. Implementation of deep vein catheterization was applied to the patient according to the static pulse and the actual situation of the body. Plasma exchange parameters are as follows: blood flow 90 mL to 1000 mL of heparin saline (containing 50 mg heparin), plasma exchange amount 2500 mL of management for flushing heparin to maintain the volume 5 mg/h. The Asahi medical COLTD-Plasauto iQ21 type hemodialysis machine (Japanese rising sun Medical Corporation production) was used.

2.4. Observation index

Two groups of patients were examined based on the curative effect, the final cure rate, average hospitalization days, etc, after 2 weeks treatment of different treatment regimens.

2.5. Statistical methods

All the statistical analysis of the data was statistically analyzed by SPSS 17.0 software. Continuous data were expressed as mean ± standard deviation ($\bar{x} \pm s$). Student t test analyses for comparison between groups, all were done as 2-sided tests, when $p < 0.05$ was considered statistically significant.

3. Results

3.1. Biochemical indexes in two groups

The change of biochemical index after the simple plasma exchange is the best index to evaluate the treatment effect. There were significant differences before and after ($p < 0.01$) in TBiL treatment while AST and ALT were also significantly different before and after treatment ($p < 0.05$). However, in the TNR index, there was not statistically significant ($p > 0.05$) before and after treatment. The results of data analysis and statistical analysis show that pure plasma exchange has a certain effect on the treatment of autoimmune hepatitis, as shown in Table 1.

3.2. Comparison of clinical efficacy between the two groups

For patients with autoimmune hepatitis, simple plasma exchange is a better therapy. The results showed that the effective rate of PE group was 77.27% (17/22), while the control group was 47.62% (10/21), the difference was statistically significant ($p < 0.05$), as shown in Table 2.

4. Discussion

Autoimmune hepatitis is a kind of chronic inflammatory

Table 1. Changes of biochemical parameters in patients with severe autoimmune hepatitis treated by simple plasma exchange ($\tilde{x} \pm s$).

Treatment method	TBiL (umol/L)	ALT (U/L)	AST (U/L)	INR
PE before treatment (n = 22)	573.21 ± 161.98	158.37 ± 179.38	118.79 ± 98.39	2.17 ± 0.19
After PE treatment (n = 22)	308.12 ± 117.26	71.99 ± 61.20	59.18 ± 7.97	1.53 ± 0.27
t	8.554	8.954	8.325	1.029
p	< 0.001	< 0.05	< 0.05	> 0.05

Table 2. Comparison of clinical efficacy between the two groups [n (%)].

Group	n	Cure	Effective	Invalid	Total effective (%)
PE group	22	12 (54.55)	5 (22.73)	5 (22.73)	77.27
Control group	21	3 (14.29)	7 (33.33)	11 (52.38)	47.62
χ^2	-	7.667	0.601	4.044	18.744
p	-	< 0.05	> 0.05	> 0.05	< 0.05

disease of liver. According to the clinical research in the current medical field, the main clinical manifestations of this disease are different degrees of serum aminotransferase, immunoglobulin, and self-antibody ; the histological features of lymphocytes and plasma cells infiltration of the main interface hepatitis. Severe autoimmune hepatitis can rapidly progress to cirrhosis or liver failure. The incidence of autoimmune hepatitis in the whole world is at a high level, especially in Europe and the United States. The incidence and prevalence of this disease is not yet a systematic statistic.

Simple plasmapheresis is a process in which plasma components are removed from the blood, such as autoantibodies, that can cause autoimmune disease. The separation of blood of the patients with autoimmune hepatitis was mainly accomplished by automatic blood cell separator where separated the pathological antigen, antibody, immune complexes, protein, inflammatory mediators and toxins. After purification of blood the plasma with reconstituted treatment were returned back to the patients. The application in conventional therapy object was mainly concentrated whether the patient cannot get ideal effect or invalid in critically ill patients. Plamapheresis is an effective treatment in order to extend the life of patients and improve quality of life [4].

In the PE group, 22 cases were cured, the cure rate was 77.27% while in the control group was 21 cases and the cure rate was 47.62%. The effect of simple plasma exchange (PE) on the treatment of autoimmune hepatitis (AIH) is better than that of the conventional treatment. But the simple operation of plasma exchange (PE) may cause rash, face, lips, numbness or seizures, and anaphylactic shock adverse reaction. The most adverse reactions are improper operation, where anti-allergy measures adverse and indication of the uncertainty [5,6]. Therefore, the use of timely prevention and treatment are an effective ways where the majority of adverse reactions can be avoided and eliminated.

Currently, there are no specific drugs can be used to cured autoimmune hepatitis. For the moment, pure plasma exchange is the most extensive and effective method of treatment in combating the autoimmune diseases. However, there will be a series of complications after treatment, so comprehensive evaluation of patients' physical quality and the collection of patients and family members should be examined before the use of modified method in treatment.

Conflicts of interest

These authors have no conflicts of interest to declare.

Authors' contributions

These authors contributed equally to this work.

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