Original Article

Awareness Regarding Lithium Toxicity among the Caregivers of Mentally III Patients Attending a Tertiary Level Mental Hospital, Bagmati Province

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ABSTRACT

Background: Lithium is the commonly used drug for bipolar affective disorders. Patient and family education about adverse effects, drug therapy and serum lithium monitoring are essentials to prevent and manage the lithium toxicity. Therefore, this study was conducted with the aim of finding out the awareness regarding lithium toxicity among the caregivers of patients receiving lithium.

Method: A descriptive cross-sectional was adopted in this study. A total of 141 caregivers were selected purposively from the psychiatric outpatient department of Mental Hospital Lagankhel, Lalitpur over a period of four weeks from September 1st to 28th, 2019. Caregivers were interviewed using structured interview schedule. Data were analyzed by SPSS version 16. Descriptive and inferential statistics (chi-square test) were used to describe the socio-demographic variables and measure the association between level of awareness and selected socio-demographical variables.

Results: The study findings revealed more than (52.5%) half of the family members were not aware of the fact that lithium may cause toxicity if taken inappropriately. There was no statistically significant association between the level of awareness and respondents' socio-demographic variables.

Conclusion: More than half of the caregivers are unaware regarding lithium toxicity. Thus indicates a need to provide information and education regarding lithium toxicity to the caregivers of patients taking lithium.

Keywords: Awareness, Caregivers, Knowledge, Lithium Toxicity

INTRODUCTION

A mental disorder is a major disturbance in an individual's thinking, feelings, or behavior that reflects a problem in mental function. Mental disorders cause distress or disability in social work, or family activities.[1] Globally, an estimated 60 million people are suffering from bipolar disorder[2].It has been estimated the prevalence of bipolar disorder is between one to two percent and associated with a wide range of adverse mental and physical health outcomes. It is sixth leading cause of medical disability worldwide.[3, 4]

Lithium is a commonly prescribed medication for bipolar disorder. Lithium has been observed to have a unique therapeutic profile, including mood-stabilizing effects, as well as anti-suicidal and neuro-protective properties.[5] Lithium is used to treat a variety of psychiatric disorders and has demonstrated efficacy in the maintenance phase of bipolar disorder but this drug has a narrow therapeutic index and, if not monitored regularly, can result in toxicity.[6] Lithium toxicity is a potentially serious condition caused by having too much lithium in blood.[7]

Families are a primary care giving resource for people with mental illness. Studies show that families required basic information on facts about mental

illness and its treatment, behavior management skills, and the mental health system in order to better cope with their relatives' illness.[8]The treatment is usually more effective when caregivers are equipped with the proper knowledge.[9] In United States, 54% of care givers of mentally ill patients felt difficulty to find the right drug and dose.[10] In Sao Paulo, Brazil, 52.8% patients had little knowledge in relation to the dosage of medicine.[11] In India, it has been found that knowledge about lithium therapy was below average among the caregivers.[12]Similarly, according to another study in India, only seven percentages of caregivers had good knowledge.[13] Patients on lithium therapy may experience adverse effects of lithium that can be mild to severe in range which may require prompt management. Thus, psycho education to both patients and the caretakers is equally important to prevent and mange complication related to lithium therapy.[14, 13]

Studies show that knowledge about lithium in care givers tends to influence knowledge of their patients. So, it is important to provide information about the illness and lithium therapy which can influence the course of disease and reduce the risk of toxicity.[12]

Hence, with the aim of the finding out the awareness regarding lithium toxicity among the caregiver of mental ill patient, this study was carried out.

METHOD

A descriptive cross sectional research design was used in this study. The study was conducted in a tertiary level governmental mental hospital Lagankhel, Lalitpur district of Nepal among the caregivers of patients taking lithium. Caregivers living with and providing the care to patient at least for one month were included as study sample. A total of 141 caregivers who agreed to take part in the study were selected using on probability purposive sampling technique.

Structured questionnaire was developed by researchers based on research objectives that consisted of two parts. Part I was related to socio demographic variables and disease related characteristics consisting of 22 items, whereas part II was related to awareness on lithium toxicity consisting 16 items questions. Back translation was done in Nepali language. Content validity was established through extensive literature review and consultation with subject experts. Data was collected after getting ethical approval from the Institutional Review Committee of TU and administrative authority of Mental Hospital Lagankhel. Informed written consent was obtained from each respondent. Confidentialitywas maintained by not disclosing the information as well as the obtained data was used only for the research purpose. Data was collected via in-person interview using structured questionnaire. Data collection was done during September 2019. Data was analyzed with descriptive and inferential statistics.

RESULT

Age range of the respondent were 19-59 where 36.2% were from the age more than and equals to51 years, and 58.9% of the respondents were male and 41.1% of them were female. Nearly half of respondents (48.2%) were Brahmin\Chhetri followed by Janajati 33.3%. More than half (58.9%) of the respondents were from nuclear family. Likewise, 35.5% of the respondents were spouses of the patient. In terms of educational status, Majority (80.1%) of the respondents were literate, among them 26.3% had achieved education of bachelor level. Regarding occupation, one third (30.5%) of the respondents were farmers. They had their family income sufficient for one year and surplus.

