An Experimental Study to Assess the Effectiveness of Molidrain Bag Vs Bottle Drain Upon Nursing Competency of Naso - Gastric Aspiration among Post Abdominal Surgery Patients at Selected Hospital in Chennai

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Abstract: *Introduction: Majority of the post - operative patients have Nasogastric tube aspiration. The bottle drains was used to collect the aspiration from the patient. This conventional method in which the bottle drain are used lead to frequent fall of the bottles due unstable base and less weight, this increases the chance of environmental contamination and ascending infection to the patient. The accurate measurement was impossible as the disposable water bottle does not contain the measuring levels. It was time consuming for the nurses to search the articles to start a nasogastric aspiration. This intended the researchers to develop a standard nasogastric aspiration bag. An effective brainstorming session with the Nursing team and the surgeons was conducted regarding an alternate method. A standard nasogastric aspiration bag, with infusion set, three way connector and Jerry can for continuous naso gastric aspiration was developed with the help of the vendor. Methodology: A true experimental post test only research design was used, the samples were selected by systematic random sampling that is every odd number sample were included in the molidrain group (30 samples) and every even number were included in the bottle drain group (30 samples). Demographic variable, Clinical variable proforma of the post abdominal surgery patients, nursing competency for nasogastric aspiration, the level of acceptability among the nurses regarding molidrain bag and bottle drain was assessed. Result: the nurses demonstrated non competency with bottle drain for nasogastric aspiration (70%) among post abdominal surgery patients where as all the nurses demonstrated high competency with the molidrain bag for the nasogastric aspiration among post abdominal surgery patients (100%). There was a statistically significant difference in nursing competency between the molidrain group (M=41.86, SD=4.33) and bottle drain group (M=10, SD=1.38) with t value of 37.05 at P <0.001. All the nurses had high acceptability towards molidrain bag for nasogastric aspiration (100%) while majority of the nurses had unacceptability towards bottle drain (70%). There was no significant association between the level of nursing competency of nasogastric aspiration and the demographic variables. Conclusion: The study findings revealed that the clinical skill is improved by the usage of molidrain bag, the bag facilitates accurate measurement and easy tubing connection, reduce time consumption, reduce spillage of content thus provide clean environment, easy observation of the drain content.*

Keywords: Effectiveness, molidrain, bottle drain, nursing, competency, post abdominal surgery, patients

1. Introduction

Nasogastric tubes (NGTs) have been around for a long time, with the first account of their insertion being in the seventeenth century. Their first use was solely for providing nutrition (Phillips, 2006) [1]. Currently, NGTs are also used for other indications such as the administration of medications, gastric decompression, or gastric irrigation. The postoperative patients require the nasogastric tube for gastric decompression. Nasogastric decompression improves patient comfort, minimizes or prevents recurrent vomiting, and serves as a means to monitor the progress or resolution of postoperative ileus and overview of management of mechanical small bowel obstruction in adults.

The Apollo cancer Institute provides intensive care and treatment to chronically ill patients where majority of the post - operative patients are having Nasogastric tube aspiration. Since, the conventional method resulted in to a great hurdle to both patients and healthcare professionals in terms of discomfort, additioal cost, and increased time consumption, exposure to infections and inaccurate measurement etc. The unavailability of standard aspiration bag raised many problems which interfered in patient care

and became a challenging task for the care givers. The conventional method in which the bottle drain was used was the disposable water bottles which frequently fall down due unstable base and less weight. This increases the chance of environmental contamination and ascending infection to the patient. The accurate measurement was impossible as the disposable water bottle does not contain the measuring levels. It was time consuming for the nurses to search the articles to start a nasogastric aspiration. This intended the researchers to develop a standard nasogastric aspiration bag, by using infusion set, three way connector and Jerry can for continuous naso gastric aspiration.

2. Methodology

A true experimental post test only research design was used in which the post abdominal surgery patients with molidrain bag were assigned to group I and patients with bottle drain for nasogastric aspiration were assigned Group II.

The research design is depicted as follows
Molidrain Group: R X1 O1
Bottle Drain Group: R X2 O1

O1 - Post test assessment of nursing competency of nasogastric aspiration with molidrain bag vs bottle drain among post abdominal surgery patients.

X1 - Post abdominal surgeries with molidrain for nasogastric aspiration.

X2 - Post abdominal surgeries with bottle drain for nasogastric aspiration.

R – Randomization: Every even number of post abdominal surgery patients were allotted to molidrain group and every odd number were allotted to bottle drain group.

