

Implementing Standardised Rhodes Index to measure the Efficacy of ginger extract (*Zingiber officinale*) in pregnancy induced nausea and vomiting

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Abstract

Background: To estimate the efficacy of ginger extract (*Zingiber officinale*) in pregnancy induced nausea and vomiting.

Methods: A total of 30 women with pregnancy of 4-16 weeks, suffering from nausea and vomiting were included in this study (n=30). Subjects were given ginger extract 250 mg, 3 times a day half an hour before food for 1 week. Severity of vomiting was assessed by Rhodes Index of Nausea and Vomiting.

Results: Effect with the ginger extract in pregnancy induced nausea and vomiting was assessed at the end of treatment (day 7) and compared with the baseline values. (p<0.005).

Conclusions: Ginger extract (*Zingiber officinale*) helps in reducing severity, frequency of pregnancy induced nausea and vomiting.

Keywords: Rhodes Index, ginger extract, *Zingiber officinale*, pregnancy induced nausea and vomiting.

1. Introduction

Nausea and vomiting is a commonly encountered problem by women in early pregnancy. Nausea is prevalent in about 50 to 80% of pregnant women, and vomiting and retching in about 50%.¹ Retching or dry heaving, without expulsion of the stomach's contents is a distinct symptom that is increasingly measured separately to vomiting and nausea[3-5].

The misnomer 'morning sickness', which is colloquially used to describe nausea, vomiting and retching of pregnancy, contradicts the fact that symptoms can occur at any part of the day. Nausea, vomiting and retching are experienced most often in the first trimester, between six and 12 weeks, but this can continue to 20 weeks and persists after this time in up to 20% of women. [1-6]

Hyperemesis gravidarum, which is characterized by severe and persistent vomiting, is less common, affecting between 0.30% and 3% of pregnant women [1,6,7]. Ketosis is also commonly included as a consequence of hyperemesis gravidarum[8, 9] However, inpatient hospitalisation is not included in the definition of hyperemesis gravidarum because occasionally, it may be alleviated or controlled by outpatient interventions [10].

Within the operational definitions of hyperemesis gravidarum, there is generally a focus on the effects of the vomiting like dehydration, ketosis and weight loss. It is important to exclude pathological causes of nausea and vomiting before concluding that it is specific to pregnancy. Conditions such as peptic ulcers, cholecystitis, gastroenteritis, appendicitis, hepatitis, genito-urinary (e.g. pyelonephritis), metabolic and neurological disorders should be ruled out [9,12,13].

The main objective of the study was to estimate the efficacy of ginger extract (*Zingiber officinale*) in pregnancy induced nausea and vomiting.

2. Methods

2.1 Study Population: Women attending the antenatal clinic

2.2 Inclusion criteria

Women between 4 and 16 weeks of gestation, with pregnancy confirmed by urine pregnancy test and with nausea or vomiting.

2.3 Exclusion criteria

Signs of clinical dehydration, Known allergy to ginger, Gallstones or any other disease of the gallbladder, Diabetes or on any drugs to control blood sugar levels, cardiovascular disorders and any factor affecting clotting time

2.4 Ethical clearance

Institutional ethical committee clearance was obtained before the beginning of the study and informed consent was taken from subjects prior to enrolling them in the study.

