

Effect of Vitamin B6 and Acupressure on Vomiting Symptoms in Pregnant Women with Hyperemesis Gravidarum

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Abstract: Introduction: Hyperemesis Gravidarum (HG) is a common early pregnancy syndrome that usually occurs around 6 weeks of pregnancy. The patient may cause dehydration, electrolyte metabolism disorders and abnormal fat metabolism, causing increased risk of pregnancy-induced. Objective: The effects of vitamin B and acupressure application combined with psychological adjuvant therapy on vomiting symptoms and mental health in pregnant women with severe vomiting. Methods: *Study Type:* Randomized Control Trial *Duration of Study:* Twelve Months from January 2019 to December 2019 *Sampling Technique:* The data has been collected from the subject index coming to the gynecology OPD of Gulab Devi Teaching Hospital, Lahore, Pakistan. Control group: aged 20 to 37 years, with an average of (26.12±2.44) years; 8 to 17 weeks of gestation, with an average of (9.18±1.77) weeks. *Sample Selection Inclusion Criteria:* All persons who have 1) meet the diagnostic criteria for HG; 2) 20 to 40 years of age; 3) both signed informed consent. *Exclusion Criteria:* vomiting caused by medical diseases such as hydatidiform mole, gastrointestinal disease, viral hepatitis, cholecystitis. This study was approved by the Medical Ethics Committee of Gulab Devi Teaching hospital. Pregnant women who were enrolled were divided into control group and experimental group according to the random number table method, with 48 cases in each group. *Study Tools:* Questionnaire and Interview *Sample size* (n)=96. Results: After 7 days of treatment the effective percentage rate in the experimental group was higher as compare to the control group in terms of clinical efficacy, SAS and SDS scores, antiemetic and hospitalization time and cost was much lower and within limits in the experimental group as compare to control group. Discussion: In addition to physiological treatment such as fluid replacement, psychological treatment should not be ignored. Conclusion: vitamin B6 and acupressure application combined with psychological adjunctive treatment of HG had a significant effect and could significantly relieve pregnant women Anxiety, depression and promote the recovery of pregnant women.

Keywords: Hyperemesis Gravidarum, VitaminB6, Acupressure Application, Psychological Adjuvant Therapy

1. Introduction

Hyperemesis Gravidarum (HG) is a common early pregnancy syndrome that usually occurs around 6 weeks of pregnancy. The main symptoms are frequent nausea, vomiting and inability to eat. Usually, the symptoms resolve naturally after 12 weeks of pregnancy, but some pregnant women continue to have severe early pregnancy reactions i.e. nausea and vomiting can last for a long time. The patient may cause dehydration, electrolyte metabolism disorders and abnormal fat metabolism, causing liver and kidney damage and increased risk of pregnancy-induced hypertension can even cause Wernicke's disease and endanger the life of pregnant women. The incidence of HG is 0.5% to 2.0%. If it is not treated in time or is not treated well, it will seriously endanger the health of pregnant women and fetuses [1]. Its etiology is unknown until now. It is generally believed that its occurrence is closely related to chorionic gonadotropin (hCG), increased estrogen expression, helicobacter pylori infection and mental factors in pregnancy [2]. The disease is a self-limiting disease. There are no effective treatments at present. The Physician treats symptomatic treatment with fluid replacement, antiemetic, sedation, etc., but the onset is slow and the effect is poor. The physician has gradually shown unique advantages in treating HG. Studies have shown that, acupressure application can play a role in reducing inversion and vomiting, fundamentally eliminate the HG pathogenic factors and combined with rehydration can effectively alleviate a series of symptoms caused by HG [3].

2. Background

In recent years, the role of mental and psychological factors in the occurrence and development of HG has caused widespread clinical concern. More and more medical researchers have pointed out that HG is a physiological and psychological disease. The study found, HG occurred in the spirit of high tension, mood swings of early maternal or advanced maternal age [4]. Adlan et al. research showed that the mental health of pregnant women with HG is at a low level and early psychological intervention should be given to promote symptom relief [5]. Gadsby et al. research showed that HG pregnant women have moderate levels of anxiety and psychological stress, which interact with vomiting symptoms [6]. It is of great significance to intervene in the adverse mental state of pregnant women with HG. Ostenfeld et al. combined conventional drugs with psychological treatment for HG, effectively promoted the relief of pregnant women's condition [7]. McParlin et al. found that psychological treatment can effectively reduce the anxiety and depression of pregnant women with HG and improve the treatment effect [8]. The search for effective treatments to

help pregnant women relieve vomiting is a hot topic in gynecological research.

