POTENTIAL THERAPEUTIC IMPLICATIONS OF ACUTAPING ON NAUSEA AND VOMITING DURING PREGNANCY

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Resumo

Objective: The study aims to determine the potential therapeutic implications of acutaping on frequency of nausea and vomiting in pregnant women and its impact on quality of life.

Materials & Methods: A single randomized prospective clinical control trial. It involved twenty-seven prim gravida pregnant women aged between (20-35) years, 7-16 weeks of pregnancy and a body mass index less than 30 kg/m². They have been divided into two groups (A and B) randomly. Group A included fourteen pregnant women received acutaping plus traditional medical treatment. Group B included thirteen pregnant women received traditional medical treatment only. The two groups were assessed by pregnancy unique quantification of emesis and nausea questionnaire when the study got started, post the first treatment (in 4th day) and after the second treatment (in 8th day).

Results: The frequency of vomiting and nausea between both groups significantly decreased post the second treatment ($p<0.05$) and this significant decrease in favour of group A. Also, there was an improvement in the quality of life between the two groups after the second treatment ($p<0.05$) and this significant improvement in favour of group A.

Conclusion: We can come to a conclusion that Acutaping is effective in decreasing frequency of nausea and vomiting symptoms during pregnancy and improving pregnant quality of life.

Keywords: Acutaping, Nausea, vomiting, pregnancy unique qualification of emesis and nausea questionnaire

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Introduction

Pregnant women experience physiological and anatomical changes for dealing with the amplified metabolic needs of the pregnancy, meeting the growing demands of the fetus and to let mother and fetus to tolerate the stresses of childbirth. Considerate these changes is important for all physicians care pregnant females as clinical evaluation of a pregnant female can be mystifying and difficult [1].

Up to 70% of pregnant women experience nausea and vomiting, making it the most prevalent pregnancy-related ailment [2]. During pregnancy, nausea and vomiting often start in weeks five and six, peak in weeks eight and nine, and then go away in weeks sixteen and twenty [3]. Although the majority of NVP sufferers only have symptoms during the first trimester, 15% to 20% of women experience symptoms that last into late pregnancy, and in 5% of cases, the symptoms last the entire duration of the pregnancy [4].

The most frequent reasons of nausea and vomiting during pregnancy (NVP) are complex and may include genetic factors, placental abnormalities, and hormone imbalances [5]. Genetic factors: The following are examples of evidence supporting a genetic predisposition: The prevalence of pregnancy-related nausea and vomiting in monozygotic twins [6] ; the finding that mothers and siblings of patients with NVP are more probable to be affected more than family members of those that are not [7-9]; the difference in prevalence among ethnic groups; the increased incidence of NVP in people who are more likely to get it because of genetic factors like taste perception [10]; and the incidence of NVP in females with hereditary glycoprotein hormone receptor anomalies [11, 12]. The emetic response is essentially the same regardless of the exact trigger: a retrograde large contraction that moves tiny intestinal contents into the stomach is followed by a substantial decrease in gastric tone and motility. The transit of gastrointestinal contents is then made easier by the combination of the diaphragm and abdominal muscles contracting and the gastro-oesophageal sphincter relaxing [13].

The degree of vomiting may be so severe that hospitalisation is necessary due to weight loss, electrolyte imbalance, and dehydration [14]. Proteinuria and preeclampsia were more common in pregnant women with NVP and nausea only than in those without symptoms [15]. NVP also significantly impairs quality of life (QoL), particularly with regard to work function and physical QoL. This effect is noticeable throughout the NVP spectrum, but it is noticeably worse with more severe symptoms [16]. Pregnant women who experience persistent morning sickness are more likely to experience signs of postpartum depression [17] and a high risk of low birth weight is associated with severe NVP [18].