2.5 Methodology

Women who meet the eligibility criteria were enrolled into the study. Demographic information, general history and history of nausea and vomiting were taken. Health status assessment was conducted for each woman before initiation of the study. They were then requested to fill the Rhodes Index of Nausea and Vomiting Form 2. The frequency, severity of vomiting and the approximate volume of the vomitus was recorded. They were then asked to complete the Rhodes Index of Nausea and Vomiting Form 2 for 3 days as a baseline before administering the extract. The Rhodes scale is a 5-point Likert scale ranging from 0 to 12, with larger scores indicating more symptoms. A major issue in interpreting and comparing studies on the management of NVP has been the use of numerous different methods to qualify and quantify nausea, vomiting and related symptoms. Different researchers have arbitrarily defined NVP as "mild", "moderate" or "severe" without clear quantitative definitions or biological logic. Often the assessments have been retrospective. In some cases end points were measured dichotomously as success/failure or as percentage preferring one drug over the other (in crossover studies). While these approaches may be reasonable in randomised control trials (RCTs), assuming that all arms of the studies are evaluated similarly, the clinical interpretation of arbitrary endpoints and comparison between studies becomes difficult, if not impossible. Rhodes Index is a standard, validated tool that will allow comparison among studies to assess nausea and vomiting in pregnancy. It separately scores, as categorical variables, the number of vomiting episodes per day, the size of the vomiting, the degree and length of nausea and retching, as well as the distress associated with the condition (Table 1).

Table 1: Rhodes Index of Nausea, Vomiting and Retching

Patient Initial: _____
 Date: _____
 Day of week: _____
 Time of day: _____

Direction: Please mark the box in each row that most clearly corresponds to your experience. Please make **one** mark on each line.

1.	In the last 12 hours, I threw up ____ times.	7 or More	5-6	3-4	1-2	I did not throw up
2.	In the last 12 hours, From retching and dry heaves, I have felt ____ distress.	No	Mild	Moderate	Great	Severe
3.	In the last 12 hours, from vomiting or throwing up, I have felt ____ distress.	Severe	Great	Moderate	Mild	No
4.	In the last 12 hours, I have felt nauseated or sick to my stomach.	Not at all	1 hour or less	2-3 hours	4-6 hours	More than 6 hours
5.	In the last 12 hours, from nausea/sickness to my stomach, I have felt ____ distress.	No	Mild	Moderate	Great	Severe
6.	In the last 12 hours, each time I threw up, I produced a ____ amount.	Very large (3 cups or more)	Large (2-3 cups)	Moderate (1/2-2 cups)	Small (up to 1/2 cup)	I did not throw up
7.	In the last 12 hours, I have felt nauseated or sick to my stomach ____ times.	7 or more	5-6	3-4	1-2	No
8.	In the last 12 hours, I have had periods of retching or dry heaves without bringing anything up ____ times.	No	1-2	3-4	5-6	7 or more

The questionnaire can be administered once or twice a day and, in addition to an overall score, one can report separately on the frequency and changes in nausea, vomiting, retching and stress⁷: Ginger extract was prepared by Sami Labs (Bangalore) with a certificate of analysis issued that ensures the products were standardized and quality controlled.

The study subjects were given the required quantity of ginger extract and instructed to take 250 mg, 3 times a day half an hour before food for 1 week.

At the end of 1 week the Rhodes Index of Nausea and Vomiting Form 2 was reassessed, and any change in the frequency of nausea and vomiting was recorded at the end of 1 week. Secondary outcomes included the occurrence of any side effects.

2.6 Statistical analysis

Statistical data was analysed using SPSS Software Version 18. The hypothesis was tested using paired 't' test to assess the change from baseline. Demographic data are described using Mean and Standard Deviation.

