The Efficacy of Ginger in Prevention of Post-operative Nausea and Vomiting after Outpatient Gynecological Laparoscopy

DENSAK PONGROJPAW, MD*,
CHAROENCHAI CHIAMCHANYA, MD*

Abstract

Objective : To study the efficacy of ginger in prevention of nausea and vomiting after outpatient gynecological laparoscopy.

Study design : Double blind randomized controlled trial

Setting : Department of Obstetrics and Gynecology, Thammasat Hospital, Faculty of Medicine, Thammasat University.

Material and Method : From January,2001 - December, 2001. 80 patients who underwent outpatient gynecological laparoscopy were randomly allocated into group A (n = 40) and group B (n = 40). The patients in group A received 2 capsules of ginger (1 capsule contain 0.5 g of ginger powder) 1 h before the procedure while the patients in group B received the placebo. The visual analogue nausea scores (VANS) and vomiting times were evaluated at 2, 4 and 24 hours after operation.

Result : There was a significant difference in the incidence of the nausea between group A [12 (30%)] and group B [23 (57.50%)] The VANS was lower in group A than in group B at 2 and 4 hours ($p < 0.05$). No difference of VANS at 24 hours was found in both groups. Incidence and frequency of vomiting in group A were lower than group B but there were not statistically different.

Conclusion : From our data, ginger is effective in prevention of nausea after outpatient gynecological laparoscopy.

Key word : Laparoscopy, Ginger, Nausea, Vomiting

PONGROJPAW D & CHIAMCHANYA C
J Med Assoc Thai 2003; 86: 244-250

* Department of Obstetrics and Gynecology, Faculty of Medicine, Thammasat University, Pathum Thani 12120, Thailand.

Nausea and vomiting are common complications after outpatient laparoscopic surgery with the incidence of 25-40 per cent[1-3]. Although most cases are not severe, some cases can cause serious complications, for example electrolyte imbalance, aspiration of gastric content and prolonged hospitalization etc. Most of the currently available antiemetics act as central dopaminergic receptors and may produce extrapyramidal and sedative side effects[2,4]. These side effects are particularly undesirable in day case patients.

Ginger (*Zingiber officinale Rosc.*) has recently been studied for antiemetic effects. Several reports found that ginger powder has significant effectiveness for treating morning sickness and hyperemesis gravidarum with no adverse effects[5-8]. Ginger is also used for prevention of post-operative nausea and vomiting after major gynecological surgery and it was found that ginger was statistically significant in the prevention of nausea and vomiting compared to a placebo[9]. Philips et al[2] studied the effect of ginger compared to metoclopramide and a placebo in prevention of nausea and vomiting after day case laparoscopic surgery and found that in patients who received ginger had a lower incidence of nausea and vomiting with no difference in side effects. However, Arfeen et al[10] found that ginger was ineffective in reducing the incidence of post-operative nausea and vomiting in gynecological laparoscopic surgery.

MATERIAL AND METHOD

The present study was a prospective, double blind randomized controlled trial. The investigation was approved by the Medical Ethics Comitte of the Faculty of Medicine, Thammasat University and each patient gave written, informed consent. The study also received grant support from Thammasat University.

Between January, 2001 and December, 2001, 80 patients aged between 20-50 years scheduled for day case laparoscopy were included. The patients were not studied if they were pregnant, had other underlying diseases such as hepatitis or gastrointestinal disease, had ingested alcohol, opioids or antiemetics in the 24 hours before surgery. The patients who failed laparoscopic surgery and needed exploratory laparotomy were excluded as well.

The patients were allocated into two groups by random allocation. Group A received two capsules of ginger (each capsule contained powdered ginger 0.5 g). Group B received two capsules of placebo (each capsule contained 0.5 g lactose). All capsules were prepared by Khao-la-or laboratories Ltd, Part. The capsules were identical in size, colour, taste and smell. The capsules were swallowed with 30 ml water 1 hour

Table 1. Demographic data of the patients in both groups.

	Treatment				P-value
	Ginger (n = 40)	%	Placebo (n = 40)	%	
Age (years)					
20-34	27	67.5	22	55.0	0.358
35-50	13	32.5	18	45.0	
Weight (Kg)					
Mean ± SD	53.14 ± 7.03		52.29 ± 5.24		0.54
Occupation					
Employee	21	52.5	22	55.0	
Government official	9	22.5	11	27.5	
Trader	4	10.0	0		
Housewife	6	15.0	7	17.5	
Education					
Elementary	3	7.5	3	7.5	
Junior highschool	0	0	3	7.5	
Highschool	19	47.5	13	32.5	
Bachelor/graduate	18	45.0	19	47.5	
Post-graduate	0	0	2	5.0	

before induction of anesthesia. The patients received no other premedication.