3. Objective of the Study

To observe the effects of vitamin B and acupressure application combined with psychological adjuvant therapy on vomiting symptoms and mental health in pregnant women with severe vomiting, with a view to providing a theoretical reference for clinical treatment.

4. Materials and Methods

4.1. Materials

Study Type: Randomized Control Trial

Settings: This study has been conducted in Gulab Devi Teaching Hospital, Lahore, Pakistan.

Duration of Study: Twelve Months from January 2019 to December 2019

Sampling Technique: The data has been collected from the subject index coming to the gynecology OPD of Gulab Devi Teaching Hospital, Lahore, Pakistan through random number table method which were further divided into experimental group and the control group.

Control group: aged 20 to 37 years, with an average of (26.12 ± 2.44) years; 8 to 17 weeks of gestation, with an average of (9.18 ± 1.77) weeks; 2 to 17 days of disease, with an average (13.44 ± 3.65) d; 33 cases of first trimester 15 pregnancies; Level of education: 13 cases of matric and below, 23 cases of intermediate, 12 cases of graduation and above. Lab Test analysis reports: urine ketone body (2.08 ± 0.62) mmol / L; serum potassium (3.63 ± 0.34) mmol / L.

Experimental group: ages 20 to 38 years, average (26.74 ± 2.61) years; 6-17 weeks of gestation, average (9.55 ± 1.43) weeks; duration of disease 2 to 17 days, average (12.86 ± 3.58) days; 31 cases of first trimester, There were 17 cases of menstrual pregnancy; culture level: 11 cases of matric and below, 25 cases of intermediate, 12 cases of graduation and above. Lab Test Analysis: urinary ketone body (2.11 ± 0.53) mmol / L; serum potassium (3.58 ± 0.45) mmol / L.

Sample Selection

Inclusion Criteria: All persons who have 1) meet the diagnostic criteria for HG in the "Obstetrics and Gynecology" (5th edition) [9]; 2) TCM syndrome is weak in the spleen and stomach; 3) 20 to 40 years of age; 4) normal cognition and basic communication and understanding ability; both signed informed consent.

Exclusion Criteria: 1) vomiting caused by medical diseases such as hydatidiform mole, gastrointestinal disease, viral hepatitis, cholecystitis; 2) history of previous mental illness; 3) poor compliance, unable to cooperate with treatment or evaluation; 4)

heart, liver, kidney, etc. Patients with severe organ abnormalities; 5) Pregnancy complications, complications such as threatened abortion, placenta previa and hypertension; 6) those who are not suitable for the treatment of this trial.

Study Tools: Questionnaire and Interview

Sample size (n)=96

The total numbers of participants were 96 which included 96 females which further divided in to 2 groups from control group and experimental group, each group consist of 48 pregnant females.

4.2. Methods

4.2.1. Control Group

1. General treatment: The patients were advised to eat a light diet and vitamin-rich foods, when the nausea and vomiting are very serious, pay attention to rest and ensure good sleep;
2. Fluid replacement therapy: 5% ~ 10% glucose injection or Green's solution and adding 2 ~ 3g of vitamin C, intravenous drip, the total daily rehydration is determined by the specific symptoms of pregnant women, generally does not exceed 3500ml; according to the electrolyte results. Daily potassium supplementation 3 ~ 4g, 15 ~ 20ml of 10% potassium chloride injection can be given; for those with metabolic acidosis. If the blood gas analysis results show that the CO_2 binding force is $< 18\text{mmol/L}$, an appropriate amount can be supplemented with 5% sodium bicarbonate injection. For severe dehydration patients should be rehydration quickly then the amount of fluid replenishment should be increased on the first day and then the amount of fluid replenishment should be adjusted according to the specific conditions of pregnant woman's vomiting and diet. Stop using antiemetic and sedative drugs during treatment. Take 7 days as a course of treatment until discharged.

