Clinical effects of perazine ferulate tablets combined with eucalyptol limonene pinene enteric soft capsules for treatment of children with IgA nephropathy

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Abstract. The clinical effects of perazine ferulate tablets combined with eucalyptol limonene pinene enteric soft capsules for treatment of children with IgA nephropathy were investigated. Sixty children with IgA nephropathy were included in the study and were randomly divided into the control (n=30) and observation (n=30) groups. The patients in the control group were treated with conservative or hormone therapy while patients in the observation group were treated with perazine ferulate tablets combined with eucalyptol-limonene-pinene enteric soft capsules. Clinical effects were observed and compared. The total effective rate of the observation group was significantly higher than that of the control group, while the incidence of complications was significantly lower than that of the control group (p<0.05). Serum IgA and fibronectin levels of the observation group were significantly lower than those of the control group, while the level of C3 was significantly higher than that of the control group (p<0.05). In conclusion, perazine ferulate tablets combined with eucalyptol-limonene-pinene enteric soft capsules constituted a safe and effective for the treatment of children with IgA nephropathy. The treatment was superior to conservative or hormone therapy, and thus worthy of clinical promotion.

Introduction

The morbidity of IgA nephropathy in children is 0.8%. Most children have good prognosis, with <5% of child patients showing rapidly progressive glomerulonephritis that develops into renal failure (1). At present, IgA nephropathy is caused by the precipitation of circulating immune complexes that contain IgA in kidney, and the antigen in the complex may be associated with the virus and bacteria from the respiratory tract or gastrointestinal tract mucosa or certain components of food (2). The typical symptoms include hematuria (75%), albuminuria (73%), low fever (65%), kidney area percussion pain (65%), small vascular fibrous necrosis (55%), and edema (55%) (3). Treatment suggestions include good rest, anti-infection and symptomatic treatment, if necessary, combined with adrenal cortical hormone and immunosuppressive therapy (4).

In Chinese medicine, the processing, extraction, concentration and blending of certain components of some plants, produces perazine ferulate tablets and eucalyptol-limonene-pinene enteric soft capsules. Previous findings confirmed that the two drugs can inhibit IgA from depositing in the kidney and can reduce the immune response (5).

In the present study, the safety and efficacy of a combination of the two drugs for the treatment of children with IgA nephropathy were also evaluated and clinical effects were compared with conventional western medicine to provide new ideas for clinical treatment.

Patients and methods

Patients. Sixty children with IgA nephropathy were included in the study. Diagnostic criteria of IgA nephropathy included: i) Clinical symptoms such as gross hematuria, and proteinuria; ii) kidney tissue puncture immune pathological examinations: a) light microscope showed glomerular number >6; b) immune fluorescence showed characteristic changes, immunoglobulin dominated by IgA showed granular or lump-like diffuse deposits in glomerular mesangial region, and some deposits alongside capillary loop; and c) electron microscope showed mesangial cell proliferation, increased mesangial matrix with large lump-like electron dense deposits; and iii) excluded Henoch-Schönlein Purpura nephritis, lupus nephritis, sicca syndrome, psoriasis, ankylosing spondylitis, liver cirrhosis, hepatitis B or C virus infection and other secondary IgA nephropathy. Patients that conformed to the diagnostic criteria of IgA nephropathy and patients that were treated for the first time were also included in the study.

Exclusion criteria were, patients with nephrotic syndrome, acute nephritis, acute nephritis and renal failure; patients with uncontrolled infection, fever and diarrhea; patients with congenital malformation, hereditary metabolic disease, combined with other organ dysfunction and coagulation disorders; patients with allergic or intolerable to perazine ferulate...
Table I. Comparison of total efficiency and the incidence of complications [case (%)].

| Group        | Case | Excellent\(a\) | Effective\(b\) | Ineffective\(c\) | Total effective rate | Secondary infection | Renal function deterioration | Stress ulcer | Complication\(d\) |
|--------------|------|-----------------|----------------|-------------------|----------------------|---------------------|--------------------------|--------------|------------------|
| Observation  | 30   | 9               | 10             | 11                | 19 (63.3)            | 3                   | 5                        | 2            | 10 (33.3)        |
| Control      | 30   | 13              | 13             | 4                 | 26 (86.7)            | 1                   | 2                        | 0            | 3 (10.0)         |
| \(\chi^2\)test |      |                 |                |                   |                      |                     |                           |              | 4.356            |
| P-value      |      |                 |                |                   |                      |                     |                           |              | 0.028            |

\(a\)Excellent, clinical symptoms disappeared and IgA deposition decreased by >90%. \(b\)Effective, clinical symptoms mostly disappeared and IgA deposition decreased by 50-80%. \(c\)Ineffective, clinical symptoms were not improved. \(d\)Complications included IgA secondary hypertension, increased proteinuria, secondary infection, renal function deterioration, and stress ulcer.