A similar anesthetic technique was employed throughout. Medication which can cause nausea and vomiting for example morphine, was not used in the study. At the end of the procedure neuromuscular blockade was reversed with neostigmine and atropine. The patients were assessed at 2,4 and 24 hours after the complete procedure.

Nausea was recorded on a 10 cm linear analogue scale which ranged from 0 for no nausea at all to 10 for the worst nausea. Number of vomiting episodes and other side effects for example itching, abdominal pain and fever etc were recorded. For the patients who were discharged on the same day, the record at 24 hours was done by telephone.

Data were analyzed using chi-square test, *t*-test, Fisher's exact test and ANOVA test. P-valve < 0.05 was considered statistically significant.

RESULTS

The demographic data were similar in both groups (Table 1). The type and duration of surgery were comparable. There were no statistically significant differences between the two groups (Table 2). Twelve patients (30%) in group A reported nausea compared to twenty-three (57.50%) in group B ($p < 0.05$). Three patients (7.50%) in group A and eight

Table 2. Type of operation and operating time.

	Treatment				P-value
	Ginger (n = 40)	%	Placebo (n = 40)	%	
Type of operation					
Lap Dx	34	85.0	32	80.0	
Lap cystectomy	5	12.5	7	17.5	
Lap TL	1	2.5	1	2.5	
Operating time (min)					
Mean ± SD	71.75 ± 46.39		69.13 ± 50.15		0.809

Note : Lap Dx = laparoscopic diagnosis ± dye insufflation ± electric cauterization
Lap TL = tubal ligation

Table 3. Post-operative number of nausea, vomiting, use of antiemetic and analgesia.

	Treatment				P-value
	Ginger (n = 40)	%	Placebo (n = 40)	%	
Antemetic					
No	37	92.5	32	80.0	0.194
Yes	3	7.5	8	20.0	
Analgesia					
No	3	7.5	1	2.5	0.615
Yes	37	92.5	39	97.5	
Nausea					
No	28	70.0	17	42.5	0.013
Yes	12	30.0	23	57.5	
Vomiting					
No	33	82.5	28	70.0	0.189
Yes	7	17.5	12	30.0	
Frequency of vomiting (time)					
1	5	71.42	7	58.33	
2	1	14.29	2	16.67	
3	0	0	2	16.67	
4	1	14.29	0	0	
5	0	0	1 (8.33		

patients (20%) in group B received antiemetics ($p > 0.05$). Thirty-seven (92.50%) in group A and thirty-nine patients (97.50%) in group B requested analgesia ($p > 0.05$) (Table 3). Visual analogue scores of nausea (VANS) at 2 and 4 h after operation were lower in group A compared to group B ($p < 0.05$) (Table 4). After adjusting VANS for operative time, VANS at 2 and 4 h was still lower in group A compared to group B ($p < 0.05$), but there was no statistical difference of VANS at 24 h in both groups (Fig. 1, Table 5). Seven patients (17.50%) in group A and twelve patients (30%) in group B had vomiting but there was no statistical difference (Table 3). The authors found only one side effect in the study, which was abdominal discomfort. There were no statistical differences in side effects at 2,4 and 24 h in both groups (Table 6).

DISCUSSION

Post-operative nausea and vomiting are major causes of admission after outpatient surgery, making it necessary for hospitalization after operation[3]. Antiemetics without sedative and extrapyramidal effects are required for these patients. Ginger, known scientifically as Zingiber officinale[11], is a perennial native to many Asian countries. The aromatic and carminative properties of ginger and its possible absorbent properties suggest its action is on the gastrointestinal tract itself[8-12]. The authors were interested to find out if ginger could reduce nausea and vomiting after operation.

In the present study, oral administration of 1 g of ginger reduced the incidence of nausea by 50 per cent, similar to Phillips et al[2] but the authors found a higher incidence of nausea (57.50%) in the placebo group. Fewer patients in the ginger group had vomiting than in the placebo group but there was no statistical difference. The need for post-operative antiemetics was less in the ginger group but there was also no statistical difference.