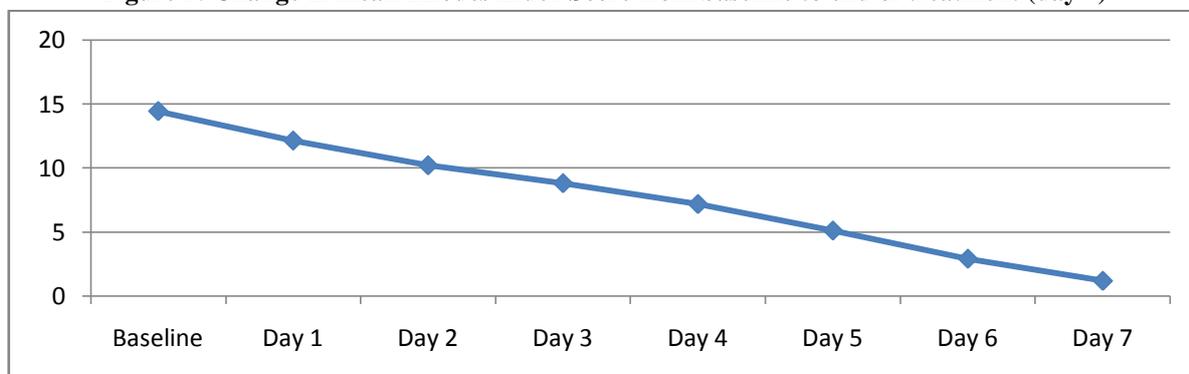
3. Results

A total of 30 women with pregnancy of 4-16 weeks, suffering from nausea and vomiting were included in this study. The mean age was 22.17 years (SD 2.230) and mean duration of pregnancy was 11.43 weeks (SD 1.716). The Rhodes Index scores at baseline and from days 1 to 7 are shown in table 2. The change in the scores from baseline to the end of treatment (day 7) is shown in fig. 1. There was a statistically significant effect with the ginger extract in pregnancy induced nausea and vomiting when patients were assessed at the end of treatment (day 7; $p < 0.005$). Four patients reported symptoms of heartburn. Otherwise, there were no other reports of any adverse effects.

Table 2: Rhodes Index Score at baseline and during treatment with ginger extract

Day of assessment	Minimum Score	Maximum Score	Mean Score	Standard Deviation
Baseline	9	22	14.43	3.520
Day 1	6	20	12.13	3.785
Day 2	4	19	10.20	3.537
Day 3	3	15	8.80	3.408
Day 4	2	12	7.17	3.018
Day 5	2	10	5.10	2.796
Day 6	0	7	2.90	1.900
Day 7	0	6	1.17	1.341

Figure 1: Change in mean Rhodes Index Score from baseline to end of treatment (day 7)



4. Discussion

In our study, 30 pregnant women with nausea and vomiting were treated with ginger extract for a period of one week. They were assessed using the Rhodes Index at baseline as well as on all the days during the treatment period. There was a significant decrease in the mean Rhodes Index score from baseline (14.43) to end of treatment (1.17; $p < 0.05$). There have been several studies as discussed in the section on 'Review of Literature', comparing the effects of ginger vs. placebo [14-18], vitamin B6 [19] and other antiemetics in the management of nausea and vomiting of pregnancy. Ginger has been shown to be better than placebo in all these studies, and at least as good as vitamin B6 and other antiemetics like diphenhydramine and metoclopramide. Of the various published studies, three of them used the Rhodes Index to evaluate the efficacy of ginger [17]. In our study also, we used this Index, since it is a self-administered questionnaire, which can be easily filled out by the patient, and also helps in effectively assessing the degree of nausea, vomiting and retching. Ginger seems to be well-tolerated by the woman, as well as no reports of any fetal anomalies. Four patients reported side-effects, which was heartburn in our study. There were no other adverse effects reported. Two studies comparing ginger with vitamin B6 report sedation and heartburn as the most frequent adverse effects. However, there was significant difference between the two treatment groups in their incidence [18,19]. It is important to note that pregnant women as such tend to suffer from heartburn because of laxity of the gastroesophageal sphincter, and somnolence because of tiredness. Therefore, these adverse effects with ginger may not be significant. The main limitations of our study are that the sample size is small, and that it is a single-arm study, with no comparator. Currently, we are recruiting patients for the placebo arm, and will be comparing the findings with that of the current study.

5. Conclusion

Ginger (*Zingiber officinale*) is one of the more commonly used herbal supplements for various indications. The current study showed that ginger extract is efficacious in the management of nausea and vomiting in pregnancy, similar to findings from previous literature.

Declarations

Funding: Indian Council of Medical Research-Short Term Studentship Program.

Conflict of interest: NIL

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