

Comparative Study of the Effectiveness of Ginger for the Treatment of Nausea and Vomiting in Induced Pregnancy

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Abstract Objective. The objective of our study was to examine the effectiveness of ginger for nausea and vomiting of induced pregnancy (NVIP). **Methods.** In a clinical trial in perinatal center of the Tashkent Institute for Post-Graduate Medical Education from 2009 to 2017 on pregnant women after ovulation induction, the effects of ginger (240 mg four times daily), vitamin B6 (40 mg twice daily) and metoclopramide were evaluated in treatment of NVIP. **Results.** In all groups, treatments led to reduction in PUQE-24 score. Scores of symptoms before treatment in ginger group were $10,8 \pm 2,03$, in vitamin B6 - $9,48 \pm 2,4$ and metoclopramide - $9,52 \pm 2,4$, and reduced to $4,23 \pm 1,1$, $8,23 \pm 1,1$ and $7,43 \pm 1,2$, respectively, in the sixth day of treatment; however, mean changes in the two groups were not significantly different. **Conclusion.** Vomiting was more reduced in ginger group and this reduction was statistically significant. There was significant difference between the groups in nausea occurrences and their duration. No side effect was observed in studied groups.

Keywords: induced pregnancy, first trimester, nausea and vomiting, ginger

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1. Introduction

According to the world literature, NVIP is the most common first trimester complication. So, according to statistics, 85% of pregnancies are complicated by nausea and vomiting in the early stages. The greatest frequency of this symptom observed on the 9th week and continues until around week 14 to 16 of gestation period [1].

The causes, pathogenetic mechanisms of the development of NVIP have not yet been clarified. Therefore, a wide range of drug groups is experimentally prescribed.

In turn, treatment with NVIP depends on the severity of the complication and is aimed at improving symptoms while minimizing the risk to the mother and fetus [2].

In the early stages of an induced pregnancy, specialists avoid using chemicals as much as possible due to their potential teratogenic effects. Thus, the trend towards alternative therapy is increasing [3,4].

Ginger has been used in traditional medicine in India, China and Iran for centuries. Today, the use of ginger in western countries is becoming increasingly common. One of the most common indications for its use being pregnancy-induced nausea and vomiting [5,6].

The results for the treatment of nausea and vomiting in pregnancy are encouraging; however, ginger should be

applied for the time being only in controlled clinical studies [7,8].

The aim of this study is to compare the effectiveness of ginger in treatment of NVIP.

2. Methods and Materials

Entry criteria:

- 4-12 weeks duration of gestation,
- pregnant, suffering NVIP,
- the presence of the informed, written consent of the patient to participate in the study and in compliance with the instructions of the doctor regarding the prescribed therapy,

The following exclusion criteria were established:

- presence of concomitant diseases (urinary tract infection, gastrointestinal, hepatic, hematological, endocrine pathologies, diabetes, arterial hypertension),
- taking any other drugs,
- the presence of hyperemesis gravidarum, which requires hospitalization,
- food intolerance and allergy to ginger,
- history of recent hospitalization related to NVIP.

The basis of our comparative study of was 160 patients in whom their first trimester was complicated by the development of nausea and vomiting of varying severity.

Patients were included in the study on the basis of informational consent and were warned about possible side effects, such as heartburn and drowsiness, to report in case of occurrence.

As the analysis of the literature devoted to NVIP therapy shows, during remedial measures it is extremely important to adhere to a certain rating scale in order to track the dynamics of changes, determine the appropriate treatment and its correction.

In this regard, we used an updated version of the Pregnancy-Unique Quantification of Emesis scoring system - PUQE-24, where the gravity of the NVIP is estimated based on three clinical symptoms of complications: nausea, vomiting and retching in the previous 24 hours (Ebrahimi et al., 2009).

For the purpose of comparative evaluation of the effectiveness of various methods for treating NVIP in the first trimester of induced pregnancy, the patients were divided into three groups:

- group I (n = 52) - NVIP therapy was based on the use of ginger (250 mg 4 times daily),
- group II (n = 54) - treatment tactics based on the use of vitamin B6 (40 mg twice daily),

- group III (n = 54) - antiemetics (metoclopramide) were used as the main therapy.

All three groups also followed an appropriate diet, which included eating small portions of food several times a day, a soft diet low in fat, carbohydrates and high protein, and small amounts of fluid between meals, including mineral drinks.

The overall clinical characteristics of pregnant women are presented in Table 1. As can be seen, three groups were matched in all variables ($P > 0,05$).

The symptoms of patients were scored by PUQE-24 scoring system.

