



## ABILITY OF GINGER IN AMELIORATING CHEMOTHERAPY INDUCED NAUSEA IN HEMATOLOGICAL AND SOLID MALIGNANCIES

**Mathur Ashwin\***

Professor, Department of Medicine, S.M.S. Medical College, Jaipur \*Corresponding Author

**Agarwal VK**

Post Graduate Student, Department of Medicine, S.M.S. Medical College, Jaipur

### ABSTRACT

**Aims and Objectives:** Effect of ginger on chemotherapy induced side effects were assessed by complete blood counts, renal function test, liver function test, grading of nausea, vomiting, mucositis and febrile neutropenia in patient of hematological and solid malignancies.

**Materials and Methods:** This is a **Observational case control study** in which 40 **Cases** received **chemotherapy plus standard antiemetics plus ginger** and 40 **Controls** received **chemotherapy plus standard antiemetics only**.

Patients were randomized by computer generated random number table and ginger was started in dose of **1.5 gm/day in three divided doses** from first day of chemotherapy up to 4 days.

All the cases were evaluated in follow-up visits at 1, 2 & 4 week.

**Results:** **Statistically significant effects were observed in improvement of chemotherapy induced Nausea in patients. No significant differences were found in hemoglobin, total leukocyte count, platelet count, blood urea, s. creatinine, total bilirubin, SGOT, SGPT, in grading of vomiting, oral mucositis and febrile neutropenia.**

**Conclusions:** In this study authors conclude that ginger significantly reduces chemotherapy induced nausea.

**KEYWORDS** : QOL- Chemotherapy, Nausea

### INTRODUCTION:

**Ginger** is the rhizome of the plant *Zingiber officinale*, ( derive from the Greek, "zingiberis")<sup>1</sup>: consumed as a delicacy, medicine or spice. Characteristic odor and flavour of ginger is caused by a mixture of zingerone, shogaols and gingerols. In laboratory animals, the gingerols increase the motility of the gastrointestinal tract and had analgesic, sedative, antipyretic and antibacterial properties<sup>(2)</sup> Ginger was found to be more effective than placebo for treating nausea caused by seasickness, morning sickness and chemotherapy.<sup>(3,4,5,6)</sup>

Chemotherapy primarily affects normally dividing cells: therefore side effects of chemotherapy are Bone marrow suppression, Lymphoreticular tissue suppression, stomatitis, mucositis, gastrointestinal symptoms like nausea, vomiting, diarrhea, shedding of mucosa, hemorrhages, alopecia, oligospermia, amenorrhea, teratogenesis.

### MATERIAL AND METHOD:

It is a Hospital based Observational case control study, conducted at Medical OPD and wards, Leukemias Lymphoma Clinic at Birla Cancer Centre, S.M.S. Hospital, Jaipur over a period of 12 months.

**Cases** were selected as newly diagnosed age and sex matched 20 patient of Hematological Malignancies & 20 patient of solid tumors receiving **chemotherapy plus standard antiemetics plus ginger** and **Controls** were selected as newly diagnosed age and sex matched 20 patients of Hematological Malignancies & 20 patients of solid tumors receiving **chemotherapy plus standard antiemetics only**.

Group A: receiving chemotherapy plus standard antiemetics plus ginger

- A1: 20 patients of Acute Leukemias
- A2: 20 patients of solid malignancies

Group B: receiving chemotherapy plus standard antiemetics only.

- B1: 20 patients of Acute Leukemias
- B2: Patients of solid malignancies

### Exclusion criteria:

- Patients who had completed chemotherapy/radiotherapy,
- Unable to give informed consents
- Allergic/intolerant to Ginger

- Having severe cardiovascular, hepatic or renal disease
- Having uncontrolled infection
- Pregnant patients

Patients were randomized by computer generated random number table into both groups. Ginger was started in dose of 1.5 gm/day in three divided doses from first day of chemotherapy and up to 4 days. All the cases were evaluated in follow-up visits at 1(baseline), 2 & 4 week by routine blood investigations and clinical grading of nausea, vomiting, oral mucositis and febrile neutropenia was assessed.

### Data analysis:

The qualitative data were expressed in proportion and percentages and the quantitative data expressed as mean and standard deviations. The difference in proportion was analysed by using chi square test and the difference in means were analyzed by using student T Test. Significance level for tests were determined as 95% (P<0.05).

### Observation:

**TABLE: 1 Comparison of Nausea in Group A1 & B1**

Nausea		SCORE					Total	P Value
		1	2	3	4	5		
		No (%)	No (%)	No (%)	No (%)	No (%)		
Baseline	A1	9 (45)	7 (35)	4 (20)	0	0	20	0.939
	B1	8 (40)	8 (40)	4 (20)	0	0	20	NS
2 weeks	A1	15 (78.9)	3 (15.8)	1 (5.3)	0	0	19	<b>0.035</b>
	B1	7 (36.8)	8 (42.1)	4 (21.1)	0	0	19	<b>S</b>
4 weeks	A1	16 (84.2)	3 (15.8)	0 (0)	0	0	19	<b>0.019</b>
	B1	8 (42.1)	8 (42.1)	3 (15.8)	0	0	19	<b>S</b>

**Table: 2 Comparison of Nausea in Group A2 & B2**

Nausea		SCORE					Total	P Value
		1	2	3	4	5		
		No (%)	No (%)	No (%)	No (%)	No (%)		
Baseline	A2	8 (40)	5 (25)	7 (35)	0	0	20	0.92
	B2	10 (50)	5 (25)	5 (25)	0	0	20	NS
2 weeks	A2	15 (78.9)	3 (15.8)	1 (5.3)	0	0	19	<b>0.028</b>
	B2	7 (36.8)	7 (36.8)	5 (26.3)	0	0	19	<b>S</b>
4 weeks	A2	15 (78.9)	4 (21.1)	0 (0)	0	0	19	<b>0.024</b>
	B2	7 (36.8)	10 (52.6)	2 (10.5)	0	0	19	<b>S</b>

### DISCUSSION AND RESULTS:

In group A1 v/s B1 and group A2 v/s B2 at 1, 2 and 4 weeks, no significant difference was found in the blood picture or biochemical parameters.

However, statistically significant difference was observed in the grading of Nausea in patients of both groups.

In 2009, **J. L. Ryan et al**<sup>(7)</sup> conducted a multi-site, phase II/III randomized, placebo-controlled, double-blind clinical trial to assess the efficacy of ginger for chemotherapy-related nausea in cancer patients at the University of Rochester, and found positive results.

**Panahi Y et al**<sup>(8)</sup> evaluated the effect of ginger on acute and delayed chemotherapy-induced nausea and vomiting in a pilot, randomized, open-label clinical trial.

In 2011, **Pillai et al**<sup>(9)</sup> evaluated ginger capsules and placebo capsules as an additional antiemetics in a double blind randomized study and results of these all study also support our study.

**CONCLUSION:** It has been demonstrated in clinical studies that daily intake of ginger in a dose of 1.5g per day (500mg three times a day), is nontoxic and well tolerated. This study concludes that ginger **significantly reduces the nausea** while it has no effect on the blood picture or biochemical parameters.

This study is significant as Ginger in the dose of 500 mg three times a day can significantly reduce Nausea and improve the quality of life of patients of Hematological and Solid malignancies on chemotherapy

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