Original article

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Practice regarding Rotahaler Inhalation Technique among Patients of Selected Ward of Tertiary Care Hospital

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ABSTRACT

Background: A rotainhaler is a plastic inhalation device which is breath activated, which means while inhalation the rotainhaler releases medication from the rotacap. A rotainhaler has been developed over the last two decades for the treatment of asthma and chronic obstructive pulmonary disease (COPD). It is particularly useful in chronic obstructive pulmonary disease and asthma. The medication is commonly held either in a capsule for manual loading or a proprietary from inside the inhaler. There are various techniques of rotainhaler; once loaded or actuated, the operator put mouthpiece of inhaler into their mouth and takes a sharp, deep inhalation, holding their breath for 5-10 second. According to the Global Burden of Disease (GBD) study, COPD rose from the eighth to fifth leading cause of global burden of disease from 1990-2013. In 2013, COPD was the fourth leading cause of death globally, and it is predicted that COPD will become the third leading cause by 2020.

Methods: A descriptive cross-sectional study design was used to assess practice regarding rotainhaler technique among patients of selected ward of tertiary care hospital. Non-probability purposive sampling technique was used to select 42 sample for the study. A tructured questionnaire was used to assess socio-demographic characteristics and observational checklist was used to assess inhalation technique. Collected data were analyzed by using descriptive as well as inferential statistics.

Results: The main findings of the study showed that, majority of respondents (76.2%) had incorrect practice regarding rotainhaler technique. There was significant association between level of practice regarding rotainhaler technique with age, sex, place of residence and occupation of the respondents.

Conclusions: The findings concluded that majority of respondents had incorrect practice. For the improvement of practice regarding rotainhaler technique among patient, there is crucial part of patient education and counselling about the rotainhaler.

Keyword: *Practice, Patient, Tertiary care hospital.*

INTRODUCTION

A Rota inhaler has been developed over the last two decades for the treatment of asthma and chronic obstructive pulmonary disease (COPD).[1] Globally 10-20% of the population older than 40 years is suffering from chronic obstructive pulmonary disease and three million die each year.[2] The mainstay of COP, asthma, and asthma-COPD overlap syndrome (ACOS) treatment is inhalational medication(s).

The correct use of an inhaler device involves a series of steps, which need to be performed. Previous studies have reported that up to 94% of the patients used incorrect methods of inhalation of the medication.[3] Poor inhalation techniques are associated with decreased medication delivery and poor disease control in chronic lung diseases and unwanted side effects and also result in greater therapy expenses.

The proportion of patients correctly using inhalation devices is currently lacking in studies of Nepal. This study hence intended to assess the practice regarding rotainhaler technique among patient of selected ward of tertiary care hospital.

METHODS

A descriptive cross-sectional research design was adopted and the study was done at Nobel Medical College and Teaching Hospital (NMCTH), Biratnagar from 2079/08/06 to 2079/08/19. This study was conducted after acquiring approval from the Institutional Review Committee of the NMTCH. The purpose of the study was explained to the respondents and they were explained about the study. Following this, informed consent was obtained from each respondent.

A total of 42 respondents were taken as a sample by using a convenience sampling technique. The sample size was calculated using the formula $n = Z^2pq/d2$, sample size was calculated to be 42. Patients diagnosed with pulmonary disease, using Rota inhale devices for at least one months at the time of enrolment were chosen as sample. Data was collected using a Structured questionnaire was used to assess socio-demographic characteristics and an observational checklist was used to assess inhalation technique. [4.] research instrument had distinct 3 parts: Part I includes a socio-demographic profile containing information on age, sex, educational level, religion, marital status, place of residence, Occupation, duration of rotainhaler use co-morbid status, instruction about rotainhaler use, demonstration regarding rotainhaler use, re-demonstration regarding rota inhaler use. Part II consists of Yes / NO Questions for practice regarding the care of rotainhaler. Part III consists of an observational checklist which includes the steps given by Lung association and package leaflet (Cipla) that was used to assess practice regarding rotainhaler technique. [3] If the patient performs essential steps like holding mouthpiece firmly, seal the mouthpiece with teeth, deep inhalation, holding breath for as long as possible then they were coded as having correct technique and those who failed to perform all or at least one of these essential steps were designate of having incorrect inhalation technique. The scoring of checklists was classified as Correct technique= 1 and Incorrect technique=0.

Data were analyzed using SPSS (Statistical Package for Social Science) version 25. For descriptive statistics frequency, percentage, mean and standard deviation were calculated along with appropriate tabular presentation. For inferential statistics Chi-square test was used to find the association between the practice regarding rota inhaler technique with selected socio-demographic variables.

RESULTS

Table 1a: Socio-demographic characteristics of respondents

n =42

Characteristics	Frequency (N)	Percentages (%)
Age in years		
45-55	10	23.8
56-65	21	50.0
66-75	9	21.4
76-85	2	4.8
Sex		
Male	31	73.8
Female	11	26.2
Educational level		
Informal	10	23.8
Basic (1-8class)	21	50.0
Secondary (9-12class)	11	26.2
Religion		
Hindu	30	71.4
Buddhist	9	21.4
Islam	3	7.1

Table 1a shows the socio-demographic characteristics of the respondents in which, half of the respondents (50.0%) fall under the age group of 56-65 years. Out of those total respondents, the majority of the respondents (73.8%) were male.