In PUQE-24 scoring system, times of feeling of nausea during a day, number of occurrences of vomiting during a day, and number of retches during a day were scored on a 1-5 scale, and, accordingly, the score 6 or lower was considered as mild, 7 to 12 as moderate, and 13 or higher as severe symptoms.

The distribution of patients within groups according to PUQE-24 is shown in Figure 1, where it can be seen that the groups were also comparable in this indicator with the prevalence of patients with moderate NVIP, a total of 106 (66.25%) pregnant women.

Table 1. Evaluation of characteristic variables between the three groups

	Ginger (n=52)	Vitamin B6 (n=54)	Metoclopramide (n=54)
Age (year)	26,5±3,7	27,3±5,2	26,8±3,2
Weight (kg)	62,3±7,1	60,4±6,7	61,4±6,7
Height (m)	1,65±0,06	1,60±0,05	1,62±0,05
BMI (kg/m ²)	26,0±2,4	24,8±3,0	25,3±3,0
Gestational age (week)	8,2±3,4	8,8±2,8	7,9±3,8
Gravidity, (%)			
1	63,2%	60,5%	62,5%
2	31,6%	31,6%	32,5%
3	5,2%	7,9%	5%
Parity, %			
0	92,3%	94,4%	94,4%
1	7,7%	5,6%	5,6%
Abortion, %			
0	80,4%	80,4%	79,5%
1	15,7%	17,6%	17,6%
2	3,9%	0%	0%
History of nausea and vomiting in previous pregnancy, %			
+	36,84%	34,2%	39,5%
-	63,16%	65,8%	60,5%

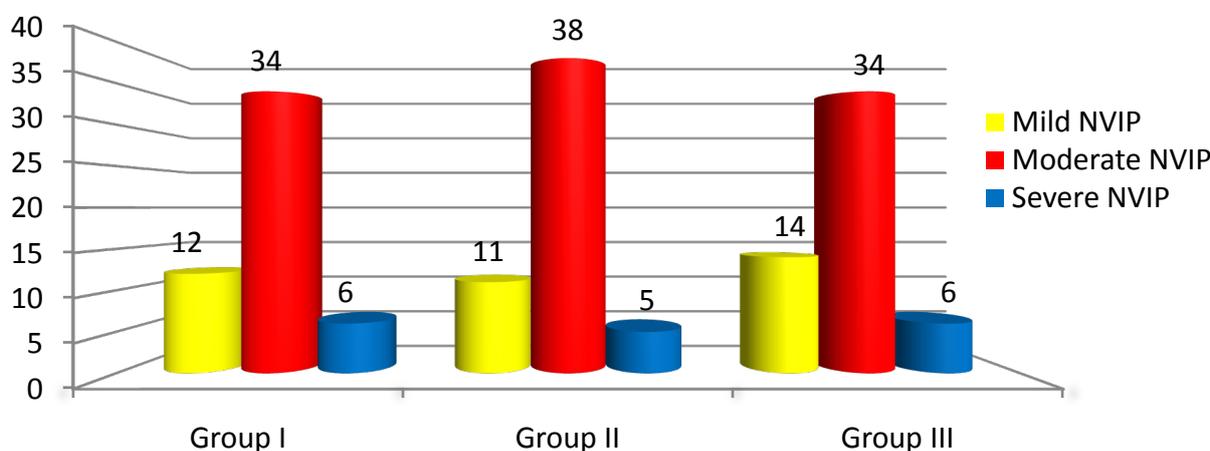


Figure 1. Распределение беременных в группах по тяжести NVIP

Table 2. Comparative dynamics of changes in the rate of PUQE-24 at the stages of therapy

Group	Before	2 days late	4 days late	6 days late	P (within groups)
Ginger	10,8±2,03	8,2±2,2	6,1±2.1	4,23±1.1	0.002
Vitamin B6	9,48±2,4	9,2±1,8	8,9±2.1	8,23±1.1	>0.05
Metoclopramide	9,52±2,4	9,3±1,2	9,0±2.2	7,43±1.2	>0.05
P (between groups)	0.08	0.08	0.05	0.03	-

Analysis of the results of treatment was carried out on the second, fourth and sixth days. The main criterion for the effectiveness of therapy was the dynamics of the change in the PUQE-24 index, i.e. frequency and severity of clinical manifestations of NVIP.

In the process of studying the dynamics of manifestations of NVIP at the stages of the three compared treatment approaches, it could be noted that each of them to some

extent led to a decrease in the PUQE-24 index (Table 2).

However, in the main group of patients who received ginger, significantly lower PUQE-24 indices were found compared to patients in the comparison groups.

Thus, according to our data, ginger was more effective than pyridoxine and metoclopramide, and the dynamics of PUQE-24 clearly show the positive effect of ginger treatment (Figure 2).

