IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

"A QUASI EXPERIMENTAL STUDY ON EFFECTIVENESS OF ACUPRESSURE ON CHEMOTHERAPY INDUCED NAUSEA VOMITING(CINV) IN CHILDREN FROM SELECTED HOSPITAL IN A METROPOLITAN CITY"

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Abstract:

Background: Childhood cancer has a significant impact on pediatric medicine. Nausea and vomiting are common problems during chemotherapy cycles. It sometimes lasts for several days after the chemotherapy treatment stops, but the effects of chemotherapy vary with each child and depend on the dose the child receives. Without effective prophylaxis, severe and protracted nausea and vomiting may result in dehydration, electrolyte imbalance, malnutrition, and increased frequency of hospitalization. The primary factor influencing the severity and frequency of CINV is the emetic potential (emetogenicity) of the individual cytotoxic agent. The emetic potential refers as the intrinsic capacity of a chemotherapy agent to produce an emetic episode in a patient receiving the agent. Aim and objective: A study was planned to assess the effectiveness of acupuncture on chemotherapy induced nausea vomiting (CINV) in children. And associate the level of CINV with selected clinical variables in childrens. Material and method: A Quasi experimental pre and posttest control group design used for this study. The study was conducted on 60 the children with CINV from a selected hospital. The data gathering technique used was non probability purposive sampling. Results: The analysis and interpretation revealed that there is statistically significant reduction in the CINV level in the experimental group would be beneficial to create awareness among the health team members and the caregivers to apply acupressure as a standard of care. Conclusion: The finding of the study showed that, the experimental group would be beneficial to create awareness among the health team members and the caregivers to apply acupressure as a standard of care.

Index Terms **– Study, Effectiveness, Acupressure, Chemotherapy Induced Nausea Vomiting, Children.**

I. Introduction

Cancer is a leading cause of death for children and adolescents worldwide. According to the Indian Cancer Society, it is estimated that about 50,000 children and adolescents aged 0 to 19 years are diagnosed with cancer each year in India. Cancer in children constitutes 5.5% of total cancer cases in India according to the Indian Council for Medical Research. Cancer is a broad term as it describes the disease that results when cellular changes cause the uncontrolled growth and division of cells. Some types of cancer cause rapid cell growth, while others cause cells to grow and divide at a slower rate. Certain forms of cancer result in visible growths called tumors, while others, such as leukemia. Current data suggest that approximately 10% of all children with cancer have a predisposition because of genetic factors. Cancer is prevalent all over the world among developed and developing nations, as it affects both genders. Chemotherapy being mainstay in cancer management and is a general term for medications used to destroy or stop the growth of cancer cells. Chemotherapy works by interfering with the ability of cancer cells to divide and duplicate themselves. Chemotherapy can be given through the bloodstream to reach cancer cells all over the body, or it can be delivered directly to specific cancer sites. While killing off cancer cells, chemotherapy unavoidably cause damage to other healthy cells in the body. Chemotherapy Induced Nausea and Vomiting (CINV) is a highly unpleasant side effect and continues to be one of the most distressing symptoms in children undergoing chemotherapy. CINV can lead to complications and cause significant emotional and physical distress, disruptions to activities of daily living and influence the quality of life of the patient. CINV may be acute, anticipatory or delayed onset. Anticipatory nausea and emesis can be present before treatment is started in patients, depending on the patient's emotional distress or expectations.

II. Background of study

Childhood cancer has a significant impact on pediatric medicine. Nausea and vomiting are common problems during chemotherapy cycles. It sometimes last for several days after the chemotherapy treatment stops, but the effects of chemotherapy vary with each child and depend on the dose the child receives. Without effective prophylaxis, severe and protracted nausea and vomiting may result in dehydration, electrolyte imbalance, malnutrition, and increased frequency of hospitalization. The primary factor influencing the severity and frequency of CINV is the emetic potential (emetogenicity) of the individual cytotoxic agent. The emetic potential refers as the intrinsic capacity of a chemotherapy agent to produce an emetic episode in a patient receiving the agent. Chemotherapeutic drugs can cause nausea and vomiting by activating neurotransmitter receptors that are present in the area of the brain. These receptors are also found in the terminal ends of the vagal afferents near the enterochromaffin cells in the intestine, these afferent fibers transmit the stimuli to the brainstem, which processes the emetic reflex and sends efferent signals to organs and tissues to induce vomiting.

Statement of Problem: A Quasi-Experimental study on effectiveness of acupressure on chemotherapy induced nausea vomiting (CINV) in children from selected hospital in a metropolitan city.

