Adherence to Drug Treatment after Stroke and its Association with Patients' Beliefs about Medicines among Stroke Survivors

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Abstract

Aim: Medications for secondary prevention of stroke are important in reducing stroke recurrence in patients who have already experienced a stroke or transient ischemic attack. The objectives of this study were to assess adherence to drug treatment after stroke and to examine association between drug adherence and patients' beliefs about medicine and illness perception among stroke survivors.

Materials and Methods: A descriptive cross-sectional survey was conducted among 105 stroke survivors recruited consecutively from the stroke clinic. Medication adherence was assessed using Hill Bone Medication Adherence Scale. Beliefs about medicine and illness perception were assessed using Beliefs about Medicine Questionnaire (BMQ) and Brief Illness Perception Questionnaire (IPQ).

Results: The mean age of the participants was 65 ± 9.89 years. Majority of the participants (67.6%) were males and 24% had recurrent stroke. Assessment of medication adherence shows that 63.8% of stroke survivors had good adherence to medication and 36.2% had poor adherence. Participants who had more positive beliefs about drugs had good medication adherence compared to those with poor adherence (76.5% vs. 51.9%, $P = 0.008$) and this was statistically significant. Participants with a positive perception of illness had good medication adherence compared to those with negative perception (70.4% vs. 56.9%, $P = 0.19$), though it was not statistically significant.

Conclusion: Knowledge about the importance of drugs can increase patients' beliefs about medicines, and can improve medication adherence among stroke survivors.

Keywords: Beliefs about medicines, Illness perception, medication adherence, stroke survivors

INTRODUCTION

The burden of stroke is immense and recurrence of stroke is a major risk factor for increasing the burden of stroke. Medications play an important role in preventing stroke recurrence. The drug treatment for secondary prevention of stroke includes anti-platelets, high dose statins, and drugs to control vascular risk factors such as hypertension, diabetes, and dyslipidemia.[1]

Adherence to the medical regimen is defined as the extent to which a person acts in accordance with the prescribed interval and dose of the medication regime. Adherence to drug treatment in patients who have suffered from stroke is not optimal. In a study, factors identified as significant for drug compliance among stroke survivors after ischemic stroke were mental state of the patient, perception of medication necessity and doctor-patient communication and men were less compliant with drugs and had more concern about medications when compared to women.[2] Patient-level barriers identified were their ability to self-care, the importance people attach to a stroke event, and their knowledge of stroke and medication and medication level barriers identified were beliefs about medication and how it works, medication routines, changing medications, and regimen complexity and burden of

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treatment.[3] Studies also show that individual based post-discharge stroke nurse counseling and use of information package has shown an increased drug adherence of 87–100% at 6 weeks and 6 months following discharge among ischemic stroke patients.[4]

Studies on adherence to secondary prevention drugs and its associated factors among post-stroke patients are limited in India. Health-care professionals play an important role in medication adherence among stroke survivors. They should address the barriers and facilitate medication adherence behaviors. Multi-disciplinary discharge planning is needed to address these barriers which include shaping their beliefs and encouraging to take the medications.

Objectives of the study
The objectives are as follows:
* Assess adherence to drug treatment after stroke among stroke survivors.
* Determine the association of adherence to drug treatment with patient's beliefs about medicines and illness perception.

MATERIALS AND METHODS

A descriptive cross-sectional survey was conducted among 105 stroke survivors attending the stroke clinic of the selected setting .All post-stroke patients who met the inclusion criteria were selected consecutively from the stroke clinic.

Sample size
Sample size was estimated using Open epi version 3, open source calculator. Assuming a prevalence of 44% medication adherence among post-stroke patients, (according to an unpublished study conducted in the same department) with a 95% confidence interval ranging from 34% to 54% ($d = 10\%$), the estimated sample size was 95. A total of 105 study participants were recruited consecutively during the time period of November 2019–March 2020.

Inclusion criteria
The following criteria were included in the study:

* Patients with ischemic stroke 3 months after stroke up to 2 years.
* Age >18 years.

Exclusion criteria
The following criteria were excluded from the study:
* Those who have aphasia.

Data collection process
List of patients who met the inclusion criteria was taken from the stroke clinic conducted on every Friday in a week. After explaining the need and purpose of the study, informed consent was obtained from the study participants. Data collection tool consisted of four parts. Part I is the demographic data. Part II-IV contains standardized questionnaires to assess medication adherence and patients' beliefs about medicines

and illness perception. The technique used for data collection was interview method.

Description of tools
Hill-bone medication adherence scale (HB-MAS)
The Hill-Bone Medication Adherence Scale is a self-assessment tool for medication adherence, which has nine items. All possible scores range from 9 to 36, higher scores signify better adherence.[5]

Beliefs about medicines questionnaire (BMQ)
It is a self-administered questionnaire, consisting of 18 questions. It measures the beliefs about medicines in the patients. Score range from 18 to 90, with higher scores indicating good beliefs about medicines.[6]

Brief illness perception questionnaire (brief IPQ)
It consists of nine questions which measure illness perception in patients on a 0–10 response scale. Higher score indicates negative perception.[7]

Data analysis
The data collected were entered into Microsoft Excel. Frequency and percentage distribution were used to describe socio-demographic and clinical variables. Medication adherence of participants was categorized into good adherence and poor adherence based on the mean value of medication adherence score. Beliefs about medicines were categorized into positive beliefs and negative beliefs and Illness perception was categorized into positive and negative based on the mean score. To determine the association of drug adherence with selected variables, Chi-square test was used.