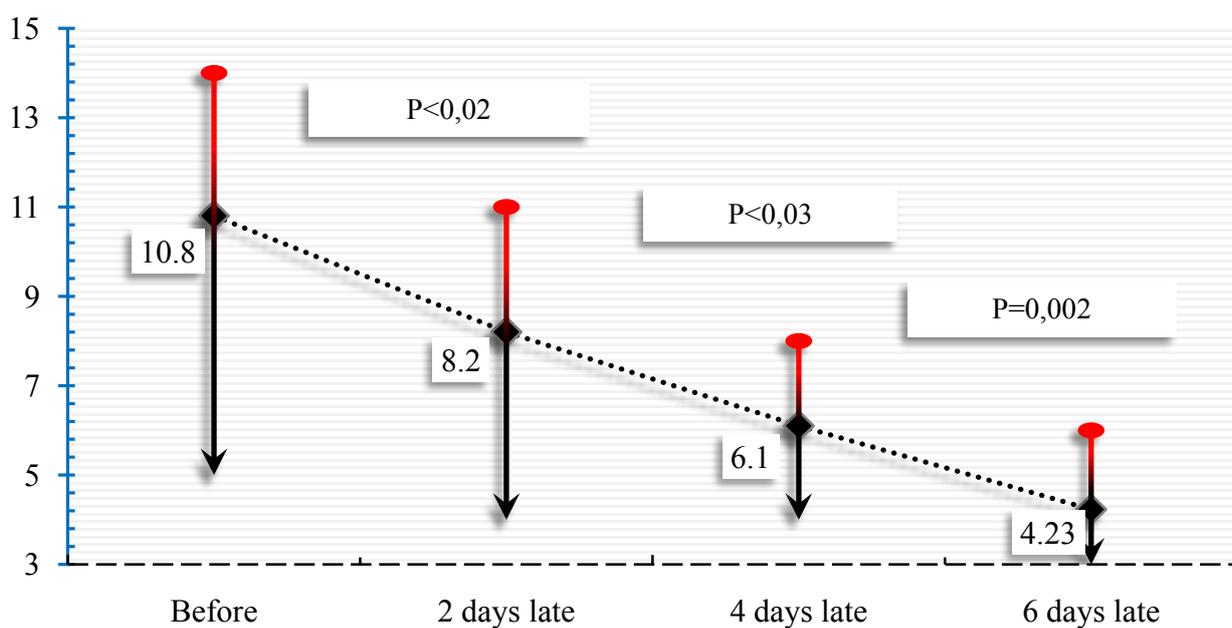


Figure 2. Dynamics of PUQE-24 score at the stages of NVIP treatment in the ginger group