Objectives of study:

1. To compare level of CINV after Acupressure and standard of care in children undergoing chemotherapy from experimental and control group respectively.
2. To associate the level of CINV with selected clinical variables in children.

Delimitations:

1.Children undergoing chemotherapy with CINV.
2.Children with age group from 6-12 years.

III. Research Methodology:

The research approach used in the study is a Quantitative quasi experimental approach. A true experimental approach except that the participants are not randomly assigned to the control and treatment groups. selection of subjects based on the characteristics and 7 days gaps between the two- chemotherapy regimen, objectives of the study and knowledge of the researcher about the population so as to complete the study in stipulated time frame. Modified Rhodes Index of Nausea Vomiting Scale used for assessing Nausea and vomiting.

3.1 Population and Sample:

The study was conducted among the 30 control and 30 experimental children with CINV from a selected hospital.

3.2 Data and Sources of Data

Data was collected by using Self report method non probability purposive sampling technique. The standardized Modified Rhodes Index of Nausea and Vomiting scale tool used for data collection.

3.3 Theoretical framework

The conceptual model for this study is based on Ernestine Weidenbach's the helping art of clinical nursing theory. Wiedenbech developed the theory in 1964 also known as Prescriptive theory: a situation producing theory. It directs action toward an explicit goal. According to this theory, the theorist believes that nursing is the practice of identification of a patient's need for help through observation of presenting behaviors and symptoms, exploration of the meaning of those symptoms with the patient, determining the cause(s) of discomfort, and determining the patient's ability to resolve the discomfort or if the patient has a need for help from the nurse or other healthcare professionals. Nursing primarily consists of identifying a patient's need for help. Ernestine Wiedenbech three components of the theory are central, intervention and realities. It has three factors: Central purpose (nurse's philosophy for care) Essential to the. Prescription or practice for the fulfillment of the central purpose, directive to activity. Realities in the immediate situation that influence the fulfillment of the central purpose.

IV. Results and Discussion

TABLE 4.1: DISTRIBUTION OF SUBJECTS ACCORDING TO THEIR AGE, GENDER AND CURRENT ACADEMIC YEAR OF CHILD

N=60

SN	Demographic	Control		Experiment	
		Frequency	Percentage	Frequency	Percentage
AGE					
1	6-8	16	53.33%	16	53.33%
2	9-10	5	16.67%	5	16.67%
3	11-12	9	30%	9	30%
GENDER					
1	Female	13	43.33%	11	36.67%
2	Male	17	56.67%	19	63.33%
CURRENT ACADEMIC YEAR OF CHILD					
1	1st – 2nd	9	30%	8	26.67%
2	3th – 4th	13	43.33%	14	46.66%
3	5th – 6th	8	26.67%	8	26.67%

Table 4.1 Explains distribution of the subjects according to their age and gender and current academic year of child. In the distribution of subject with regard to their age, both control & experimental group, subjects were matched with regard to the age. Majority of subjects 16(53%) were from 6-8 years of age, 9(30%) subjects were from 11-12 years and minimum subjects 5(16.6%) belonged to age group of 9-10 years in both experimental and control group. The distribution of the subjects according to their gender depicts that maximum subjects were male i.e. 19(63.3%) and the female constituted 11(36.67%) of total subjects in the experimental group. In control group it shows that most of subjects were male 17(56.67%) and the female constituted 13(43.33%) of total subjects. It is seen that maximum subjects were male in both the groups. With regard to distribution of subjects according to their current academic year of child the majority subjects from experimental group were studying in class 3rd-4th i.e. 14(46.6%), and with equal number of subjects were in the class of 1st-2nd and 5th–6th with 8(26.6%). Similar trend was seen even in control group that maximum children were studying in 13(43.3%)3rd -4th and 9(30%) children were studied in 1st -2nd class and remaining 8 (26.6%) children were in the class 5th-6th.

