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Analysis of the Application Effect and Value of Dydrogesterone in The Treatment of Preeclampsia for Fetal Preservation

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Abstract: *Objective:* To analyze the application effect and value of dydrogesterone in the fertility preservation treatment of preeclampsia. *Methods:* Forty cases of patients with preeclampsia admitted to our hospital between January 2023 and January 2024 were divided randomly into a control group and an observation group of 20 cases each. The control group applied progesterone to preserve the fetus, and the observation group applied dydrogesterone. The symptom relief time, hormone levels before and after treatment, as well as adverse drug reactions, and the effect of fetal preservation between the two groups were compared. *Results:* The time to relieve vaginal bleeding, abdominal pain. and lumbago in the observation group was shorter than that in the control group ($P < 0.05$). After treatment, the progesterone levels and incidence of adverse drug reactions in the observation group were lower than those in the control group ($P < 0.05$). The success rate of fertility preservation in the observation group was higher than that in the control group ($P < 0.05$). *Conclusion:* In the treatment of fetal preservation of preeclampsia, the application of dydrogesterone positively alleviated vaginal bleeding, abdominal pain, and lumbago, with mild adverse reactions and a good effect on fetal preservation.

Keywords: Preeclampsia; Fertility preservation treatment; Dydrogesterone; Application effect

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1. Introduction

Preeclampsia is caused by multiple factors, with symptoms of lower back pain, lower abdominal pain, often accompanied by vaginal bleeding. If not treated promptly, abortion might be necessary. Preeclampsia occurs at 4 to 8 weeks of pregnancy [1] and is mainly treated with medication, such as progesterone and dydrogesterone. Progesterone is a natural hormone that can improve endometrial tolerance, reduce uterine contraction spasms, and improve the nutrient supply of the ovum at the time of implantation [2]. It plays a role in fetus preservation, while dydrogesterone stimulates the secretion of hormones from the uterine lining, reduces the symptoms of preeclampsia, and maintains the normal progress of the pregnancy. However, the mechanisms of the two drugs are different. To analyze the effect and value of the application of v in the fertility preservation treatment of preeclampsia, a total of 40 patients were selected as subjects in this study.

2. Information and methods

2.1. Basic information

Forty cases of patients with preeclampsia who were admitted to our hospital from January 2023 to January 2024 were randomly selected and divided into a control group and an observation group of 20 cases each. The control group consisted of patients aged 20–35 years old, with an average age of 27.15 ± 3.36) years. The patients were in gestational weeks of 4–8 weeks, with an average of 6.13 ± 2.22 weeks upon admission. The number of pregnancies was 1–3, with an average of 2.01 ± 0.31. Twelve cases were primigravida and 8 cases were menstruating. The observation group consisted of patients aged 21–36 years old, with an average of 27.42 ± 3.30 years. The patients were in gestational weeks of 4–8 weeks, with an average of 6.25 ± 2.17 weeks upon admission. There were 1–3 cases of pregnancies, with an average of 2.08 ± 0.29 cases. There were 13 cases of primigravid women and 7 cases of menstruating women. Information between the two groups was comparable and not significant ($P > 0.05$).

2.2. Inclusion and exclusion criteria

Inclusion criteria: (1) Patients diagnosed with preeclampsia, abdominal pain, vaginal bleeding, and other related symptoms; (2) cooperated with examinations; (3) compliant with medication; (4) normal cognitive function; (5) complete clinical information data. Exclusion criteria: (1) Patients who have received relevant treatment of preeclampsia in other hospitals before enrollment; (2) diagnosed with ectopic pregnancy or gravidarum; (3) did not comply with medication; (4) dropped out halfway.

2.3. Methods

The control group received progesterone (specification: 50 mg*20 capsules, approval number: State Drug License H20041902, manufacturer: Zhejiang Xianju Pharmaceutical Co.). The capsule (0.1 g) was taken orally, every 12h, for one month. The observation group received dydrogesterone (specification: 10 mg*20 tablets, approval number: HJ20170221, Manufacturer: Abbott Biologicals B.V., Netherlands) treatment. The tablets were taken orally at 10 mg twice a day for one month. The two groups of patients were instructed to pay attention maintain their emotional stability, have sufficient rest, and adopt a reasonable diet during the treatment.