Research has consistently demonstrated that pregnant and planning women have a high impression of teratogenic risk when it comes to using medications during pregnancy [19, 20], and that this is also true for NVP [21], which is something that most pregnant women go through. Over the past few decades, the available treatments have essentially stayed the same, and the antiemetics currently advised for the treatment of hyperemesis gravid arum partially help affected people. [5]. Despite the fact that there are a number of pharmaceutical treatments for NVP, many doctors and expecting women prefer non-pharmacological therapy over pharmaceutical ones due to concerns about how it may affect the foetus [22, 23]. Acupuncture, acupressure, and stimulation bands are examples of non-pharmaceutical treatments by the continuous exertion of pressure on certain Points [24]. Additional methods of treating morning sickness included hypnosis, relaxation techniques, herbal medicines like ginger, chamomile, and peppermint, dietary changes, activities, psychiatric treatments, behavioural treatments, and emotional support [25, 26].

Traditional Chinese acupuncture has long been promoted as a beneficial antiemetic [27]. Acupressure is an alternate method of treating nausea and vomiting [28]. Neiguan point P6 has been stimulated been demonstrated to greatly reduce nausea and vomiting in a World Health Organization, (WHO) study [29]. In addition, P6 stimulation also has a consequences of sedation [30, 31]. Also NVP can be treated with cupping therapy, which stimulates the acupuncture point (p6) without producing electrical feeling or pain [32].

Kinesio tape is a drug-free, elastic therapeutic tape used to treat a number of musculoskeletal conditions, such as pain, injury, dysfunction and other conditions [33]. Acutaping is a gentle form of treatment that relieves both acute and chronic pain. The sore area is wrapped in the extensible tape bandage (Kinesiotape). The broad manual medical sciences and Chinese acupuncture guidelines are where the concept for this method first emerged [34, 35]. Acutaping may be the taping technique that is employed and most widely recognised internationally, second only to kinesiological taping after Kenzo-Kase. Acutaping exhibits a range of indications that are comparable to those seen with acupuncture when the diagnostic and therapeutic principles of Chinese medicine are used [36].

Numerous research has examined the effects of acustimulation, such as electrical stimulation, acupuncture, and acupressure, on nausea and vomiting

in pregnant women [37-40]. Dry cupping can also be used to stimulate this point [32]and auriculotherapy is also utilised for NVP [41]. Since no research has been done to date on the possible therapeutic implications of acutaping on pregnancy-related nausea and vomiting, the primary goal of our study was to identify these effects using a non-invasive, painless, and inexpensive technique.

Materials & Methods

Study design

A single randomized prospective clinical control trial was conducted on twenty-seven pregnant women with nausea and vomiting during pregnancy were selected from Damanhur Teaching Hospital from February 2023 to March 2024. Prior to starting the study, a consent form was signed by each woman before to their involvement in the research. The research took place in compliance with the Helsinki Declaration ethical guidelines of 1964's and received approval from Kafrelsheikh University's Faculty of Physical Therapy's Research Ethical Committee, Egypt (No. P.T.REC / WH /1/2023/26) and authorised by Kafrelsheikh University's Faculty of Physical Therapy Institutional Review Board. This study had a Pan African Clinical Trials Registry registration (No. NCT06259747).

Participants

To prevent selection bias, two wrapped cards that represented the two-therapy group were chosen at random by the patients using a single random method. These cards are the follows:

Group A was given acutaping plus traditional medical treatment (Doxylamine and Pyridoxine)

Group B was given traditional medical treatment (Doxylamine and Pyridoxine) only.