TABLE 4.2: DISTRIBUTION OF THE SUBJECTS ACCORDING TO THE SELECTED CLINICAL VARIABLES

N=60

SN	Clinical Variables	Control		Experimental	
		Frequency	Percentage	Frequency	Percentage
TYPE OF CANCER					
1	Leukemia	23	76.67%	25	83.33%
2	Solid Tumor	7	23.33%	5	16.67%
HOSPITAL VISITS DUE TO CINV					
1	Never	26	86.67%	28	93.33%
2	Once	4	13.33%	2	6.67%
CYCLES OF CHEMOTHERAPY					
1	Less than Five	20	66.67%	23	76.67%
2	More Than Five	10	33.33%	7	23.33%
DRUG USED IN CHEMOTHERAPY					
1	Doxorubicin / Cytarabine	2	6.67%	1	3.33%
2	Doxorubicin /Methotrexate	4	13.33%	2	6.67%
3	Methotrexate	19	63.33%	21	70%
4	Methotrexate/ Cytarabine	5	16.67%	6	20%

Table 4.2 Represents the distribution of subjects according to their selected clinical variables. In relation to the type of cancer in experimental group among 30 subjects, maximum subjects 25(83.33%) had leukemia and remaining 5(16.67%) subjects had solid tumor. In control group among 30 subjects, maximum subjects 23(76.67%) had leukemia and remaining 7(23.33%) had solid tumor. Matching of the subjects based on the type of cancer was done by the researcher. The distribution of subjects according to their number of hospital visits due to CINV, the data shows that in experimental groups maximum subjects 28(93.3%) were never visits the hospital and remaining subjects 2(6.67%) were visited hospital once a time. In control group, the maximum subjects 26(86.6%) were never visited the hospital and remaining subjects 4(13.3%) were visited hospital once a time. Thus, it shows that maximum subjects were never visited the hospital for the side effects of chemotherapy in both experimental and control groups. The distribution of subjects according to their number of hospital visits due to CINV, the data shows that in experimental groups maximum subjects 28(93.3%) were never visits the hospital and remaining subjects 2(6.67%) were visited hospital once a time. In control group, the maximum subjects 26(86.6%) were never visited the hospital and remaining subjects 4(13.3%) were visited hospital once a time. Thus, it shows that maximum subjects were never visited the hospital for the side effects of chemotherapy in both experimental and control groups. In the distribution of subjects with regards to their chemotherapy drugs used, the data shows in control group, maximum subjects 19(63.33%) received methotrexate followed by 5(16.67%) subjects had received the combination of methotrexate and cytarabine. Few 4(13.33%) subjects received the methotrexate and doxorubicin and 2(6.67%) subjects received the doxorubicin and cytarabine. In experimental group, maximum subjects 21(70%) received the methotrexate followed by 6(20%) subjects received

methotrexate and cytarabine, 2(6.67%) subject received the methotrexate and doxorubicin,6(20%) subjects received methotrexate with cytarabine and 1(3.33%) subject received combination of doxorubicin and cytarabine. Thus, matching of the subjects based on the drug used in chemotherapy was done.

TABLE 4.3: ASSESSMENT OF PRE AND POST INTERVENTIONAL LEVEL OF CINV WITHIN THE EXPERIMENTAL AND CONTROL GROUP

N=60

SN	Group	Mean± SD	Median (IQR)	Range	DF	t value	P value
Experimental							
1	Pre	35.93±10.29	39(16)	16 - 51	29	4.286	0.0002
2	Post	28.90±8.37	30.50(14)	8-43			
Control							
1	Pre	40.10± 7.51	39(16)	16 - 51	29	1.276	0.2123
2	Post	38.77±4.82	40(5)	24 – 47			

Table 4.3 Represents the assessment of pre and post interventional level of CINV within the experimental and control group. The mean CINV score is 35.9±10.2 on the pre-test, whereas the mean CINV score is 28.9 ±8.37 on the post-test in the experimental group. In order to rule out presence of significance difference in pre and post score hypotheses is tested using paired t test. The calculated t value at 0.05 level of significance is 4.286 which is more than the table t value. Hence, we reject the null hypotheses and accept the alternate hypotheses as it shows a significance difference in the CINV score in pre and post score of experimental group. Therefore, it determines that acupressure is effective and it reduce the post interventional CINV score in the experimental group. In the control group, the mean CINV score is 40.1 with a standard deviation of ±7.5 on the pre-test, whereas the mean CINV score is 38.7 with a standard deviation of ±4.8 on the post test. Hypotheses is tested using paired t test. The calculated t value at 0.05 level of significance is 1.27 and it shows that no significant difference in pre and post score of CINV in control group. This suggests that acupressure helps in reduction of CINV as even the mean score of experimental group (28.9±8.3) is less than (38.7±4.8) control group.

Figure 4.1: Comparison of pre interventional score of CINV in experimental and control group.

