

Analysis of a Study of Nifedipine Sustained-release Tablets Combined with Magnesium Sulfate in the Treatment of Hypertension during Pregnancy

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Abstract: This paper aims to analyze the effect of nifedipine sustained-release tablets combined with magnesium sulfate in the treatment of hypertension during pregnancy. A total of 60 pregnant women with hypertension during pregnancy admitted to our hospital in the year from 2021 to 2022 were selected as research subjects, and they were evenly divided into control group and observation group, 30 cases in the control group according to the random group, and the two groups were treated with conventional treatment, in which the control group was treated with magnesium sulfate alone, and the observation group was treated with nifedipine sustained-release tablets combined with magnesium sulfate on the basis of the control group. The outcomes after completion of different treatments in the two groups were analysed and summarised. The two groups of pregnant women with hypertension achieved certain results after two different treatment methods, but by observing the maternal blood pressure level, maternal delivery outcome, neonatal score (Apgar) and postpartum hemorrhage of the mother, the delivery success rate and neonatal score of the observation group were significantly higher than those in the control group, and the blood pressure level and postpartum hemorrhage of the observation group were significantly lower than those in the control group, and the differences were statistically significant ($P < 0.05$). The clinical application of nifedipine sustained-release tablets combined with magnesium sulfate in the treatment of hypertension during pregnancy can effectively improve the pregnancy outcome of women and newborns, effectively improve the therapeutic effect of hypertension during pregnancy, control maternal blood pressure level, and reduce postpartum hemorrhage, which has high clinical application value and is worthy of promotion.

Keywords: Nifedipine sustained-release tablets; Magnesium sulfate; Hypertension during pregnancy

1. Introduction

Hypertension during pregnancy is a unique disease of women during pregnancy, and also refers to the occurrence of hypertension, edema and proteinuria in the 24th week of pregnancy, and in severe cases, dizziness, tinnitus, headache, convulsions and other symptoms will occur, but the medical research on the etiology of hypertension during pregnancy has not yet been clarified, and the disease has attracted extensive attention from the medical community and obstetrics. Hypertension during pregnancy is also one of the main causes of maternal and fetal death, most of the hypertension during pregnancy is accompanied by their own immune imbalance, lack of nutrition, psychological unstable emotions lead to stress and other factors, and most of the outbreaks are new mothers, the incidence rate is more extensive especially in spring, such as not timely treatment of the mother, it is easy to cause the life of the mother and the fetus, to the mother's family brought a serious mental burden, Therefore, effective treatment is essential for women with hypertension during pregnancy^[1]. Common treatments for hypertension in pregnancy include conservative treatment, drug therapy and surgical treatment, of which drug therapy mainly reduces the incidence of hypertensive disorders during pregnancy by improving maternal blood pressure level, improving maternal coagulation function and prethrombotic state, while magnesium sulfate can effectively relieve the negative emotional and anxious mental state of the mother, and avoid and control the occurrence of eclampsia^[2]. However, the use of magnesium sulfate is accompanied by adverse events, and irregular medication or dosage can also lead to maternal complications, resulting in exacerbation of the disease^[3]. In this study, the clinical application effect of nifedipine sustained-release tablets combined with magnesium sulfate in the treatment of hypertension during pregnancy was analyzed, and the specific studies are as follows:

2. Information and methodology

2.1. General information

60 pregnant women with hypertension during pregnancy admitted to our hospital in the year from 2021 to 2022 were selected as research objects, and they were divided into control group and observation group according to the random number method, with 30 cases in each group, of which the control group included 20 cases of nulliparous women and 10 cases of multiparous women; Age 26~44 years old, average age (29.34±4.67) years; The gestational week is 32~38 weeks, and the average gestational age is (36.67±1.64) weeks. There were 22 cases of nulliparous women and 8 cases of multiparous women in the observation group; Age 28~43 years old, average age (29.87±4.95) years; The gestational week is 30~40 weeks, and the average gestational age is (37.02±1.87) weeks. After analysis of the general data of the two groups, the difference was not statistically significant ($P>0.05$) and comparable. All women are informed and consented, and our ethics committee is informed and consents to the study.