4.2.2. Experimental Group: The Following Treatments Were Recommended to the Experimental Group on the Basis of the Control Group

1. Vitamin B6 was added intravenously during rehydration;
2. Acupressure application was performed with 15g each of Amomum Villosum and sage leaves, ground into powder and prepared into a paste by ginger juice for use; Acupressure of the forearm on both sides and in the abdomen. Apply an appropriate amount of the pasty medicine to the selected acupressure, once a day and retain it for 4 hours, taking 7 days as a course of treatment until discharged;
3. Psychological treatment, by professional psychotherapists, attending physicians and nurses of obstetrics and gynecology departments participated and adopted a combination of collective and individualized methods for psychological treatment.

Collective psychological treatment: Psychological treatment for HG pregnant women who are hospitalized were educate on HG health, such as the causes, symptoms, treatment methods, focus of care and the impact of

psychological conditions. Pregnant women recognize that HG is a common symptom during pregnancy and advise the importance of maintaining a good mood. There is no need to worry too much about HG's condition and adverse emotions.

Individualized psychotherapy: The professional psychotherapist, the attending physician of the obstetrics and gynecology department and the nurse of the obstetrics have participated in the initial communication with the pregnant woman. Close doctor-patient relationship have gain trust and define the treatment goals, listen, empathize and understood the suffering of pregnant women. The gynecologist and the nursing staff guided pregnant women to express their needs, vent their negative emotions and reduce mental pain. The gynecologist and the nursing staff guided pregnant women to take effective approaches to seek psychological comfort, such as communicating with each other and encouraging each other, giving phone calls to relatives and friends to talk about distress etc. The nursing staff guided them to experience the joy of life and feel life on the positive side, gave encouragement, showed support, help persist, help build a healthy psychological state, strengthen confidence in healing, maintain a positive response and improve its compliance with treatment. Psychotherapists evaluated the psychological condition of pregnant women daily and adjusted the treatment plan in a timely and targeted manner, once a day, each 30 to 40 minutes, with 7 days as a course of treatment until discharged.

4.2.3. Observation Indicators

1. The patients were scored for nausea and vomiting, fatigue, dizziness and other symptoms before and after 7 days of treatment, with a score of 1, 2 and 3 for mild, moderate and severe;
2. Before and after treatment, respectively Seven days later, the self-rating anxiety scale (SAS) and self-rating depression scale were used to evaluate the anxiety and depression of pregnant women. The SAS and SDS scales each contain 20 items and the scores are graded according to the frequency of symptoms. (1 point), a small amount of time (2 points), more time (3 points), most of the time or always (4 points);

Anxiety level evaluation criteria: SAS score of 51 ~ 60 points indicates mild anxiety, 61 ~ 70 points indicate moderate anxiety ≥ 71 points indicate severe anxiety;

Evaluation criteria for the degree of depression: SDS scores 51 to 60 indicate mild depression, 61 to 70 points indicate moderate depression and ≥ 71 points indicate severe depression;

3. Record two Group antiemetic time, discharge time and hospitalization cost;
4. Observe the occurrence of adverse reactions in treatment.

4.2.4. Efficacy Evaluation

Efficacy was evaluated 7 days after admission to the hospital and the evaluation criteria were formulated and found markedly effective. The symptoms of nausea and vomiting disappeared or occasional and normal eating was achieved. All biochemical indicators were significantly improved and the urine, ketone body turned negative.

Effectiveness of the treatment: The symptoms of nausea and vomiting were significant Remission, appetite improvement, various biochemical indicators improved. The urinary and ketone bodies decreased;

Ineffectiveness in the control group: nausea and vomiting symptoms did not improve significantly and eating difficulty was greater, all biochemical indicators did not improve or worsened, urinary ketone bodies continued to be positive.

Total effective rate=obvious efficiency + effective rate.

4.3. Statistical Processing

SPSS 24.0 software was used to complete the analysis. Measurement data such as SAS score, SDS score, biochemical index level, antiemetic time, length of hospital stay and hospitalization cost were expressed as mean±standard deviation. Comparisons were made before

and after treatment in the same group using paired t test within the groups. The clinical efficacy was expressed by the total effective rate after 7 days and the chi-square test was has been performed for comparison between groups. When number of cases was < 5, the corrected chi-square was used; $P < 0.05$ was the statistically significance difference.

5. Results

5.1. Comparison of Clinical Efficacy Between the Experimental Group and the Control Group

After 7 days of the treatment, the total effective rate (91.67%) in the experimental group was significantly higher than the 72.92% in the control group.

Table 1. Comparison of clinical efficacy between the experimental group and the control group.