Sample: The samples were selected by systematic random sampling that is every odd number sample were included in the molidrain group (30 samples) and every even number were included in the bottle drain group (30 samples).

The objective of the study was
1) To assess the level of nursing competency of nasogastric aspiration among post abdominal surgery patients with molidrain bag and bottle drain.
2) To determine the effectiveness of molidrain bag vs bottle drain for naso gastric aspiration by comparing the nursing competency scores of nasogastric aspiration among post abdominal surgery patients.
3) To assess the level of acceptability among the nurses regarding molidrain bag and bottle drain
4) To determine the association between the level of nursing competency of naso - gastric aspiration and the selected demographic variables of post abdominal surgery patients in molidrain bag group and bottle drain group.
5) To determine the association between the level of nursing competency of naso - gastric aspiration and the selected clinical variables variables of post abdominal surgery patients in molidrain bag group and bottle drain group.

The following hypotheses were tested
Ho1: There will be no significant difference in nursing competency of nasogastric aspiration among post abdominal surgery patients between molidrain bag group and bottle drain group.
Ho2: There will be no significant association between the level of nursing competency of nasogastric aspiration and the demographic variables of post abdominal surgery patients in molidrain group and bottle drain group.
Ho3. There will be no significant association between the level of nursing competency of nasogastric aspiration and the clinical variables of post abdominal surgery patients in molidrain group and bottle drain group.
Ho4. There will be no significant difference in level of acceptance of nurses regarding between molidrain bag and bottle drain for nasogastric aspiration among post abdominal surgery patients.

3. Data Collection Tool and Method

The instruments used to collect data were
- **Demographic variable proforma** of the post abdominal surgery patients (age, gender, habit of smoking, alcoholism, residential area, type of family and occupation)
- **Clinical variable proforma** of the post abdominal surgery patients (body mass index, history of hypertension, diabetes mellitus, COPD, renal disorder,

cancer, previous surgery, starting day of the ambulation and head end elevation)
- Structured observation check list to assess **nursing competency for nasogastric aspiration** (It includes 15 items such as patient comfort, easiness for mobilization, prevention of backflow of the aspiration content, content easy tubing connection, prevention of spillage of aspiration content, accurate calibration of drain, accurate measurement of drain, easy observation of drain (colour, consistency), facilitates continuous drainage, reduced time consumption, cost effectiveness, prevention of bad odour due to spillage, ease and safe disposal of the content, maintenance of closed system of practice and satisfaction of health care workers. Each component was scored as strongly agree - 3, agree - 2, disagree - 1, strongly disagree - 0)

Rating scale to assess the level of acceptability among the nurses regarding molidrain bag and bottle drain (The rating scale was developed by the investigator to assess the ten components of the acceptability among the nurses regarding molidrain bag and bottle drain for nasogastric aspiration for post abdominal surgery patients. Each component were rated on 4 point rating scale as rated as 4 - highly acceptable, 3 - acceptable, 2 - unacceptable, 1 - highly unacceptable)

4. Data Analysis

Table 1: Frequency and Percentage Distribution of Demographic Variables of Post Abdominal Surgery Patients

Demographic variables	Molidrain bag group (n=30)		Bottle drain group (n=30)	
	f	**%**	**f**	**%**
Age (in years)				
≤35	00	00	00	00
36 - 50	15	50	05	16.7
≥50	15	50	25	83.3
Gender				
Male	11	36.7	25	83.3
Female	19	63.3	05	16.7
Residence				
Urban	23	76.7	02	6.7
Semi Urban	07	23.3	27	90
Rural	00	00	01	3.3
Type of Family				
Single	02	6.7	00	00
Nuclear	12	40	30	100
Joint	16	53.3	00	00
Occupation				
Private	3	10	0	0
Government	17	23.3	29	96.7
Self employment	14	46.7	1	3.3
Unemployment	6	20	0	0

Table 2: Frequency and Percentage Distribution of Clinical Variables of Post Abdominal Surgery Patients.