Table 1b: Socio-demographic characteristics of respondents

n =42

Characteristics	Frequency (N)	Percentage (%)
Marital status		
Married	33	78.6
Unmarried	1	2.4
Widow / widower	8	19.0
Place of residence		
Rural	23	54.8
Urban	19	45.2
Occupation		
Unemployed	10	23.8
Business	13	31.0
Daily wages	3	7.1
Homemaker	11	26.2
Service (government/ private)	5	11.9
Duration of rota inhaler used		
1-5 years	27	64.3
6-10 years	15	35.7

Table 1b shows the socio-demographic characteristics of the respondents in which the majority (78.6%)

respondents were married. Nearly two third (64.3%) of respondents were using rota inhaler for 1-5 years.

Table 1c: Socio-demographic characteristics of respondents n =42

Characteristics	Frequency (N)	Percentage (%)
Co – morbid status		
Yes	13	31.0
No	29	69.0
Instruction about rotainhaler use		
Yes	40	95.2
No	2	4.8
Demonstration of rotainhaler technique		
Yes	6	14.3
No	34	81.0
Re-demonstration of rotainhaler technique		
Yes	2	4.8
No	38	90.5

Table 1c shows the socio-demographic variables in which majority of the respondents (69.0%) did not have any co-morbidities.Majority of the respondents (81.0%) had not got demonstration on rotainhaler technique. Regarding re-demonstration, most of the respondents (90.5%) had not done any re-demonstration on rotainhaler technique.

Table 2: Practice regarding care of rotainhaler after use **n =42**

Characteristics	Frequency (N)	Percentage (%)
Clean the rotainhaler after use		
Yes	38	90.5
No	4	9.5
Time to clean the rotainhaler		
Daily	28	66.7
After each use	3	7.1
No fixed Schedule	8	19.0
Twice a week	3	7.1
Method of cleaning the rotainhaler after use		
Clean with tap water	19	45.2
Clean with hot water	2	4.8
Wipe with the clothes	21	50.0
Rinse mouth after use		
Yes	41	97.6
No	1	2.4

Table 2 shows care of rotainhaler after use were most (90.5%) of the respondents clean the rotainhaler after use. similarly, two third of the respondents (66.7%) clean the rotainhaler daily. Similarly, half 50.0% of the respondents clean the rotainhaler with the clothes. Most (97.6%) of the respondents rinse there mouth after use of rotainhaler.

Table 3: Practice regarding rotainhaler technique **n =42**

Practice	Frequency (N)	Percentages (%)
Incorrect	32	76.2
Correct	10	23.8

Table 3 shows that, majority of the respondents (76.2%) had incorrect performance regarding Rota inhaler technique.

Table 4a: Association between level of practice regarding rotainhaler technique with selected variables **n =42**

Variables	Level of Practice		pvalue
	Correct No, (%)	Incorrect No. (%)	
Age in years			
<60	8 (80.0%)	2 (20.0)	0.000
≥60	2 (6.3%)	30 (93.8%) *	
Sex			
Male	10 (32.3%)	21 (67.7%)	0.041*
Female	0 (0.0%)	11 (100.0%)	
Educational level			
Can read and write	7 (33.3%)	14 (66.7%)	0.277
Cannot read and write	3 (14.3%)	18 (85.7%)	
Religion			
Hindu	6 (20.0%)	24 (80.0%)	0.433
Non- Hindu	3 (60.0%)	2 (40.0%)	

**p – value significant at p- value <0.05 (Fischer Exact test).*

Table 4a shows that there was statistically significant association between level of practice regarding rotainhaler technique among age, sex (male).

Table 4b: Association between level of practice regarding rotainhaler technique with selected variables **n =42**

Characteristics	Practice		P value
	Correct performance (N%)	Incorrect performance (N%)	
Marital Status			
Married	7 (21.2%)	26 (78.8%)	0.660
Others	3 (33.3%)	6 (66.7%)	
Place of residence			
Rural	2 (8.7%)	21 (91.3%)	0.026*
Urban	8 (42.1%)	11 (57.9%)	
Occupation			
Household activities	1 (4.8%)	20 (95.2%)	0.009*
Service/labor	9 (42.9%)	12 (57.1%)	
Duration of Rotainhaler used			
1-5 years	8 (29.6%)	19 (70.4%)	0.286
6-10 years	2 (13.3%)	13 (86.7%)	

**p-value significant at p-value <0.05 (Fischer Exact test).*

Table 4b shows that there was statistically significant association between level of practice regarding rotainhaler technique with place of residence (rural) and occupation (household activities) but there was no any significant association with marital status and duration of rotainhaler use.