2.2. Methods

All women with hypertension during pregnancy required other tests such as weight, blood routine, urine routine, liver and kidney function measurement, and injury hemodynamic testing after admission, and conventional treatment was implemented in both groups. The control group was treated with magnesium sulfate, and the observation group was treated with nifedipine sustained-release tablets combined with magnesium sulfate on the basis of the control group, and the specific implementation methods were as follows:

(1) The control group was treated with magnesium sulfate: medical staff needed to use magnesium sulfate injection for patients (Hebei Tiancheng Pharmaceutical Co., Ltd.; H20033860) for treatment, the specification of magnesium sulfate injection is 10ml: 2.5g. When injecting women for the first time, it should be noted that the optimal dose is 2.5-4g, and magnesium sulfate should be diluted to 20ml with 25% concentration glucose injection before injection, and then slowly injected into the mother, which took 5min; After the end of the injection, 30ml of magnesium sulfate and 500ml of glucose injection with a concentration of 10% are diluted again, and the pregnant woman is intravenously instilled with diluted magnesium sulfate, maintaining 1-2g per hour, it should be noted that the dosage of magnesium sulfate within 24 hours is strictly prohibited to exceed 30g, if necessary, the dosage can be adjusted according to the specific situation of the mother, and the whole process needs to pay close attention to the mother's blood pressure level and other indicators.

(2) The observation group used nifedipine sustained-release tablets combined with magnesium sulfate treatment: the same control group used magnesium sulfate treatment method, it is necessary to first use intravenous injection for the mother, and then intravenous drip at a dosage of 1-2g per hour after 5min, the dosage within 24 hours does not exceed 30g, and the dosage is adjusted according to the condition of the mother if necessary; In addition, it is also necessary to use nifedipine sustained-release tablets (Zhejiang Telison Pharmaceutical Co., Ltd., Sinopharm H19991088) for treatment, each time take 30mg, 1 day / time, mothers need to take whole capsules when taking orally, not chewing and taking, but can be taken with a small amount of liquid and the time of taking the drug does not conflict with the meal time. If necessary, the dose can be adjusted according to the clinical condition of the mother.

(3) Treatment precautions: after medication, the two groups of women need to be tested and checked for various indicators, and close attention should be paid to whether there are adverse reactions in the mothers, and the women who have adverse reactions should stop the drug or reduce the dosage in time; It is necessary to communicate with the mother in time about the possible side effects of drug treatment, to avoid the aggravation of the condition caused by the fear and anxiety of the mother due to the uncertainty of the condition and the resistance to drug treatment, and in the case of negative emotions, the nursing staff should provide guidance and comfort to the mother as soon as possible to help them adjust their mentality and avoid the risk of anxiety; Drug treatment requires a large intake of nutrients, and it is necessary to provide high-vitamin foods on the mother's diet to maintain nutritional balance and enhance immunity, and maternal intake of high-calorie, high-fat and other foods should be avoided to avoid the instability of blood pressure levels; It is necessary to ensure that the mother has enough sleep, to ensure that the combination of work and rest can promote the body's blood circulation through aerobic exercise, but avoid excessive exercise and cause physical discomfort.

After confirmation, the treatment course of both groups of women was 3 days, and the mother's blood routine, urine routine, liver and kidney function measurement and other indicators should be checked again at the end of treatment.

2.3. Efficacy criteria

This review looked at blood pressure levels, maternal delivery outcomes, neonatal (Apgar) scores, and postpartum haemorrhage in both groups.

(1) The maternal blood pressure level should be evaluated by the data recording of diastolic and systolic blood pressure.

(2) Maternal delivery outcomes were evaluated by observing the number of successful delivery cases, the number of failed birth cases, and the success rate of delivery. Labor success rate = number of successful delivery cases / total number of cases.

(3) The neonatal Apgar score is 10 points, the higher the score, the better the health of the newborn.

(4) The amount of postpartum hemorrhage of women is based on the real statistics and records of the data of the two groups of women after different treatment effects.

2.4. Statistical methods

All data of this study were included in the SPSS23.0 software for comparative analysis, and the tests of counting data and measurement data were performed with χ^2 and t, respectively, expressed as percentage (%) and (mean \pm standard deviation), respectively, if the difference in ($P < 0.05$) was statistically significant.