Demographic variables	Molidrain bag group (n=30)		Bottle drain group (n=30)	
	f	%	f	%
BMI (category)				
≤ 18.5	02	07	00	00
18.5 - 25	28	93.3	28	93.3
25 - 30	00	00	02	06.7
≥ 30	06	00	00	00
Hypertension				

Yes	09	30	30	100
no	21	70	00	00
Diabetes Mellitus				
Yes	07	23.3	27	90
no	23	76.7	03	10
COPD				
Yes	00	00	01	03.3
no	30	100	29	96.7
Renal Disorder				

Yes	00	00	00	00
no	30	100	30	100
Cancer				
Yes	18	60	29	96.7
no	14	40	01	3.3
Elevation of head (in days)				
≤ 30°	18	60	18	60
≥ 30°	12	40	12	40

Table 3: Frequency and Percentage Distribution of Level of Nursing Competency of Nasogastric Aspiration among Post Abdominal Surgery Patients in Molidrain Group and Bottle Drain Group

Level of Competency	Non competent (≤15)		Moderately Competent (16 – 22)		Highly Competent (23 – 30)	
	f	%	f	%	f	%
Molidrain bag group (n = 30)	0	0	0	0	30	100
Bottle drain group (n = 30)	20	70	10	30	0	0

Table 4: Comparison of Mean and Standard Deviation of Nursing Competency of Nasogastric Aspiration among Post Abdominal Surgery Patients in Molidrain Group and Bottle Drain Group

S. No.	Category	Molidrain bag group (n = 30)		Bottle drain group (n = 30)		t value	p value
		M	SD	M	SD	M	SD
1.	Safe handling	14.16	1.205	4.00	0.45	43.208	0.000
2	Prevention of complication	11.13	1.27	2.033	0.71	33.970	0.000
3	Prevention of infection	11.00	1.31	2.633	0.66	31.100	0.000
4	Time and cost control	5.4	0.89	1.60	0.72	18.34	0.000
5	Total	41.86	4.33	10	1.38	37.05	0.000

Table 5: Frequency and Percentage Distribution of Level of Acceptability among the Nurses Regarding Bottle drain and Molidrain Bag

Variable	Molidrain bag group (n = 30)		Bottle drain group (n = 30)	
	f	%	f	%
Highly Unacceptable (0 – 10)	0	0	9	30
Unacceptable (11 – 20)	0	0	21	70
Acceptable (21 – 30)	0	0	0	0
Highly Acceptable (31 – 40)	35	100.0	0	0

Table 6: Association between the Level of Nursing Competency of Nasogastric Aspiration and the Demographic Variables of Post Abdominal Surgery Patients in Molidrain Group and Bottle Drain Group

Demographic Variables	Molidrain Group (n=30)			Bottle drain group (n=30)		
	Up to Mean	Above Mean	χ^2 value	Up to Mean	Above Mean	χ^2 value
Age in years						
≤ 35	-	-	1.677 df=1	-	-	1.407 df=1
36 - 50	2	13		3	2	
≥ 50	5	10		8	7	
Gender						
Male	3	8	0.151 df=1	8	17	1.407 df=1
Female	4	15		3	2	
Smoking						
Yes	2	1	3.49 df=1	4	9	0.344 df=1
No	5	22		7	10	
Alcohol						
Yes	1	0	3.39 df=1	3	5	0.003 df=1
No	6	23		8	14	
Residence						
Urban	5	18	0.14 df=1	1	1	2.00 df=1
Semi urban	2	5		9	18	
Rural	0	0		1	0	
Family						
Single	0	2	0.652 df=1	0	0	NA
Nuclear	3	9		11	19	
Jiont	4	12		0	0	
Occupation						
Private	2	1	6.841 df=1	0	0	1.787 df=1
Government	3	4		10	19	

| Self employment | 1 | 13 | | 1 | 0 | |
| Unemployment | 1 | 5 | | 0 | 0 | |

Table 7: Association between the Level of Nursing Competency of Nasogastric Aspiration and the Clinical Variables of Post Abdominal Surgery Patients in Molidrain Group and Bottle Drain Group

Clinical variables	Molidrain group (n=30)			Bottle drain Group (n=30)		
	Up to Mean	Above Mean	χ^2	Up to Mean	Above Mean	χ^2
BMI (category)						
≤ 18.5	0	0	0.852 df=1	0	0	3.701 df=1.26
18.5 - 25	1	2		9	19	
25 - 30	1	1		2	0	
≥ 30	6	22		0	0	
Hypertension						
Yes	3	6	0.719 df=1	11	19	NA
No	4	17		0	0	
Diabetes Mellitus						
Yes	2	5	0.140 df=1	11	16	1.93 df=1
No	5	18		0	3	
COPD						
Yes	0	0	NA	1	0	1.287 df=1
No	30	100		10	19	
Renal Disorder						
Yes	0	0	NA	0	0	NA
No	14	16		12	18	
Cancer						
Yes	2	10	0.497 df=1	11	18	0.599 df=1
No	5	13		0	1	
Previous Surgery						
Yes	1	0	3.399 df=1	10	18	0.164 df=1
No	6	23		1	1	
Ambulation (in days)						
≤ 3	4	13	0.001 df=1	9	21	NA
≥ 3	3	10		-	-	
Elevation of head (in days)						
≤ 2	5	13	0.497 df=1	7	11	0.096 df=1

