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Analysis of the Effect of Hormone Therapy Combined with Hydroxychloroquine in the Treatment of IgA Nephropathy

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Abstract: *Objective:* To explore and analyze the effect of hormone therapy combined with hydroxychloroquine in the treatment of IgA nephropathy. *Methods:* 30 patients with IgA nephropathy who were admitted to the Urology Department of Jiuquan hospital from August 2021 to May 2023 were selected as the research subjects, and they divided into an observation group and control group by drawing lots, with 15 cases in each group. The observation group underwent hydroxychloroquine treatment in addition of hormone therapy, and the control group underwent conventional treatment and hormone therapy. The rate of effectiveness of treatment, serum index, and renal function of both groups were compared. *Results:* The incidence of adverse reactions in the observation group was significantly lower than that in the control group ($P < 0.05$). There was no significant difference in serum creatinine and serum albumin ($P > 0.05$) between the groups before treatment; after treatment, the serum creatinine and serum albumin in the steroid group were significantly better than those in the reference group ($P < 0.05$). Besides, there was no significant difference in urine protein quantification and glomerular filtration rate between the groups before treatment ($P > 0.05$); after treatment, the hormone group's urine protein quantification and glomerular filtration rate were significantly better than those in the reference group ($P < 0.05$). The rate of effectiveness of the hormone group was significantly higher than that of the reference group ($P < 0.05$). *Conclusion:* Hormone therapy combined with hydroxychloroquine in the treatment of IgA nephropathy is more effective than hormone therapy alone, thus this treatment plan is worthy of promotion and application.

Keywords: Hormone therapy; Hydroxychloroquine; IgA nephropathy

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1. Introduction

IgA nephropathy is a common primary glomerular disease characterized by hematuria and proteinuria [1]. The disease is caused by the precipitation of IgA in the glomerular mesangium, and it is can be induced by intestinal or respiratory infection [2]. Some researchers believe that IgA nephropathy is an autoimmune disease that can be inherited, and it is difficult to treat [3]. Drug therapy is the first choice for this disease, in which hormones are commonly used for the treatment of this disease. It is difficult to guarantee the curative effect through hormone therapy alone, in which some patients' condition could be controlled or even worsened. Therefore, it is necessary to seek new treatment options [4]. A study found that hydroxychloroquine has a certain effect in the treatment of IgA nephropathy, and this drug is widely used in the treatment of autoimmune diseases. Hydroxychloroquine is a biological antimalarial drug and a new type of drug that has a good effect on immune regulation. It can reduce protein levels and urinary protein

and delay the degree of renal damage. If hydroxychloroquine is used in combination with hormones, it can play a synergistic effect and improve the effectiveness of treatment. Therefore, the effect of hormone combined with hydroxychloroquine in the treatment of IgA nephropathy is studied in this paper.

2. General information

Thirty patients with IgA nephropathy who were admitted to the Urology Department of our hospital from August 2021 to May 2023 were selected as the research subjects. They were divided into an observation group and a control group by drawing lots, with 15 cases in each group. In the observation group, there were 7 males and 8 females, ranging from 29 to 71 years old, with an average age of 43.59 ± 2.69 years old; the duration of disease ranged from 5 to 21 months, with an average duration of 13.52 ± 1.57 months. In the control group, there were 9 males and 6 females ranging from 30 to 72 years old, with an average age of 43.87 ± 2.56 years old, the duration of disease ranged from 5 to 22 months, with an average 13.75 ± 1.36 months. There was no statistically significant difference in the general information such as gender, age, and disease duration between the two groups ($P > 0.05$). The informed consent of the patients and their families was obtained, and this studied complied with the regulations of the ethics committee.

Inclusion criteria: (i) diagnosed with IgA nephropathy, (ii) compliant, (iii) no systemic chronic diseases.

Exclusion criteria: (i) allergic to the drugs in this treatment, (ii) pregnant or breastfeeding, (ii) history of mental illness, (iv) has abnormal coagulation function (v) has blood diseases, (vi) has malignant tumors.

3. Methods

The control group underwent conventional treatment and hormone therapy: losartan tablets 50 mg/time, once a day, taken in the morning; the dose can be adjusted according to the condition. The patients also took 0.5mg/(kg/time) prednisone, 1 time/d, orally, after 8 weeks of treatment, and the dosage was reduced by 5mg every two weeks until discontinuation. The treatment lasted for half a year.

Combination of hormone therapy and hydroxychloroquine treatment: hydroxychloroquine sulfate tablets 0.4 g/d, which was taken once or divided into two doses, and the dosage can be increased according to the therapeutic effect. The treatment lasted for half a year.

3.1. Observation indicators

(i) The incidence of adverse reactions of the groups was compared, including pulmonary infection, abnormal liver function, sleep disturbance, and new-onset diabetes.
(ii) Serum indicators of both groups were compared, including serum creatinine and serum albumin.
(iii) The levels of renal function of both groups were compared, including urine protein quantification and glomerular filtration rate.
(iv) The rate of effectiveness of treatment underwent by both groups were compared. Very effective – disappearance of symptoms and all indicators returned to normal levels; effective – improvement in symptoms, and relevant indicators recovered to a certain extent; ineffective – no improvement in symptoms, and all indicators are in an abnormal state.