The entire sample size that was analysed was 27 subjects with group A consisted of 14 subjects, while group B had 13 subjects allocated randomly. The eligible participants met the following criteria for inclusion: A pregnant woman who experiences nausea and vomiting referred from physician and had a score on pregnancy unique quantification of emesis and nausea questionnaire (PUQE) 6-13 for frequency and 3-7 for QoL, prim gravida, aged between of 20 and 35, a body mass index (BMI) lesser than 30 kg/m2, and a gestational age of 7 to 16 weeks. Patients who met any of the following requirements were not accepted: Diabetes, dehydration, gastrointestinal disorders, and/or hospitalisation. (Figure 1)

Initially, Age, weight, height, BMI, and gestational age were recorded, and the Pregnancy Unique Quantification of Ememesis and Nausea Questionnaire (PUQE) was used for evaluation [42]. There are two sections to this PUQE questionnaire. The first one is for determination of the frequency of dry heaviness without vomiting and nausea and vomiting, as well as the overall score of these symptoms (sum of replies to 1, 2, 3 questions): to classify the severity of NVP. Every query is graded on a scale of 1 to5. A total score of 3 to 15 points is possible; score≤ 6 points denote a weak NVP, moderate NVP is indicated by score from7 to 12 points, while severe NVP is indicated by score 13 or more points, and the second section to determine how the first section affected the pregnant women's quality of life, a scale of 0 to 10 is used for the quality of life question, where 0 represents the worst conceivable outcome and 10 represents how good she felt before to becoming pregnant. Its validation was confirmed [43].The PUQE is widely used as a scoring system to assess NVP severity in many countries [44-47]. Both groups were assessed by PUQE at the start of the study post the first treatment (in 4th day) and after the second treatment (in 8th day).

Procedure

Each woman in group (A), has received acutaping and traditional medical treatment (Doxylamine and Pyridoxine [48, 49]: 2 tablets taken at bedtime). Everyone in group (A) sit in sitting position comfortably in chair or long sitting with free left upper limb to apply the acutaping unilaterally on left side upper limb in right handed women.

Acutaping which is applying of the kinesio tape on finger and forearm flexor tape [35] (figure 2) after localization of the acupoints of application [50]: P.3 (at the ulnar side of the tendon of M. biceps brachii, on the transverse cubital crease), P.4 (on the line connecting P.3 and P.7, 5 cun above the wrist's transverse crease, between the palmaris longus and flexor carpiradialis muscles), P.5 (3 cun above the wrist's transverse crease, between the palmaris longus and flexor carpiradialis muscles), P.6 (2 cun above the wrist's transverse crease, between the tendons of palmaris longus and flexor carpiradialis muscles), and P.7 (Between the tendons of palmaris longus and flexor carpiradialis muscles, in the depression in the middle of the transverse crease of the wrist, between the tendons of palmaris longus and flexor carpiradialis muscles), for 2 treatments every treatment for 3 consecutive days and 1 day interval before