Table 4c: Association between level of practice regarding rotainhaler technique with selected variables **n =42**

Characteristics	Practice		P value
	Correct performance (N%)	Incorrect performance (N%)	
Co-morbid status			
Yes	1 (7.7%)	12 (92.3%)	0.134
No	9 (31.0%)	20 (69.0%)	
Instruction about rotainhaler use			
Yes	10 (25.0%)	30 (75.0%)	0.1000
No	0 (0.0%)	2 (100.0%)	
Demonstration			
Yes	2 (33.3%)	4(66.7%)	0.577
No	8 (23.5%)	26 (76.5%)	
Re-demonstration			
Yes	1 (50.0%)	1 (50.0%)	0.424
No	9 (23.7%)	29 (76.3%)	

**p-value significant at p-value <0.05 (chi square test).*

Table 4c shows that there was no any significant association with co-morbid status, instruction, demonstration, re-demonstration of rotainhaler technique.

DISCUSSION

In this study, half (50.0%) of the respondents fall under age group from 56-65 years while only (4.8%) of the respondents fall under age group from 76-85 years. Similarly, majority (73.8%) of the respondents were male, half (50.0%) of the respondents had completed their basic educational level, majority (71.4%) of the respondents were from Hindu religion, while less than one fourth (21.4%) were from Buddhist religion. Regarding to marital status, majority (78.6.0%) of the respondents were married, only (2.4%) of the respondents were unmarried, while more than half (54.8%) of the respondents were from rural area and nearly half (45.2%) of the respondents were from urban area. Similarly, more than one fourth (31.0%) of the respondents were engaged in business, one fourth (26.2%) of respondents were homemaker. Similarly two third (64.3%) of the respondents were using rotainhaler since 1-5years, more than one fourth (35.7%) of the respondents were using rotainhaler since 6-10 years.

Two third (69.0%) of respondents had not any co-morbid status, while most (95.2%) of the respondents had got instruction about rotainhaler use, only (4.8%) had not got instruction about rotainhaler use. Similarly, only (14.3%) of respondents had demonstrate the procedure, most (81.0%)of respondents had not demonstrate the rotainhaler technique.Similarly, only(4.8%) of respondents had re-demonstrate the rotainhaler technique and most (90.5%) of the respondents had not re-demonstrate the rotainhaler technique.

The descriptive statistical analysis of the present study showed that out of 42 respondents, majority (76.2%) of the respondents had incorrect practice, while less than one fourth (23.8%) of the respondents had correct practice regarding rotainhaler.

The above findings were supported by the study conducted by Sapkota D, Amatya YR. Assessment of rotahaler inhalation among patients with chronic obstructive pulmonary disease in a teaching hospital of Nepal 2016. The findings were majority of respondents (63%) had incorrect rotahaler inhalation technique while 37% showed the correct technique.[6]

Similarly, this study was also supported by Shankar Dr.M, Kumar Dr. S , Shrivastava mohan . Dr.P. Dry powder Inhalation knowledge and practices among COPD

patients in Bihar. The findings were minority (4%) of the patients demonstrated the rotainhaler correctly, while most of them (96%) performed steps incorrectly.[7]

The above findings was in contrast with the study conducted by Baral MA. Knowledge and practice of dry powder inhalation among patients with chronic obstructive pulmonary disease in a regional hospital, Nepal in 2016 among 204 participants. The findings revealed that (77.5%) performed the steps correctly and (22.5%) performed incorrectly.[8]

The present study showed that level of practice regarding rotainhaler technique was significantly associated with age, sex, occupation , place of residence where as educational level , religion ,marital status , co-morbid status , instruction , demonstration and re-demonstration were not significantly associated at <0.05 level of significance.

The above findings was supported by the study conducted by Sapkota D, Amatya YR. Assessment of rotahaler inhalation among patients with chronic obstructive pulmonary disease in a teaching hospital of Nepal 2017 which showed association of level of practice with respondents occupation, age , re-demonstration of inhalation technique at level of signifance.[6] The study findings is also in the line with the finding of study conducted in Nepal which showed that there is significant association between the level of practice with age and place of residence.[6]

The above finding was in contrast with the study conducted by Sapkota D, Amatya YR. Assessment of rotahaler inhalation among patients with chronic obstructive pulmonary disease in a teaching hospital of Nepal in 2017 which showed level of practice with respondents sex, educational status, duration of use, demonstration was not significantly associated .[6] The above finding was in contrast with the study conducted by Baral M which showed that level of practice with respondents educational status was not significantly associated.[8]

CONCLUSIONS

Based on the findings of the study, it concluded that the majority of the patients have incorrect rotahaler practices. age, sex, place of residence, occupation tend to influence the rotahaler practice of the patients. The study highlights the importance of improving the practice of the rotainhaler technique which will eventually improve medication delivery and efficacy and proper disease control. There is a need for demonstration and educating of patients about the correct use of the rota inhaler. Based on the present research study findings, the future researcher can conduct similar study can be conducted in different settings and can also be undertaken on a larger sample to find out the practice regarding the rotainhaler technique among patients.

Conflict of interest : None

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