Name of groups	Most effective	Less Effective	No effect	Total effectiveness rate (%)
Experimental group (n=48)	29	15	4	44 (91.67)
Control group (n=48)	18	17	13	35 (72.92)
χ^2				4.575
P				0.032

5.2. Comparison of Nausea and Vomiting, Fatigue and Dizziness Symptom Scores Before and After Treatment in the Experimental Group and the Control Group

Before treatment, the scores of nausea and vomiting, fatigue and dizziness were not significantly different between the experimental group and the control group. After treatment, symptoms scores in the experimental group were significantly lower than those in the control group ($P < 0.001$), as shown in Table 2.

Table 2. Comparison of TCM symptom scores before and after treatment in the experimental group and the control group ($\bar{x} \pm s$).

Group	Feel sick and vomit		Exhausted		Dizzy	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Experimental group (n=48)	2.51±0.34	0.91±0.58 *	2.73±0.31	0.83±0.29 *	2.41±0.36	0.64±0.26 *
Control group (n=48)	2.46±0.29	1.42±0.63 *	2.64±0.26	1.42±0.38 *	2.36±0.33	1.34±0.41 *
t	0.775	-4.126	1.541	-8.551	0.825	-9.989
P	0.440	0.000	0.127	0.000	0.442	0.000

Note: Compared with the same group before treatment, * $P < 0.05$, the same below

5.3. Comparison of SAS and SDS Scores Before and After Treatment in the Experimental Group and the Control Group

There was no significant difference in SAS and SDS scores between the experimental group and the control group before treatment. After 7 days of treatment, the SAS and SDS scores of the experimental group were significantly lower than those of the control group ($P < 0.001$).

Table 3. Comparison of SAS and SDS scores before and after treatment in the experimental group and the control group ($\bar{x} \pm s$).

Group	SAS		SDS	
	Before treatment	After treatment	Before treatment	After treatment
Experimental group (n=48)	67.44±3.42	53.44±3.14 *	68.43±3.25	55.12±3.47 *
Control group (n=48)	66.87±3.68	62.52±5.61 *	68.04±2.97	61.92±3.89 *
t	-0.786	-9.785	0.614	-9.038
P	0.434	0.000	0.541	0.000

5.4. Comparison of Antiemetic Time, Hospitalization Time and Hospitalization Cost Between the Experimental Group and the Control Group

The experimental group had significantly shorter antiemetic time, hospitalization time and hospitalization cost than the

control group. The difference was statistically significant ($P < 0.05$). See Table 4.

Table 4. Comparison of antiemetic time, length of hospital stay and hospitalization costs between the experimental group and the control group ($\bar{x} \pm s$).

Group	Urine ketone body negative time	Antiemetic time	Length of stay
Experimental group (n=48)	3.64±1.79	4.62±1.76	6.24±1.35
Control group (n=48)	5.87±2.42	6.13±2.02	8.43±1.78
<i>t</i>	-5.133	-4.683	-6.792
<i>P</i>	0.000	0.000	0.000

5.5. Safety

During the treatment of the experimental group and the control group, there were no obvious adverse reactions.

6. Discussion

Early pregnancy reactions are more common in the early stages of pregnancy. Pregnant women may experience symptoms such as dizziness, burnout, loss of appetite, nausea and vomiting. Usually, the response is mild and does not have a significant impact on normal life. It can disappear without special treatment. However, there are a few pregnant women who can progress to HG, showing frequent nausea and vomiting, inability to eat and even cause electrolyte imbalance, which seriously threatens the life and health of pregnant women and is very harmful. Studies have shown that HG can reduce the weight of pregnant women, prolong the labor process, increase the rate of cesarean section and increase the risk of low birth weight infants [10]. With the change of modern lifestyle, the incidence of HG has gradually increased, so its treatment has also attracted widespread clinical attention. Although many scholars have devoted themselves to HG research, its etiology has not been fully clarified. At present, it is believed that its occurrence is related to factors such as hormone levels, nervous system disorders, malnutrition, *Helicobacter pylori* infection and psychological factors [11]. Due to the unknown pathogenesis, HG treatment has always lacked specific treatment methods. The treatment mainly consist of rehydration and antiemetic, while blindly long-term rehydration is not ideal and causes great pain to pregnant women and it is difficult to take oral medication. It is therefore, very important to find out a safe treatment for the HG patients.