3. Results

3.1. Comparison of maternal blood pressure levels between the two groups

By observing the diastolic blood pressure and systolic blood pressure of the two groups, it can be concluded that the diastolic and systolic blood pressure of the observation group are lower than those in the control group, and the blood pressure level of the observation group is significantly more stable than that of the control group, and the difference is significant ($P < 0.05$), see Table 1:

Table 1: Comparison of blood pressure levels of the two groups ($\bar{x} \pm s$)

Groups	Number of cases	Diastolic blood pressure(mmHg)	Systolic blood pressure(mmHg)
Observation group	30	82.41 \pm 4.25	124.69 \pm 13.77
Control group	30	98.34 \pm 6.31	169.35 \pm 16.24
t	-	11.469	11.489
P	-	0.001	0.001

3.2. Comparison of the success rates of the two groups of women

According to the comparison of the outcomes of delivery after different treatment modalities between the two groups, the success rate of delivery in the observation group was significantly higher than that in the control group, and the difference was significant ($P < 0.05$), as shown in Table 2:

Table 2: Comparison of delivery success rate between the two groups [n,(%)]

Groups	Number of cases	Number of successful deliveries	Number of failed deliveries	Success rate of delivery
Observation group	30	28	2	93.33%
Control group	30	20	10	66.67%
χ^2	-			23.254
P	-			0.001

3.3. Comparison of neonatal Apgar scores between the two groups

According to the neonatal Apgar score of the observation group compared with the neonatal Apgar score of the control group, the neonatal Apgar score of the observation group was significantly higher than that of the control group, and the difference was significant ($P < 0.05$), as shown in Table 3.

Table 3: Comparison of Apgar scores of two groups

Groups	Number of cases	Newborn Apgar score (points)
Observation group	30	9.45±0.62
Control group	30	8.16±0.47
t	-	9.082
P	-	0.001

3.4. Comparison of postpartum hemorrhage in the two groups

After different treatment methods for the two groups, according to the amount of postpartum hemorrhage in the observation group compared with the postpartum hemorrhage in the control group, the postpartum hemorrhage in the observation group was significantly lower than that in the control group, and the difference was significant ($P < 0.05$), see Table 4.

Table 4: Comparison of postpartum hemorrhage in the two groups ($\bar{x} \pm s$)

Groups	Number of cases	The amount of maternal postpartum bleeding(ml)
Observation group	30	19.21±4.36
Control group	30	28.27±5.64
t	-	6.961
P	-	0.001

4. Discussion

Hypertensive disorders during pregnancy are more serious pregnancy complications, which are unique to pregnant women and obstetric diseases that seriously endanger maternal life safety [4]. Its existence is often accompanied by headache, dizziness, blurred vision, decreased urine output and systemic edema and other symptoms, severe cases will also produce pleural effusion, ascites, pulmonary edema, heart failure and placental abruption and other symptoms, in addition, about 9.4% ~ 10.4% of pregnant women in China have gestational hypertension disease, one of the main causes of death of pregnant women is caused by gestational hypertension. Medically, gestational hypertension is divided into preeclampsia and eclampsia, of which the diagnostic criteria for mild preeclampsia are systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg, and women with preeclampsia are usually negative for urine protein, but systolic and diastolic blood pressure will return to normal after 12 weeks, and some women have abdominal pain or thrombocytopenia in blood routine indicators [5], but women with mild preeclampsia can help maintain blood pressure levels after effective treatment; Women with severe preeclampsia will have a systolic blood pressure \geq of 140 mmHg or diastolic blood pressure ≥ 90 mmHg after the 20th week of pregnancy, accompanied by a proteinuria \geq of 0.3 g/24 hours, which is positive, and women with pre-baryoeclampsia will cause a continuous increase in blood pressure index and urine protein index in the body [6], and accompanied by persistent headache, persistent epigastric discomfort, and abnormal liver function, which may also lead to maternal liver function, Renal insufficiency leads to risks such as complications in the fetus; Eclampsia is accompanied by spontaneous maternal convulsions and other symptoms on the basis of preeclampsia, and usually eclampsia seizures can lead to maternal blood pressure instability, and even endanger the life of the mother and fetus [7]. In addition, the cause of maternal hypertension during pregnancy is closely related to the following factors, among which the imbalance of the immune system will lead to a decrease in the immune function of the mother, so that the virus invades the mother and causes infection, or the efficiency of antibody production in the mother is not enough to resist the invading virus, which affects the mother and causes preeclampsia; Vascular endothelial cell activation and damage are the key to the onset of the disease, and abnormal coagulation function will seriously affect the amount of postpartum hemorrhage in the mother, and postpartum hemorrhage will lead to the life of the mother; Maternal psychological anxiety and expulsion is also the main factor of the disease, maternal mood is also indirectly implicated in appetite and nutritional intake, maternal nutrition