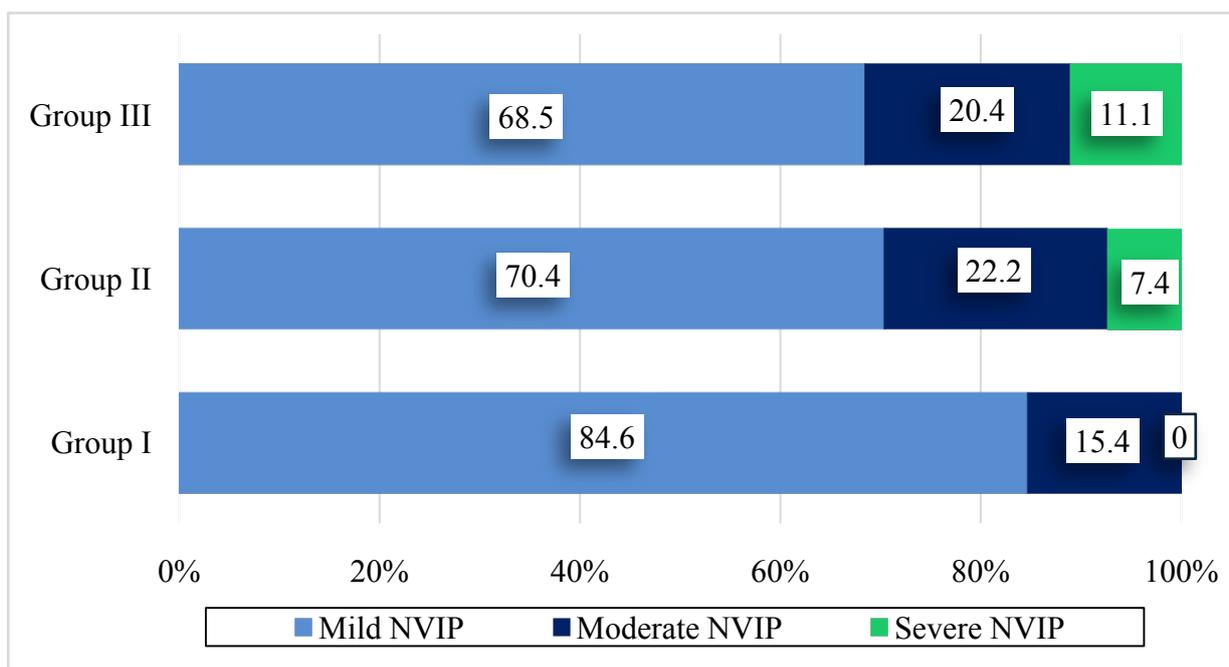


Figure 3. The distribution of patients according to PUQE-24 after treatment on day 6

The distribution of patients within the groups according to the PUQE-24 classification after treatment on day 6 is shown in Figure 3. As can be seen from the figure, in the main group, 44 (84.6%) women were attributed to the mild severity of NVIP, 8 (15.4%) to moderate NVIP, patients with severe NVIP were not observed in this group.

In the comparative group on day 6 after pyridoxine therapy in 70.4% (n = 38) cases, mild NVIP was observed, 22.2% were attributed to mild NVIP (n = 12) and 7.4% (n = 4) to severe NVIP. In the group of pregnant women who received metoclopramide, by the end of the study, 37 (68.5%) patients had a mild degree of NVIP, 11 (20.4%) had moderate severity, and 6 (11.1%) had a severe degree.

3. Discussion and Conclusion

Nausea in early pregnancy is still considered as a physical, emotional, social, and economic problem, for which many therapeutic methods have been proposed and applied. Administration of vitamin B6 is the first-line treatment of nausea and vomiting. In the conducted studies, ginger has proven to be more effective than placebo in reducing pregnancy nausea; in some studies, its effect has been reported to be equal to or even more than that of vitamin B6.

In this study, we intended to evaluate and compare the effects of vitamin B6 and ginger in treatment and control of the symptoms of illness in Iranian patients; so that, in case of sufficient effectiveness at least equal as an alternative cure in treatment of our patients.

The use of ginger in early pregnancy will reduce their symptoms to an equivalent extent as vitamin B6 [9].

Results of a study by Portnoi et al. suggest that ginger does not appear to increase the rates of major malformations above the baseline rate of 1% to 3% and that it has a mild effect in the treatment of NVP [10].

In this study, the two study groups of vitamin B6 and ginger were identical in terms of the basic variables and also admission of people.

Compared to the last day of therapy, the pretreatment score of symptoms in both groups had a significant reduction; however, the changes of the symptoms in the two groups were similar. Mean change was 8.32 ± 2.19 in the ginger group and 7.77 ± 1.80 in vitamin B6 group ($P=0.172$).

Chittumma et al. treated 126 pregnant women with 650 mg ginger or 25 mg vitamin B6 three times a day for 4 days, where both methods were significantly effective in reducing nausea, retch and vomiting; however, efficiency of ginger was significantly higher than that of vitamin B6. The complications in both groups were reported to be slight and identical [11].

Ensiyeh and Sakineh treated 70 pregnant women in two equal groups with 1 g ginger or 40 mg vitamin B6 daily for 4 days. In this study, ginger was more effective than vitamin B6 in reducing nausea and vomiting, but both had similarly led to a significant reduction in nausea occurrences [12].

In these two studies where the effect of ginger has been reported to be higher than that of vitamin B6, where

the dosages of vitamin B6 were 75 mg and 40 mg, respectively, which are lower than the dosage applied in our study (80 mg) [12,13].

Sripamote and Lekhyananda in a clinical trial treated 138 pregnant women with 500 mg ginger or 10 mg vitamin B6 three times a day. They compared the symptoms at the day before treatment with those of the third day of treatment and found that nausea and vomiting occurrences in both groups were significantly reduced; however, there was no significant difference [8].

Smith et al. in a randomized clinical trial compared the effect of ginger and vitamin B6 in relieving pregnancy-induced nausea and vomiting in 291 pregnant Australian women. These cases were treated with 1 g ginger or 75 mg vitamin B6 for 3 weeks, where ginger has been as effective as vitamin B6 in reducing nausea, retch, and vomiting [9].

While data are insufficient to recommend ginger universally and there are concerns about product quality due to limited regulation of dietary supplements, ginger appears to be a fairly low-risk and effective treatment for nausea and vomiting associated with pregnancy [13].

In our study, the use of ginger in women with NVIP led to significant decrease in PUQE-24 scores. There was significant difference between effectiveness of ginger and vitamin B6, and metoclopramide in reducing the symptoms of NVIP. No side effects were observed in three groups.

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