2.4. Observation indexes

The time of symptom relief, including vaginal bleeding, abdominal pain, and lumbago, was compared between the two groups. Hormonal indicators before and after treatment, including human chorionic gonadotropin (HCG), estradiol, and progesterone were measured by collecting 3 mL of fasting elbow vein blood, which was then centrifuged and processed. The upper layer of serum was extracted, and the levels of the above three indicators were determined by the chemiluminescence method. The adverse drug reactions and the success rate of fetal preservation in the two groups were also compared.

2.5. Statistical methods

The data were analyzed by the SPSS version 25.0 statistical software. The measurement data conformed to a normal distribution and were expressed as mean ± standard deviation and the count data were expressed as %. Measurement data were analyzed using a *t*-test, and count data were analyzed using a chi-squared (χ^2) test. Results were considered statistically significant at $P < 0.05$.

3. Results

3.1. Symptom relief time

As shown in **Table 1**, the relief time of vaginal bleeding, abdominal pain, and lower back pain of patients in the observation group was shorter than that of patients in the control group ($P < 0.05$).

Table 1. Symptom relief time between the two groups (mean ± standard deviation, h)

Group	Cases, *n*	Vaginal bleeding	Abdominal pain	Lumbago
Control group	20	43.13 ± **3.35**	39.13 ± **4.16**	55.18 ± **4.12**
Observation Group	20	40.15 ± **3.08**	32.27 ± **4.24**	52.13 ± **3.39**
t	-	2.929	5.165	2.557
P	-	0.006	0.000	0.015

3.2. Hormone index levels

As shown in **Table 2**, there was little difference in the levels of hormone indexes between the two groups of patients before treatment ($P > 0.05$). After treatment, the difference in the levels of HCG and estradiol in the observation group was not obvious ($P > 0.05$), and the levels of progesterone in both groups were higher than those before treatment. The level of progesterone in the observation group was lower than that of the control group after treatment ($P < 0.05$).

Table 2. Hormone index levels between the two groups before and after treatment (mean ± standard deviation)

Group	Cases, *n*	HCG (mIU/mL)		Estradiol (pg/mL)		Progesterone (nmol/L)	
		Pre-Treatment	Post-Treatment	Pre-Treatment	Post-Treatment	Pre-Treatment	Post-Treatment
Control group	20	3213.52 ± 985.20	3210.85 ± 917.45	705.45 ± 135.63	720.45 ± 311.17	23.41 ± 3.62	32.15 ± 3.18
Observation group	20	3224.85 ± 976.27	3281.45 ± 902.97	706.18 ± 133.47	717.85 ± 305.39	23.30 ± 3.54	28.15 ± 2.26
t	-	0.037	0.245	0.017	0.027	0.097	4.585
P	-	0.971	0.808	0.986	0.979	0.923	0.000

3.3. Adverse drug reactions and fetal preservation effect

As shown in **Table 3**, the incidence of adverse drug reactions in the observation group was lower than that in the control group, and the success rate of fetal preservation was higher than that in the control group ($P < 0.05$).

Table 3. Incidence of adverse drug reactions and effect of fetal preservation between the two groups [*n* (%)]

Group	Cases, *n*	Spinning	Vomiting	Pruritus	Breast swelling and pain	Adverse reactions	Successful birth control
Control group	20	1 (5.00)	1 (5.00)	2 (10.00)	2 (10.00)	6 (30.00)	14 (70.00)
Observation group	20	0 (0.00)	0 (0.00)	0 (0.00)	1 (5.00)	1 (5.00)	19 (95.00)
χ^2	-	-	-	-	-	4.329	4.329
P	-	-	-	-	-	0.037	0.037