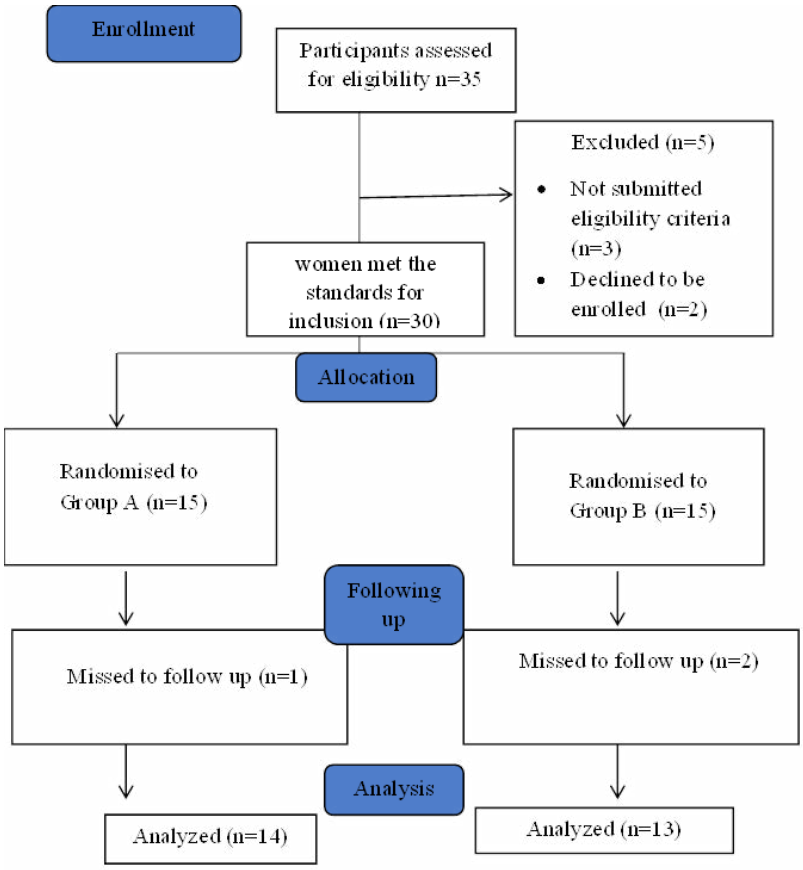

Figure 1. Flow chart for the ongoing study.

assessment and second treatment for this group . The therapist applied the tape on forearm with preliminary stretch of the muscles and joints through extend arm straight from the elbow, did wrist extension as much as patient can and turn forearm to the outside in the direction of the little finger. By using 3 tapes: First strip of tape – from middle of palm of hand over the inner side of the forearm to the part of the elbow that faces the body Second strip of tape – start it a little below the elbow at the outer side of the forearm and angle it up over the inner side of the elbow end at the part of the elbow facing the body Third strip of tape – place it across the inner side of the wrist (Figure 2).

All of the women in group (B) have only received traditional medical treatment (Doxylamine and Pyridoxine [48, 49]: 2 tablets taken at bedtime).

Statistical analysis

Statistical analysis carried out using the statistical package for social studies (SPSS) version 27 for windows. Normality test of data using Shapiro-Wilk test was used, reflecting the data was normally distributed for nausea, vomiting, dry heaviness, total scoring of frequency, and quality of life, so the "pre," "post 1st," and "post 2nd" treatments for each group were compared using parametric statistical testing in the form of the paired t test and in order to compare the two groups in the "pre", "post 1st", and "post 2nd" treatments, the "unpaired t test" was used. The alpha level was set at 0.05.

Results

Age, BMI, and gestational age differences were determined to be statistically non-significant (P < 0.66, 0.06 and 0.34) respectively, which indicates homogeneity between two groups (A & B) at the beginning of the study as represented in Table 1.

Regarding within group's comparison, statistical analysis utilising "Paired t test" showed that there was a significant decline in nausea, vomiting, dry heaviness and total scoring of frequency at post second treatment in compare to pre-treatment and post first treatment at the two groups with ($p < 0.05$), as present in Table 2. Taking into account the effect of the tested group (first independent variable) on nausea, vomiting, dry heaviness and total scoring of frequency "unpaired t test" showed that there was significant distinction between both groups at post second treatment ($p < 0.05$) and this significant decrease in favour to group A.

Regarding quality of life within group's comparison, statistical analysis utilising "Paired t test" revealed that there was a significant increase at post second treatment in compare to pre-treatment and post first treatment at the two groups with ($p < 0.05$), as present in Table 3. Taking into account the effect of the tested group (first independent variable) on quality of life, "unpaired t test" showed that there was significant distinction between both groups after second treatment ($p < 0.05$) and this significant increase in favour to group A (Table 2, Table 3).