imbalance will also implicate fetal nutrition [8], too little nutrition in amniotic fluid fetal cannot be absorbed will cause fetal growth restriction, nutritional deficiency will also lead to the mother's lack of calcium, magnesium, zinc and other elements, resulting in fragile blood vessel walls, also affect the decline of immune function. The method of diagnosing gestational hypertension is mainly through the determination of blood pressure level, of which the blood pressure level of mild gestational hypertension is more than 140/90mmHg, and the maternal part of this degree will be accompanied by edema and mild proteinuria; The blood pressure level of moderate hypertension in pregnancy is determined by blood pressure above 150/100mmHg, and women with this degree will increase the symptoms of dizziness; The blood pressure level of severe gestational hypertension is blood pressure as high as 160/110mmHg or more, severe need medical staff attention, this degree of maternal coma and convulsions symptoms, may be life-threatening. Therefore, effective treatment is essential to ensure maternal safety, improve the success rate of delivery [9], and maintain maternal blood pressure levels.

The conventional treatment for women with hypertension during pregnancy is the use of magnesium sulfate, and the main effect of magnesium sulfate injection is to use sedative, antispasmodic and antihypertensive effects to help women avoid preeclampsia, maintain blood pressure, and help women give birth smoothly. However, the use of magnesium sulfate has some adverse reactions, such as the maternal injection may have physical discomfort, nausea, dizziness and even nystagmus symptoms, for renal insufficiency of women who do not control the dosage in time will lead to the risk of respiratory arrest, severe and even cardiac arrest, for the maternal fetus will also affect the fetal breathing because of the free penetration of magnesium ions into the placenta, such adverse reactions are clinically limited, nifedipine sustained-release tablets can just synthesize the adverse reactions of magnesium sulfate. Nifedipine sustained-release tablets were originally used for the treatment of patients with hypertension, and are also suitable for hypertension during pregnancy, and its use can effectively help pregnant women with hypertension during pregnancy to suppress blood pressure levels [10], by antagonizing calcium channels, making peripheral resistance vasodilation, so that blood pressure is reduced. Nifedipine sustained-release tablets combined with magnesium sulfate treatment can effectively improve maternal systemic edema, and promote blood pressure circulation in the body, improve coagulation function [11], reduce postpartum hemorrhage, and also help the mother's nutrition to maintain balance, enhance the body's immunity, and at the same time enable the fetus to fully absorb nutrients, reduce the possibility of postpartum fetal respiratory inhibition, and improve the score of newborns. The combination of the two agents also improves maternal blood pressure levels and maintains normal levels, while reducing proteinuria index, reducing maternal risk, and improving delivery outcomes [12]. In view of this link combined with this study, it can be concluded that the diastolic blood pressure and systolic blood pressure of the observation group are significantly lower than that of the control group, indicating that nifedipine sustained-release tablets combined with magnesium sulfate treatment can effectively reduce the blood pressure level of women and maintain stability, effectively improving the treatment effect of women. The delivery success rate of the observation group was significantly higher than that of the control group, and nifedipine sustained-release tablets combined with magnesium sulfate treatment could help women deliver successfully and reduce the incidence of complications and ensure the life safety of women. The neonatal Apgar score in the observation group was significantly higher than that in the control group, and it could be concluded that nifedipine sustained-release tablets combined with magnesium sulfate treatment provided certain nutrition for the fetus, improved the survival rate and birth rate of the fetus, and reduced the incidence of respiratory depression. The amount of postpartum hemorrhage in the observation group was significantly lower than that in the control group, which also fully showed that nifedipine sustained-release tablets combined with magnesium sulfate treatment effectively helped women improve the success rate of delivery, reduce postpartum hemorrhage, reduce mortality, and improve the treatment effect.

In summary, the clinical application of nifedipine sustained-release tablets combined with magnesium sulfate in the treatment of hypertension during pregnancy has a significant effect, which can reduce the risk of childbirth, reduce maternal and infant mortality, effectively improve the survival rate of mother and baby, reduce the incidence of neonatal complications, stabilize maternal blood pressure level, reduce postpartum bleeding, have important clinical application value, and have high safety, which is worth promoting.

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complications and complications such as pregnancy induced hypertension and pregnancy induced diabetes.

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