Table 1: Socio–demographic Characteristics of Respondents **(n=141)**

Characteristics	Number	Percentage
Age group in completed year		
≤30	22	15.6
31 – 40	31	22.0
41 – 50	37	26.2
≥51	51	36.2
Mean Age ±SD =45.4±13.1		
Sex		
Male	83	58.9
Female	58	41.1
Ethnicity		
Brahmin\Chhetri	68	48.2
Janjatis	47	33.3
Dalit	22	15.6
Madhesi	4	2.8
Marital Status		
Married	131	92.9
Unmarried	10	7.1
Relationship with patient		
Spouse	50	35.5
Parent	49	34.8
Son	25	17.7
Daughter	10	7.0
Other (sibling, daughter)	7	5.0
Types of family		
Nuclear	83	58.9
Joint	58	41.1
Education		
Can read and write	113	80.1
Cannot read and write	28	19. 9
Level of Education (n=113)		
Informal Education	26	23.0
Primary	15	13.3
Secondary Level	16	14.2
Higher secondary level	26	23.0
Bachelor level	30	26.5

Table 2: Respondents' Awareness regarding Periodic Blood Testing during Lithium Therapy (n=141)

Variables	Number	Percentage
Need of Periodic Blood Testing		
Yes #	110	78.0
No	7	5.0
Do not know	24	17.0
Time Interval for Blood test (n= 110)		
Every 3 months	5	4.5
Every 6 months#	18	16.4
Every 6 months to 1 year	6	5.5
As per suggestion	36	32.7
Do not know	45	40.9
Reasons for Regular Blood Test (n=110) *		
To measure the amount of serum lithium level in blood	38	34.5
To check thyroid hormone level	25	22.7
To check sugar	14	12.7
To check kidney function	5	4.5
Don't know	38	34.5
Time interval between the last dose of lithium intake and blood investigation for lithium level (n=38)		
12 hours after last dose#	15	39.5
Other Test require while taking lithium*		
Electro cardio graph (ECG)	20	18.2
Thyroid test	14	12.7
Urine test	3	2.1
Do not know	113	80.1

*Multiple Responses #Correct Response

Table 2 indicates that 78% of the respondents were aware of the need for periodic blood tests. Likewise, 16.5% respondents said their patient required a blood test every 6 months and more than one third (34.5%) of respondents were aware to measure serum lithium level. Among them 39.5% of respondents were aware that serum lithium level should be done 12 hours after the last dose of lithium. Likewise, 18.2% respondents were aware about monitoring of ECG while being on lithium therapy.

Table 3: Respondents' Awareness Regarding Effects of Lithium (n= 141)

Variables	Number	Percentage
Therapeutic Effect of lithium*		
Reduce aggression	98	69.5
Stabilization of mood	62	44.0
Reduce impulses	9	6.4
Prevent relapse	46	32.6
Side effects of lithium*		
Diarrhea	3	2.1
Increased thirst	22	15.6

Weight gain	17	12.1
Hand tremor	13	9.2
Constipation	3	2.1
Others**	4	6.4
Do not know	79	56.0
Potentiality of Toxic effects of lithium	2	1.4

**Multiple Responses, ** Others, Acne-2, Excessive sweating-2, Frequent urination-1*

Regarding the effect of lithium, 69.5% of the respondents answered lithium reduces aggression concerning the side effects, 15.6% of respondents answered increased thirst likewise 12.1% of respondents said weight gain. Almost all (98.66%) of respondents were unaware about potentiality to toxic effect of lithium.

Table 4: Respondent's Awareness Regarding Prevention of Lithium Toxicity (n=141)

Variables	Number	Percentage
Missed dose management		
Take missed dose as soon as remembering it	25	17.7
Leave the missed dose, if it's time for the next dose, #	102	72.3
Take the missed dose and regular dose at once	6	5.7
Don't know	8	4.3
Can take other medication without doctor advice		
Yes	74	52.5
No #	67	47.5
Reason for not taking other medication (n=67) *		
To maintain serum lithium level	1	1.5
To prevent drug interactions	62	93.0
Do not know	5	7.5
Precaution to be taken in home*		
Take medicine as directed by Physician	135	95.7
Fluid intake 2-3 liter	130	92.2
Do not use any medicine without prescription	124	87.9
Do not engage in activity that require attention	2	1.4
Home Management of diarrhea related to Lithium Intake *		
Continue lithium	76	53.9
Take advice from the doctor	59	41.8
Increase the fluid intake and continue the dose of lithium	134	95.0

More than two third (72.3%) of respondents were aware about management of missed dose of lithium and near about half (47.5%) of respondents answered not to give any medicine without doctor advice. Concerning the reason for not taking other medication, most (91%) of the respondents were aware of preventing drug interaction. Almost all (95.7%) the respondents answered take medicine as directed by physician and equal percentage (95%) of respondents answered about increase the liquid intake and continue the dose of lithium for the management of diarrhea.