Discussion

The current study's findings revealed that study group A significantly improved on all assessed variables when compared to the baseline evaluation. The notable decline in the overall rate of vomiting, nausea, and dry heaviness scores is in line with several studies. A review of 7 trials showed that the neigong point acupressure could aid symptoms of nausea [51]. Acupressure of the Chinese acupuncture P6 point has been proved to lessen the feeling of nausea in patients with postoperative nausea and vomiting and chemotherapy-induced nausea, and may be beneficial for treating hyperemesis gravid arum. In comparison to controls, women who received weekly acupuncture treatments for four weeks experienced reduced nausea and dry retching, according to a single-blind randomised, controlled study including 593 women under 14 weeks of gestation [52]. A wristband with a button above the P6 point was used to apply acupressure for two weeks to 60 women with NVP in a recent study. The button on placebo wristbands provided pressure to a point on the wrist that was not very important. Acupressure was not administered to a no treatment group. Prior to treatment and on days 1, 3, 6, and 14 of treatment, a questionnaire was completed. Nausea was measured using visual analogue scales, in which 0 denoted no nausea and 100 denoted severe nauseas. A day after the acupressure at P6 began, there was a noticeable reduction in nausea, which persisted for the duration of the 14-day treatment. On the other hand, the degree of nausea did not change in patients who were not receiving treatment. Patients who received a placebo initially recovered, but by day six, their nausea symptoms were identical to those of the group that received no treatment [53]. Proof from studies using no pharmacological and pharmacological methods to treat vomiting and nausea in early pregnancy recommend that many effective treatments diminish the severity of symptoms rather than alleviate symptoms completely [54]. Using P6 point acupressure using a wristband for at least 3 days appears to effectively ease pregnancy-related nausea and vomiting [55]. This impact of acutaping can be explained by the knowledge and experiences of PR actioners of Chinese medicine, manual healing and osteopathy which are brought together in the therapeutic methods of taping. The acutaping is applied to the muscle groups and acupuncture meridians that are associated with nausea and vomiting. Their presence causes an irritation of the physical structures that lie beneath the tape -the skin, the loose connective tissue,

Figure 2. Application of acutaping for pregnant woman.

Table 1. General characteristics of subjects of group A and B.

Items	Group A	Group B	t-value	p-value	Significance
	mean ± SD	mean ± SD			
Age (years)	26.79 ± 2.91	27.31 ± 3.22	0.442	0.662	NS
BMI (kg/ m^2)	25.34 ± 1.56	24 ± 1.89	2.004	0.056	NS
Gestational age (weeks)	11.14 ± 2.51	10.23 ± 2.31	0.979	0.337	NS

Data was expressed as SD: Standard deviation, BMI: Body Mass Index, p-value: probable value, NS: Not significant, t-value: t-test value, Kg/ m^2: Kilogram/ meter^2

Table 2. Mean ± SD, t and p value of Nausea, Vomiting, Dry heaviness, and Total scoring of frequency pre, post 1st and post 2nd treatment at both groups.

Variables			Group A	Group B	Mean Difference	t-value	p-value
			mean ± SD	mean ± SD			
Nausea	**Pre-test**		3.57 ± 0.94	3.92 ± 0.95	0.35	0.966	0.344
	Post-test	**1st**	2.57 ± 0.94	3.38 ± 1.04	0.81	2.133	0.043
		2nd	2.14 ± 0.95	2.92 ± 0.95	0.78	2.129	0.043
	Mean Difference	**1st**	1	0.54			
		2nd	1.43	1			
	% of improvement	**1st**	28 %	14 %			
		2nd	40 %	26 %			
	t-value	**1st**	9.54	2.941			
		2nd	7.071	5.1			
	p-value	**1st**	3.1 E -7	0.012			
		2nd	8.4 E -6	0.0003			
Vomiting	**Pre-test**		3.29 ± 0.83	3.77 ± 1.09	0.48	1.304	0.204
	Post-test	**1st**	2.71 ± 0.83	3.46 ±1.05	0.75	2.064	0.049
		2nd	2.36 ± 0.84	3.15 ± 0.99	0.79	2.262	0.033
	Mean Difference	**1st**	0.58	0.31			
		2nd	0.93	0.62			
	% of improvement	**1st**	18 %	8 %			
		2nd	28 %	16 %			
	t-value	**1st**	2.828	2.309			
		2nd	4.192	3.411			
	p-value	**1st**	0.014	0.039			
		2nd	0.001	0.005			
Dry heaviness	**Pre-test**		3.14 ± 0.95	3.15 ± 0.9	0.01	0.031	0.976
	Post-test	**1st**	2.64 ±1.01	2.92± 0.95	0.28	0.74	0.466
		2nd	2.07 ± 0.92	2.85 ± 0.9	0.78	2.215	0.036
	Mean Difference	**1st**	0.5	0.23			
		2nd	1.07	0.3			
	% of improvement	**1st**	16 %	7 %			
		2nd	34 %	10 %			
	t-value	**1st**	2.876	1.897			
		2nd	5.491	2.309			
	p-value	**1st**	0.013	0.082			
		2nd	0.0001	0.0395			
Total scoring of frequency	**Pre-test**		10 ± 2.11	10.85 ± 2.51	0.85	0.95	0.351
	Post-test	**1st**	7.93 ± 2.4	9.77 ± 2.65	1.84	1.894	0.07
		2nd	6.64 ± 2.27	8.92 ± 2.53	2.28	2.466	0.021
	Mean Difference	**1st**	2.07	1.08			
		2nd	3.36	1.93			
	% of improvement	**1st**	21%	10%			
		2nd	34%	18%			
	t-value	**1st**	6.792	7.867			
		2nd	12.459	7.268			
	p-value	**1st**	1.3 E -5	4.5 E -6			
		2nd	1.3 E -8	9.9 E -6			