3.2. Statistical analysis

SPSS 21.0 statistical software was used to process and analyze the data, the count data were expressed by the number of cases (n) and percentage (%); a χ^2 test was performed, and the measurement data were expressed by mean ± standard deviation (SD); t-test was also performed, and $P < 0.05$ was considered statistically significant.

4. Results

4.1. Incidence of adverse reactions

The incidence of adverse reactions in the hormone group was significantly lower than that in the reference group ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of the incidence of adverse reactions between the two groups (*n* [%])

Group	Number of cases	Lung infection	Abnormal liver function	Sleep disorder	New onset diabetes	Total incidence
Observation group	15	0 (0.00)	0 (0.00)	1 (6.67)	0 (0.00)	1 (6.67)
Control group	15	1 (6.67)	2 (13.33)	2 (13.33)	1 (6.67)	6 (40.00)
χ^2	-	-	-	-	-	4.6584
P	-	-	-	-	-	0.0309

4.2. Serum indicators

Before treatment, there was no significant difference in serum creatinine and serum albumin ($P > 0.05$) between the groups; after treatment, serum creatinine and serum albumin in the observation group were significantly better than those in the reference group ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of the serum indicators between the two groups before and after treatment (mean ± SD)

Group	Number of cases	Serum creatinine (μmol/L)		Serum albumin (g/L)	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	15	103.56 ± 45.23	79.58 ± 22.54	37.59 ± 4.22	49.67 ± 5.46
Control group	15	103.89 ± 45.67	96.54 ± 22.49	37.86 ± 4.16	41.55 ± 4.28
t	-	0.0198	2.1845	0.8300	4.5330
P	-	0.9843	0.0375	0.4135	0.0001

4.3. Renal function levels

There was no significant difference in the urine protein quantification and glomerular filtration rate of both groups before treatment ($P > 0.05$); after treatment, the observation group's urine protein quantification and glomerular filtration rate were significantly better than those in the control group, ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of the renal function levels between the two groups before and after treatment (mean ± SD)

Group	Number of cases	Quantitative urine protein (g/24 h)		Glomerular filtration rate (ml/min)	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	15	1.85 ± 0.23	0.75 ± 0.22	77.41 ± 21.59	94.67 ± 24.16
Control group	15	1.84 ± 0.25	1.46 ± 0.31	77.59 ± 21.69	72.55 ± 21.58
t	-	0.1140	7.2338	0.0227	2.6445
P	-	0.9100	0.0000	0.9820	0.0133

4.4. Rate of effectiveness of treatment

The rate of effectives of the treatment underwent by the observation group was significantly higher than that of the control group ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of the rate of effectiveness of the treatment underwent by the two groups (*n* [%])

Group	Number of cases	Very effective	Effective	Ineffective	Total rate of effectiveness
Observation group	15	9 (60.00)	5 (33.33)	1 (6.67)	14 (93.33)
Control group	15	7 (46.67)	1 (6.67)	7 (46.67)	8 (53.33)
χ^2 value	-	-	-	-	6.1364
P	-	-	-	-	0.0132

5. Conclusion

The kidney is an important organ of the urinary system that regulates the body's electrolytes, endocrine, and blood pressure [5]. In recent years, the incidence of kidney disease has been increasing, and IgA nephropathy is a common kidney disease [6-7]. However, the etiology of the disease has not been thoroughly studied, and it is preliminarily believed to be caused by damage of the immune system, and it is a complex disease that is related to genetic factors and other factors [8-9]. IgA nephropathy is mainly manifested by changes in urine properties, accompanied by edema, lower back pain and other symptoms, and it may lead to nephrotic syndrome and renal failure [10-11]. Drug therapy is the main treatment method of IgA nephropathy, and severe renal impairment can be treated with dialysis or kidney transplantation [12-13]. Hormones is the key drug for the treatment of this disease. This drug can inhibit proteinuria and reduce damage to renal function. When the kidney is severely damaged, hormone therapy can no longer achieve the desired effect, and there is a risk of deterioration of the disease [14-15]. Hydroxychloroquine is an antimalarial drug that can reduce the synthesis of cytokines, cut off the activation path of T lymphocytes, and reduce the reproduction of lymphocytes. The drug also reduces the function of lysosomes, which in turn counteracts inflammatory responses and suppresses the activity of the immune system. The efficacy of hydroxychloroquine is very similar to that of chloroquine, but with very low toxicity. It can regulate the body's immune system, reduce the precipitation of IgA in the glomerular mesangial area, reduce the damage to the glomerulus, and restore renal function.

Hormone therapy has many side effects, which can cause infection, high blood pressure, and even induce diabetes. Therefore, the long-term use of hormone therapy is less safe. Therefore, combining hormones with hydroxychloroquine can reduce the amount of hormones used and reduce adverse reactions. After the combined treatment, the condition was effectively controlled, the serum indexes and renal function levels were restored, the clinical symptoms were alleviated, and the effectiveness of treatment was improved.

Hormone therapy combined with hydroxychloroquine in the treatment of patients with IgA nephropathy is highly effective. Hence, this treatment plan should be widely implemented.

Disclosure statement

The author declares no conflict of interest.

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