Post-operative nausea and vomiting can be caused by several factors for example underlying disease, anesthetic medication, type of operation and operative time etc. In the present study the authors controlled these factors for both groups. In additional to other studies[2,9], the authors also compared the means of VANS adjusted for the operating time to control the effect of the operating time. The VANS

Table 4. Visual analogue nausea score (VANS) of both groups at 0, 2, 4 and 24 h.

	Treatment (n = 40)	Mean	P-value
VANS at T 0	Ginger	0	
	Placebo	0	
VANS at T 2	Ginger	1.2750	0.013
	Placebo	2.900	
VANS at T 4	Ginger	1.3750	0.035
	Placebo	2.700	
VANS at T 24	Ginger	0.075	0.482
	Placebo	0.015	

Table 5. Statistical test for the means of VANS between ginger and placebo cross the time after adjusting for operation time.

Time (hour)	Ginger Mean	Placebo Mean	Difference Mean ± SE	95% CI. Of the means difference Lower Bound	Upper Bound	P-value
0	0.000	0.000	0.000 ± 0	0.000	0.000	
2	1.259	2.916	1.656 ± 0.628	0.405	2.908	0.01
4	1.357	2.718	1.361 ± 0.603	0.160	2.562	0.027
24	0.075	0.150	0.076 ± 0.108	0.139	0.290	0.482