Table 3. Mean ± SD, t and p value of Quality of Life pre, post 1st and post 2nd treatment in both groups.

Variable			Group A	Group B	Mean Difference	t-value	p-value
			mean ± SD	mean ± SD			
Quality of Life	**Pre-test**		5.36 ± 1.39	4.31 ± 1.93	1.05	1.629	0.116
	Post-test	**1st**	6.93 ±1.07	5.54 ±1.98	1.39	2.289	0.031
		2nd	7.86 ± 0.95	6.08 ± 1.66	1.78	3.459	0.002
	Mean Difference	**1st**	1.57	1.23			
		2nd	2.5	1.77			
	% of improvement	**1st**	29%	29%			
		2nd	47%	41%			
	t-value	**1st**	7.778	7.407			
		2nd	9.946	10.647			
	p-value	**1st**	3 E -6	8.2 E -6			
		2nd	1.9 E-7	1.8 E -7			

and the tighter connective tissue. As a result of the stimulating effects of this irritation, a normalization of the metabolism occurs. The normalization then starts the self-healing process of the body [35, 36], and based on the Chi concept, applying pressure to this points inhibits abnormal energy slowly and eases symptoms linked to the pressure point [24] and this provides the justification for this study results concerning acutaping.

Regarding the considerable improvement in quality of life in favour of group A which is in line with studies that NVP has a major detrimental influence on women's lives; 38 research that examined its effects on daily functioning, work, social interactions, and health-related quality of life were included in a comprehensive review of the literature conducted between 1999 and 2011[56]. According to the review, NVP lowers quality of life and has detrimental effects on social, professional, and household functioning [56]. The findings indicate that the impact of NVP increases with the severity of its symptoms. Additionally, the literature has reported a higher chance of comorbidity, particularly when heartburn and reflux issues are present together with depressive symptoms [57] putting the women under considerably greater burden. So this improvement can be explained by the decrease in nausea and vomiting severity which lead to improvement in QoL.

In regard to control group B that revealed less improvements to quality of life, overall frequency score, dry heaviness, nausea, and vomiting. Traditional medical treatment (doxylamine and pyridoxine) provide independent anti-nauseate and antiemetic activity [58, 59] explaining the results for its effect on control group.

Conclusion: Acutaping is a new alternative treatment method that can be used for NVP decreasing its frequency and improving quality of life of pregnant women, current study findings could be valuable for whom are seeking non-invasive, not painful and cheap treatment methods for NVP

Limitations

Application of acutaping done in short period time due to its novelty.

No conflict of interest

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