Pregnant women have fast metabolism and large vitamin demand. The occurrence of HG prevents pregnant women from eating and the lack of long-term energy supply results in increased fat metabolism and increased ketone body production, which leads to ketosis. Vitamin B6 is a common enzyme composed of multiple components, which can be converted into coenzymes by absorption and plays an important role in protein and amino acid metabolism. It can promote the increase of γ -aminobutyric acid secretion in the brain, relax the cerebral blood vessels and increase the blood supply to the brain. Vitamin B6 down-regulate the activity of neurons and prevent the high fever of nerve cells; and it can enhance the activity of glucophosphatase and promote the synthesis of acetylcholine, thereby promoting brain

metabolism which improve cerebral blood supply, oxygen supply and down-regulate the sensitivity of nerve stimulation, thereby promoting vomiting relief [12]. Therefore, vitamin B6 supplementation has a positive effect on promoting the relief of HG symptoms during HG fluid replacement therapy.

In recent years, the advantages of ginger and vitamin B6 on HG have gradually become prominent. The physician believes that although the causes of HG are different, the pathogenesis is generally the same, that is, the main causes are upside down, stomach loss and fall, so the treatment should be based on the principle of "regulating the spleen and stomach, reducing down and stopping vomiting". HG syndrome differentiation can effectively alleviate HG symptoms of pregnant women and improve the quality of life of pregnant women. Acupressure application is the direct application of vitamin B6, which enters the blood circulation through osmosis, increases the effective blood concentration and reaches the diseased area directly. Studies have shown that drug application can play a dual role in drug effect and acupressure effect [13]. The efficacy of acupressure application is related to the choice of medicines and acupressure.

As the medical research on HG pregnant women moves forward the influence of psychological state on disease has caused great clinical attention. A healthy psychological state is of great significance for the maintenance of normal functions of the body [14]. Studies have found that pregnant women with severe stress, anxiety and poor living conditions have a higher incidence of HG, suggesting that the occurrence of HG may be related to psychological factors, economic factors and so on [15]. Related studies have shown that, anxiety and depression are the influencing factors that cause HG [16]. Due to lack of awareness of pregnancy and early pregnancy response and lack of correct coping styles, a few pregnant women have negative psychological states such as anxiety and depression and these adverse states can interact with pregnancy and vomiting, forming a vicious circle, causing the pregnant women's mental health level to continue to decline. The condition is difficult to control. Pregnancy is a normal physiological process, but it is still a difficult stress-adaptive process for some pregnant women, especially the first pregnant women. Pregnant women with different personalities have different emotional responses and their mental health levels are quite different. Numerous studies have shown that a healthy mental state can promote the relief of HG symptoms and a bad mental state can aggravate HG symptoms [17, 18]. Anxiety, depression and other negative emotions can stimulate the body to produce toxic substances, which can not only aggravate the

symptoms of nausea and vomiting, but also affect infants' neurodevelopment, resulting in cognitive and emotional impairment in the newborn. Therefore, in addition to physiological treatment such as fluid replacement, psychological treatment should not be ignored. This study uses a combination of individualization. With the participation of psychotherapists, specialists and specialist nurses, psychological treatment of pregnant women with HG is given and health education is given to improve pregnant women's awareness of HG and guide pregnant women to properly vent negative Emotional ways to give understanding, support and encouragement to promote disease recovery.

7. Conclusion

This study used vitamin B, acupressure application and psychological intervention for HG pregnant women. The results showed that after 7 days of treatment, the SAS and SDS scores of the experimental group were significantly lower than those of the control group. The levels of urinary ketones were significantly reduced and the levels of motilin were significantly increased. The total effective rate of treatment in the experimental group (91.67%) was significantly greater than that in the control group (72.92%). The antiemetic time and hospital stay in the experimental group were significantly reduced; indicating that vitamin B6 and acupressure application combined with psychological adjunctive treatment of HG had a significant effect and could significantly relieve pregnant women Anxiety, depression and promote the recovery of pregnant women. In addition, no significant adverse reactions were seen in the experimental group and the control group of treatments, indicating that vitamin B6, acupressure application and psychological assistance therapy are safe.

Limitation of the Study

This study has been carried on a limited number of patients due to limited sources. A comprehensive study on large number of patients in different age groups can recommend generalize treatment of HG pregnant women.

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