4. Discussion

Preeclampsia is associated with symptoms such as abdominal pain, lumbago, and vaginal bleeding. Unintended pregnancy is characterized by a closed pelvis, no pregnancy discharge, intact fetal membranes, and a normal uterus size. This occurrence is frequently observed in obstetrics and gynecology. There are many causative factors of preeclampsia, such as embryo abnormality, gynecological inflammation, placental viral infection, and maternal malnutrition [3]. Vomiting is a common symptom in early pregnancy, including poor appetite, vomiting after eating, and malnutrition problems, which are not conducive to the development of the embryo. In serious situations, it may lead to miscarriage. The emotional state of pregnant women is also related to miscarriage. Some pregnant women are extremely unstable after pregnancy. These unstable emotions will affect the activity of the cerebral cortex, resulting in uterine contractions, and the embryo is forced to be expelled, which may also lead to intrauterine fetal death [4]. In addition, some acute infectious diseases are also a cause of miscarriage, such as rubella and influenza [5]. Vaginal bleeding is usually minimal, persistent, and irregular. When it occurs before the third trimester, it is crucial to immediately determine the cause and start symptomatic treatment. Furthermore, when vaginal bleeding is accompanied by abdominal pain, it is necessary to be vigilant about preeclampsia, and the pain is normally dominated by abdominal, lumbar, lower back, and pelvic pain, which usually occurs a few hours or a few days after the vaginal bleeding.

Clinical treatment of preeclampsia commonly involves drugs such as progesterone and dydrogesterone. Progesterone can promote the continuation of normal development of the embryo, and the inhibition of the uterine smooth muscle contraction so that uterine tension can be reduced. Progesterone belongs to steroid hormones, which are secreted by the ovary, placenta, and adrenal glands. When there is sufficient estrogen, progesterone will promote the transformation of the endometrium to the secretory phase to promote the normal implantation of the fertilized egg [6]. Both hormones then work together to maintain a normal pregnancy. However, if progesterone is used for a long period, it may cause adverse reactions, reduce patient tolerance, and then affect the therapeutic outcome. Dydrogesterone is beneficial for the endometrium to enter the stage of complete secretion [7]. It prevents the endometrium from proliferation or cancer due to the rise in estrogen levels, and it does not affect lipid metabolism, androgen and estrogen, and adrenocorticotropic hormone levels [8]. It can also induce the synthesis of luteinizing hormone (LH) by lymphocytes, inhibit the secretion of inflammatory mediators, maintain the endometrium in a stable state, and promote the relaxation of the uterine myometrium. Furthermore, it has high bioavailability, regulates immunity, and promotes the continuous development of the embryo [9]. A total of 40 cases of patients with preeclampsia were included in this study. The control group received progesterone while the observation received dydrogesterone for fetus preservation. Results showed that the observation group had earlier relief of each symptom, fewer adverse reactions to the drug, and a higher success rate of preservation of the fetus as compared to the control group. In terms of the hormone level, HCG, secreted by placental chorionic trophoblasts and beneficial to the luteal body growth, can increase the level of estrogen and promote the development of the placenta. Estradiol is secreted by the corpus luteum, and its level increases along with the gestational week, which can nourish cells and promote the development of the embryo [10]. Progesterone is a very important hormone throughout pregnancy, which is secreted by the corpus luteum and the trophoblast in the early stage of pregnancy. It is then supplied by the placenta after the eighth week of gestation [11]. This study showed that the levels of HCG and estradiol in both groups before and after treatment did not differ significantly. The progesterone levels of both groups increased after treatment, but the increase in the observation group was smaller, indicating that progesterone had a greater effect on progesterone levels. However, it was found that progesterone has a certain effect on the progesterone test results, which may lead to a false elevation of the hormone [12]. Dydrogesterone belongs to the reversal of the spinose natural progesterone,

which does not affect the results of progesterone detection [13]. Hence, the detected progesterone is accurate. The control group's progesterone level after treatment was higher than that of the observation group, which should be an artifactual elevation. The reason for fewer adverse effects in the observation group is that dydrogesterone is a synthetic progestin, which has a higher purity and is more easily absorbed, so it has fewer adverse effects.

5. Conclusion

The application of dydrogesterone in the fertility preservation treatment of preeclampsia is recommended because it has a more favorable effect and fewer adverse effects. Meanwhile, during fertility preservation, it is also necessary to control emotions, increase rest, take vitamin supplements, and consume a light and nutritious diet to further improve the fertility preservation success rate in preeclampsia.

Disclosure statement

The author declares no conflict of interest.

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