Using ANOVA for repeated measure adjusted for operating time

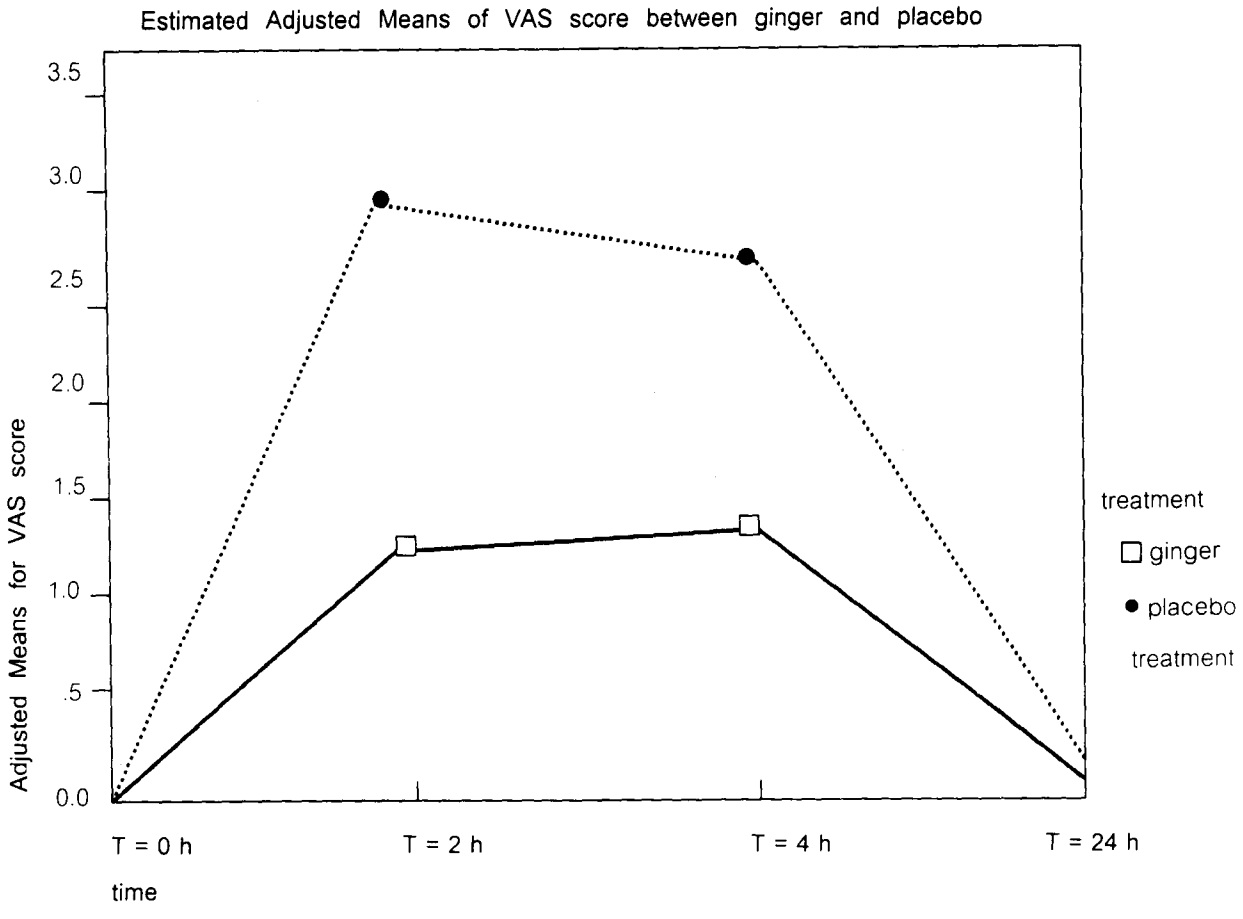

Fig. 1. Comparison of the means of VANS adjusted for operating time between ginger and placebo by times.

Table 6. Side effect (abdominal discomfort).

	Treatment				P-value
	Ginger	%	Placebo	%	
Side effect after 2 h					
No	37	92.5	35	87.5	0.712
Yes	3	7.5	5	12.5	
Side effect after 4 h					
No	36	90.0	33	82.5	0.516
Yes	4	10.0	7	17.5	
Side effect after 24 h					
No	39	97.5	34	85.0	0.108
Yes	1	2.5	6	15.0	

was still statistically different in both groups at 2 and 4 h. In the present study, no toxicity in ginger was found as in previous reports[5-8] and post-operative side effects were similar to the placebo group.

There were more patients who had nausea and vomiting in the present study than previous study [2]. The authors think that a prolonged operative time was an important cause. The operative time in the

present study was longer than other studies[2,9,10]. Experience, limitation and problems from instruments seemed to be the factors. A previous study by Arfeen et al[10] found that ginger is ineffective in preventing post-operative nausea and vomiting. However, the authors think that Arfeen's study assessed the patients only one time at 3 h post-operative and used diazepam for premedication. This drug may cause a problem for patients after the procedure when asked to give the correct information.

There are numerous methods for assessing post-operative nausea and vomiting. The authors used VANS as the method of choice. Visual analogue score has been well accepted as a standard for assessment in many studies[7,8].

In conclusion, it was found that ginger significantly reduced the incidence of post-operative nausea compared to placebo and had no side effects. Further work on the use of ginger to prevent nausea and vomiting in other operations such as major gynecologic operation, post-partum tubal ligation etc are required.

ACKNOWLEDGEMENTS

The authors wish to thank Assistant Profressor, Dr. Kamal Kuman Pawa, Dean of the Faculty of Medine, Thammasat University who initiated the use of ginger in the patients. We also wish to thank Assistant Profressor, Dr. Sakol Manusook, Dr. Chatchai Treetampinich and Dr. Paruhus Torudom, Department of Obstetrics and Gynecology, Faculty of Medicine, Thammasat University for their patients used in the study. Finally, we wish to thank all the women who voluntarily participated in the study.

(Received for publication on November 20, 2002)

REFERENCES

1. Nzoghe NP, Ogowet IN, Pither S, Ngaka ND. Ambulatory laparoscopic gynecological surgery in African : Feasibility. J Gynecol Obstet Bilo Reprod 2001; 30: 462-6.
2. Phillips S, Ruggier R, Hutchinson SE. Zingiber officinale (ginger) and antiemetic for day case surgery. Anaesthesia 1993; 48: 715-7.
3. Hedayati B, Fear S. Hospital admission after day-case gynaecological laparoscopy. Br J Anaesth 1999; 83: 776-9.
4. Palazzo MGA, Strunin L. Anesthesia and emesis II : Prevention and mangement. Canadian Anaesthetist' Society Journal 1984; 31:407-15.
5. Wilkinson JM. What do we know about herbal morning sickness treatments? A literature survey. Midwifery 2000; 16: 224-8.
6. Langer E, Greifenberg S, Gruenwald J. Ginger : History and use. Adv Ther 1998; 15: 25-44.
7. Vutyavanich T, Kraisarin T, Ruangsri R. Ginger for nausea and vomiting in pregnancy randomized, double-masked, placebo-controlled trial. Obstet Gynecol 2001; 97: 577-82.
8. Fisher-Rasmussen W, Kjaer SK, Dahl C, Asping U. Ginger treatment of hyperemesis gravidarum. Eur J Obstet Gynecol Reprod Biol 1990; 38: 19-24.
9. Bone ME, Wilkinson DJ, Yong JR, McNeil J, Charlton S. Ginger route a new antiemetic. The effect of ginger route an post-operative nausea and vomiting after major gynaecological surgery. Anaesthesia 1990; 45: 669-71.
10. Arfeen Z, Owen H, Plummer JL, Ilsley AN, Sorby-Adams RA, Doecke CJ. A double-blind randomized controlled trial of ginger for the prevention of post-operative nausea and vomiting. Anaesth Intensive Case 1995; 23: 449-52.
11. Tyler VE, Foster S. Herbs and phytomedicinal products. In: Covington TR, Beradi RR, Young LL, eds. Handbook of nonprescription drugs. 11th ed. Washington DC : American Pharmaceutical Association, 1996: 697.
12. Murphy DA. Alternative therapies for nausea and vomiting of pregnancy. Obstet Gynecol 1998; 91: 149-55.