5. Discussion

The Major findings of the study were

1) Half of the post abdominal surgery patients in molidrain group and majority of the post abdominal surgery patients in bottle drain group were belonging to the age group of >50 years (50% and 83.3%) respectively. Majority of them in molidrain group were females (63.3%), while most of them in bottle drain were males (83.3%), more than half of them in molidrain group were from joint family (53.3%) but all of them in bottle drain group were belonging to nuclear family (100), most of them in molidrain group and more than half of them in bottle drain group were non smokers (90% and 56.7%), most of them in molidrain group and majority of them in bottle drain group were non alcoholics (96.7% and 73.3%) less than half of them in molidrain group were self employed (46.7%), while most of them were working in government sector in bottle drain group (96.7), majority of them in molidrain group were from urban area (76.7%) and most of them in bottle drain group were residing in semi urban area (90%) respectively.

2) Most of the post abdominal surgery patients had BMI of 18.5 – 25 in both molidrain group and bottle drain group (93.3%). Majority of patients in molidrain group had no history of hypertension (70%) and all of the post abdominal surgery patients in bottle drain group had co -

morbidity of hypertension (100%), most of the patients in the molidrain group had no history of diabêtes mellitus (76.3%) but, majority of the patients in bottle drain group had history of diabetes mellitus (90%), none of them had renal disorders in both the groups, most of them in moildrain group and majority of them in bottle drain group had cancer (96.7% and 60%) respectively. Majority of them were maintained with head end elevation of $\leq 30°$ (60%) in both the groups, and majority of them had history of previous surgery (96.7% and 93.3%) in both the groups. More than half of them in moildrain group and all of the post abdominal surgery patients in bottle drain group were ambulated within 3rd post operative day (56.7% and 100%) respectively

3) Most of the nurses demonstrated non competency with bottle drain for nasogastric aspiration (70%) among post abdominal surgery patients where as all the nurses demonstrated high competency with the molidrain bag for the nasogastric aspiration among post abdominal surgery patients (100%).

4) There was a statistically significant difference in nursing competency between the molidrain group (M=41.86, SD=4.33) and bottle drain group (M=10, SD=1.38) with t value of 37.05 at $P < 0.001$. There was a significant difference in scores regarding safe handling (t = 43.208), prevention of complocation (t = 33.970), prevention of infection (t = 31.100), time and cost control (t = 18.34) between molidrain bag group and bottle drain group,

which is significant at p<0.000 level. Thus the null hypothesis H01 stating that "There will be no significant difference in nursing competency of nasogastric aspiration among post abdominal surgery patients between the molidrain bag group and bottle drain group" was rejected.

5) All of them had high acceptability towards molidrain bag for nasogastric aspiration (100%) while majority of the nurses had unacceptability towards bottle drain (70%). Hence the null hypotheses stating that Ho4 "There will be no significant difference in level of acceptance of nurses regarding between molidrain bag and bottle drain for naso - gastric aspiration among post abdominal surgery patients" was rejected.

6) There was no significant association between the level of nursing competency of nasogastric aspiration and the demographic variables such as age, gender, habit of smoking, alcoholism, residential area, type of family, occupation of post abdominal surgery patients in molidrain group and bottle drain group. Hence the null hypothesis HO2 stating that "There will be no significant association between the level of nursing competency of nasogastric aspiration and the demographic variables of post abdominal surgery patients in molidrain group and bottle drain group" was retained.

7) There was no significant association between the level of nursing competency of nasogastric aspiration and the selected clinical variables such as body mass index, history of hypertension, diabetes mellitus, COPD, renal disorder, cancer, previous surgery, starting day of the ambulation and head end elevation of the post abdominal surgeries in molidrain bag group and bottle drain group. Hence the null hypothesis HO3 stating that "There will be no significant association between the level of nursing competency of nasogastric aspiration and the clinical variables of post abdominal surgery patients in molidrain group and bottle drain group" was retained.

6. Conclusion

The study findings revealed that the clinical skill is improved by the usage of molidrain bag, the bag facilitates accurate measurement and easy tubing connection, reduce time consumption, reduce spillage of content thus provide clean environment, easy observation of the drain content.

References

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