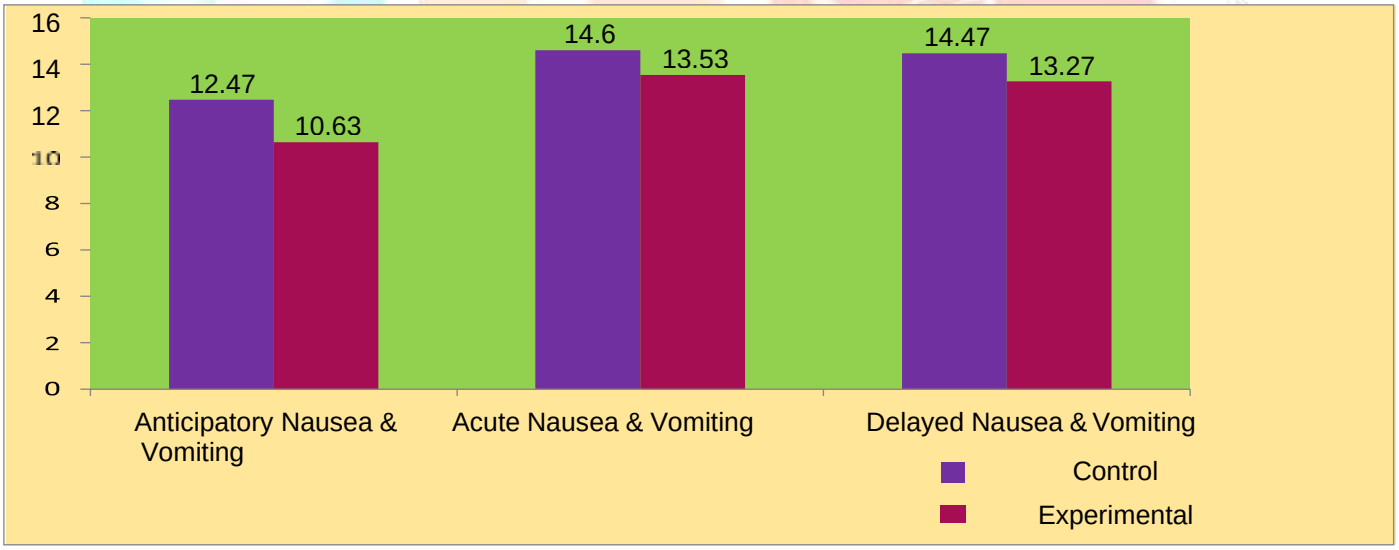

Figure 4.1 Represents the comparison of mean and standard deviation of pre-interventional level of CINV between the experimental group and control group. In experimental group (anticipatory) the pre-interventional level of CINV, the mean value is 10.6 with standard deviation is ±5.9 whereas in control group the mean value is 12.4 with the standard deviation ±4.6. The calculated t value at 0.05 level of significance is 1.983. In experimental group (acute) the pre-interventional level of CINV, the mean value is 13.5 with standard deviation is ±3.7 whereas in control group the mean value is 14.6 with the standard deviation ±3.2. The t value at 0.05 level of significance is 1.17. In experimental group (delayed) the pre-interventional level of CINV, the mean value is 13.2 with standard deviation is ±3.08 whereas in control group the mean value is 14.4 with the standard deviation ±1.9. The t value at 0.05 level of significance is 1.789. Hence it shows no significant difference in pre interventional CINV score in experimental and control group. Absence of significant differences in pre score of CINV initiating management of CINV. Hence, both groups were homogenous in terms of pre- interventional level of CINV.

TABLE 4.4 ASSOCIATION OF PRE-INTERVENTIONAL LEVEL OF CINV WITH TYPE OF CANCER

N=60

Source	Pre score				
	Sum of Squares	DF	Mean Square	F	P
Group	353.880	1	353.880	4.295	0.053
Type of Cancer	10.686	1	10.686	0.130	0.720
Group*Type of Cancer	94.448	1	94.448	1.146	0.289

Table 4.4 represents the association of pre- interventional level of CINV with the type of cancer. The two-way ANOVA test was applied to determine the association of pre interventional CINV with type of cancer. The p value is 0.053 in the main group (both experimental and control). However, since the p value is 0.720(<0.05) among type of cancer in the main effect. Also, the p value in the interaction effect between the type of cancer and the post interventional score is 0.289(<0.05**).** This establishes that there is no significant association of CINV pre score with type of cancer.

V. Acknowledgment

With sincere gratitude, the investigator wishes to acknowledge all those who have put their efforts in the making of this study. It was the contribution of many people, which helped in the successful completion of the study. I owe my heartfelt gratitude to those childrens. who have participated in this study and provide me all the information required for the completion of the project and without whom this project would have been incomplete.

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