Observation indices. The differences of total efficiency, incidence of complication, serum IgA, fibronectin and complement C3 levels of the two groups were compared (Table I).

Detection of serum IgA, fibronectin and complement C3. Venous blood (5 ml) was drawn in the morning and centrifuged at 2,000 x g for 15 min to collect the supernatant for preservation at -80°C. Kits of IgA, fibronectin and complement C3 were purchased from Santa Cruz Biotechnology, Inc. (Santa Cruz, CA, USA). IgA was detected using ELISA and fibronectin and complement C3 were examined by single radial immunodiffusion, according to the supplier instructions.

Statistical analysis. SPSS 19.0 statistical software (SPSS Inc, Chicago, IL, USA) was used for statistical analysis and data were presented as mean ± standard deviation. The comparison between groups was made by an independent sample t-test. Enumeration data were expressed as a percentage. The comparison between groups was made using the \(\chi^2\) test. P<0.05 was considered to indicate a statistically significant difference.

Results

Comparison of total efficiency and the incidence of complications. Twelve patients in the control group underwent expectant treatment and 18 cases underwent hormonal treatment. The total effective rate of the observation group was significantly higher compared to the control group. The incidence of complications was significantly lower compared to the control group (p<0.05).

Comparison of serum IgA, fibronectin and complement C3 levels. Prior to intervention, differences of serum IgA, fibronectin and complement C3 levels of the two groups were not statistically significant (p>0.05). After intervention, the indices of the two groups were improved and serum IgA and fibronectin levels of the observation group were significantly lower than those of the control group. Levels of complement C3 were significantly higher than that of the control group (p<0.05) (Table II).

Discussion

IgA nephropathy is accompanied by deposition of IgA and C3 deposition in kidney tissues. IgA is an important
immunoglobulin that accounts for 15% of the total serum immunoglobulin (6). IgA deposition is parallel to pathological changes of glomerulus. IgA deposition in the mesangial area is accompanied by mesangial proliferation, and IgA deposition in the capillary is accompanied by the changes of blood vessel endothelium (7). Pathological factors that cause IgA deposition include (3,4,7): i) Entrance of an antigen into the body from mucosa to stimulate the IgA immune system. Antigen may be a microorganism or food such as egg albumin, bovine serum albumin, and casein; ii) abnormal IgA immune response results in the formation of poly IgA of high molecular weight; iii) poly IgA that contains antigens combines with fibronectin through static λ chain or receptor FeaR and precipitates in kidney. IgA-fibronectin complex in serum was characteristic of IgA nephropathy; and iv) other IgA removal mechanisms such as liver damage or saturation.

Previous findings showed that IgA that precipitate in glomerulus of IgA nephropathy were mainly poly IgA (8). IgA nephropathy patients showed increased serum IgA1, poly IgA, and λ-IgA1. The lymphoid B cells had β-1 and 33 galactose transferase deficiency, which led to O-type glycosylation of the IgA1 strand area and reduced galactolipin of chain end, which further affected the binding of IgA1 with oligo sialic acid protein receptor ASGPR in liver cells. The affected IgA removal increased the binding of IgA with other kidney tissues, leading to its deposition (9).

IgA nephropathy in western countries is generally treated by hormone or immunosuppressive therapy, which although effective, is prone to recurrence, hormone dependence and related complications, and other side effects (3). In a related study (4) it was identified that, for child patients, conservative treatment was able to receive the same curative effects as hormone or immunosuppressive therapy, which although effective rate, incidence of complications, serum IgA and reduce the recurrence of respiratory tract infections (16).

The results of the present study have shown that the total effective rate, incidence of complications, serum IgA and fibronectin levels, and levels of complement C3 of the observation group were significantly higher compared to the control group. In conclusion, piperazine feraulate tablets combined with eucalyptol-limonene-pinene enteric soft capsule is safe and effective for the treatment of children with IgA nephropathy. It was superior to conservative or hormonal therapy, and thus worthy of clinical promotion.

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