ประสิทธิภาพของขิงในการป้องกันอาการคลื่นไส้อาเจียนภายหลังการผ่าตัดผู้ป่วยนอกด้วยกล้องส่องช่องท้องทางนรีเวช

เด่นศักดิ์ พงศ์โรจน์เผ่า, พบ, เจริญไชย เจียมจรรยา, พบ**

วัตถุประสงค์ : เพื่อศึกษาประสิทธิภาพของขิงในการป้องกันอาการคลื่นไส้ อาเจียนภายหลังการผ่าตัดผู้ป่วยนอกด้วยกล้องส่องตรวจช่องท้องทางนรีเวช

รูปแบบการวิจัย : Double blind randomized controlled trial

สถานที่ : สาขาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์ มหาวิทยาลัยธรรมศาสตร์

วิธีดำเนินการวิจัย : ศึกษาตั้งแต่ มกราคม 2544-ธันวาคม 2544 ผู้ป่วยที่ต้องได้รับการผ่าตัดด้วยกล้องส่องตรวจช่องท้องทางนรีเวช แบบผู้ป่วยนอก จำนวน 80 ราย อายุ ระหว่าง20-50 ปี ได้ทำการแบ่งกลุ่มแบบสุ่ม เป็น 2 กลุ่ม ๆ ละ 40 ราย กลุ่ม A จะได้รับยาขิง 2 แคปซูล (1 แคปซูลประกอบด้วยขิง 0.5 กรัม) 1 ชั่วโมงก่อนการผ่าตัด และ กลุ่ม B จะได้รับยาหลอก ประเมิน Visual analogue nausea score (VANS) จำนวนครั้งที่อาเจียน และผลข้างเคียง ที่เวลา 2, 4 และ 24 ชั่วโมงหลังการผ่าตัด

ผลการวิจัย : จำนวนผู้ป่วยที่มีอาการคลื่นไส้ภายหลังการผ่าตัดในกลุ่มที่ได้รับยาขิง น้อยกว่าในกลุ่มที่ได้รับยาหลอกอย่างมีนัยสำคัญทางสถิติ 12 ราย (30%) เทียบกับ 23 ราย (57.5%) ผู้ป่วยกลุ่มที่ได้รับยาขิง มีค่า VANS ที่ 2 และ 4 ชั่วโมง ต่ำกว่าในกลุ่มที่ได้รับยาหลอก อย่างมีนัยสำคัญทางสถิติ แต่ที่เวลา 24 ชั่วโมง ไม่แตกต่าง จำนวนผู้ป่วยและจำนวนครั้งที่อาเจียนในกลุ่มที่ได้รับยาขิง มีน้อยกว่ากลุ่มที่ได้รับยาหลอก แต่ไม่แตกต่างอย่างมีนัยสำคัญทางสถิติ

สรุป : จากการศึกษา พบว่าขิงมีประสิทธิภาพในการป้องกันอาการคลื่นไส้ ภายหลังการผ่าตัดด้วยกล้องส่องช่อง-ท้องทางนรีเวช แบบผู้ป่วยนอก

คำสำคัญ : กล้องส่องช่องท้อง, ขิง, คลื่นไส้, อาเจียน

เด่นศักดิ์ พงศ์โรจน์เผ่า, เจริญไชย เจียมจรรยา
จดหมายเหตุทางแพทย์ ฯ 2546; 86: 244-250

* ภาควิชาสูติศาสตร์-นรีเวชวิทยา, คณะแพทยศาสตร์ มหาวิทยาลัยธรรมศาสตร์, ปทุมธานี 12120