Table 5: Respondents' Awareness regarding Lithium Toxicity

Level of Awareness	Number	Percentage
Unaware (<50 %)	74	52.5
Aware (≥50 %)	67	47.5
Total	**141**	**100**

Table 5 shows that less than half 47.5% of respondents were aware regarding lithium toxicity.

Table 6: Association between Awareness and Socio-demographic Characteristics of Respondents (n=141)

Variables		Awareness		χ^2	p – Value
		Unaware (No.) %	Aware (No.) %		
Age of Respondent	<50	40 (28.4)	41(29.0)	0.733	0.392
	≥50	34 (24.1)	26 (18.4)		
Sex	Male	42 (29.8	41 (29.0)	0.286	0.593
	Female	32 (22.7)	26 (18.4)		
Religion	Hindu	59 (41.8)	58 (41.1)	1.164	0.281
	Others	15 (10.6)	9 (6.4)		
Ethnicity	Brahmin/ Chhetri	37 (26.2)	31 (22.0)	0.196	0.658
	Others	37 (26.2)	36 (25.5)		
Marital Status	Married	68 (48.2)	63 (44.7)	0.244	0.621
	Unmarried	6 (4.3)	4 (2.8)		
Type of Family	Single	44 (31.2)	39 (27.6)	0.023	0.880
	Joint	30 (21.3)	28 (19.9)		
Education	Literate	60 (42.5)	53 (37.6)	0.086	0.769
	Illiterate	14 (9.9)	14 (9.9)		
Occupation	Agriculture	11 (7.8)	4 (2.8)	2.926	0.087
	Non Agriculture	63 (44.7)	63 (44.7)		

Level of significance at <0.05

This study shows that there was no significant association between the level of awareness and selected variables like age, sex, religion, ethnicity, marital status, education and occupation of respondents.

DISCUSSION

Among 141 respondents surveyed, the mean age was 45.14 years and more than half (58.9%) were female. Regarding the relationship with patients more than one-third (35.5%) were the spouses and nearly same proportion (34.8%) were taking care as parents. The finding from current study reveals that majority (78%) of respondents were aware of the need for periodic blood testing. This finding is in contrast to the study conducted in India that showed 50% of the respondents were aware about regular blood testing.[12]However,onlyone-third (34.5%) of respondents were aware of the reason for regular blood testing. This finding is consistent with the finding of study conducted at Coimbatore India in which slightly greater proportion of respondents (48.7%) were aware of the reason of periodic blood testing.[12] Current study result shows that, 39.5% of respondents were aware about the fact that serum lithium level should be tested 12 hours after intake of

last dose of lithium and this finding is similar to the study done in Turkey.[13]Another study done in India has finding inconsistent to the finding of current study where 53.8% of caregivers had answered correctly.[12]

The study shows that the respondents' knowledge regarding action of lithium is low, as less than half (44.0%) of the respondents could correctly answered that lithium acts as mood stabilizer. This finding is similar to the study conducted in Coimbatore, India showed that 35.9% caregivers identified lithium as a mood stabilizer. This might be because the patient and family teaching was not focused in that topic. Regarding awareness about side effects of Lithium, more than half (56%) of the respondents were not aware about any of common side effects, only 15.6%, 12.1% and 9.2% could mention the side effects increased thirst, weight gain and hand tremor respectively. This finding is contrast to study done in India where 34% of caregiver were aware about side effect of lithium. The study reflects that family members of patients receiving lithium are prone to overlook the initial symptoms of toxicity and adverse effects. The current study reveals that almost all (98.6%) respondents were unaware of toxic effects of lithium. This finding has been contradicted with study conducted in Coimbatore, India where nearly 50 % of the respondents were aware about the warning signs of lithium toxicity.[13]

In contrast to the awareness on toxicity, the respondents were found a bit aware about the possibility of drug interaction while being on lithium therapy. The study finding revealed that nearly half (47.5%) of respondents were aware that other drugs should be avoided while taking lithium. This finding is consistent with the study done in Coimbatore, India where 50% of caregivers were aware about it.[13] Concerning reasons for not taking other medication, almost all (91%) of the respondents were aware of preventing drug interaction.

The finding shows that family members are aware about the need of continuing the medicine according to prescription from physician and as 95.7% of respondents agreed on this fact. Similarly, 92.2% of respondents answered that the patients need to take 2-3 lt. of water per day. Regarding the precaution to be taken during episode of diarrhea while taking lithium, most of the respondents (> 90%) were aware of need of increasing liquid during suffering from diarrhea. This finding has been contradicted with study done in Coimbatore, India where 56.4% of caregivers were aware of this fact.

The study result reveals that 52.5% of the respondents were not aware of lithium toxicity. This finding is also contradicted with another study done in India, which showed that 55% had average knowledge, 38% had poor knowledge and only 7% had good knowledge regarding lithium toxicity.[13]

The current study found no statistically significant association with awareness and selected variables. However, the study done in India showed that there was statistically significant association between the level of knowledge and education (p=0.02), sex (p=0.007), and socioeconomic status (p=0.007).[13]

CONCLUSIONS

The study has concluded that care givers of patients taking lithium are not aware of lithium toxicity. The awareness of caregivers is not associated with their socio-demographic characteristics.

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Conflict of Interest: None

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