RESULTS

Section I: Demographic and clinical profile of the study
Of the participants, the mean age was 64 ± 9.89 years, 68% were males, 66% had up to high school as their level of education, 57.1% were unemployed and majority (97%) were married. Of them, 76% had first ever stroke. The number of drugs prescribed after stroke ranges from 2 to 9. Classification was done based on median value of 4. The presence of risk-factors among stroke survivors show that 67% were diabetic, 86% were hypertensive and 72% were dyslipidemic, 25% had CAD, and 4% had RHD. Among males, 52% were current or ex-smokers and 41% were alcoholic [Table 1].

Section II: Adherence to medication after stroke
The participants were classified into good adherent and poor adherent to drugs based on their mean value (34 ± 0.33). The score of the medication adherence ranged from 29 to 36. Among the stroke survivors, 63.8% had good adherent to medication and 36.2% were poorly adherent [Figure 1].

Section III: Association between medicine adherence and beliefs about medicines and illness perception
Table 2 describes the association between medication adherence and beliefs about medicine and illness perception**.** ($P < 0.05$

Table 1: Demographic profile of study participants (*n*=105)

Variables	*n* (%)
Mean age of participants: 65±9.89 years	
Gender	
Male	71 (68)
Female	34 (32)
Education status	
Upto10th	69 (66)
Above 10th	36 (34)
Occupational status	
Unemployed	60 (57.1)
Business	9 (8.6)
Professional	15 (14.3)
Unskilled	21 (20)
Marital status	
Married	102 (97)
Unmarried/widow/separated	3 (3)
Clinical variables	
First-ever stroke	80 (76)
Recurrent stroke	25 (24)
No of drugs	
≤4	53 (50.5)
>4	52 (49.5)
Risk factors	
Diabetic	70 (67)
Hypertensive	90 (86)
Dyslipidemic	76 (72)
Coronary artery disease	26 (25)
Rheumatic heart disease	4 (3.8)
Risk factors in males* (*n*=71)	
Current/Ex-smoker	37 (52)
Alcoholism	21 (41)

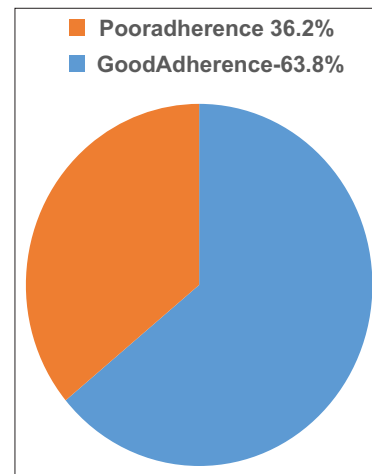*These risk factors were present only in males

Table 2: Association between medicine adherence and beliefs about medicines and Illness perception (n=105)

Variables	Categories	Medicine adherence (%)		*P* value
		Good (>34)	Poor (<=34)	
Belief about medicines	Negative beliefs (≤63)	28 (51.9)	26 (48.1)	0.008
	Positive beliefs (>63)	39 (76.5)	12 (23.5)	
Brief illness perception	Positive (≤47)	38 (70.4)	16 (29.6)	0.19
	Negative (>47)	29 (56.9)	22 (43.1)	

Figure 1: Adherence to medication after stroke among stroke survivors (*n* = 105)

compared to males (38.2% vs. 35%), those with up to high school level of education (68.1% vs. 55.6%), those with first ever stroke compared to recurrent stroke (66.2% vs. 56%), those with ≤4 drugs (66 vs. 61.5%) and those with diabetes mellitus (40% vs. 28.6%) had good adherence to medication. However, none of the variables showed a statistically significant association with medication adherence (*P* < 0.05 was considered as statistically significant).

DISCUSSION

This study was conducted among 105 stroke survivors to assess adherence to drug treatment after stroke and determine the association of drug adherence with patients' beliefs about medicines and illness perception. The mean age of participants was 64 ± 9.89 years and 68% were males. Among the stroke survivors, 63.8% had good adherence to medications and 36.2% had poor adherence. Participants with more positive beliefs about medicines had good adherence to drugs compared to those with negative beliefs and those with positive illness perception had good adherence than those with negative illness perception.

The findings in our study are supported by a similar study among 140 ischemic stroke patients, where the mean age of participants was 64.2 ± 9 and 66.6% were males. The drug adherence rate showed that 68.6% had optimal drug compliance. Furthermore, females had good adherence to medications compared to men similar to study finding in our study.[2]

In a study conducted in New Zealand, the adherence rate of medications prescribed at the time of discharge among stroke survivors at 6 weeks and 6 months was 87–100% which was reasonably high, compared to the adherence rate in this study.[4]

Another study conducted in China to investigate beliefs about medicines and their association with medication adherence in patients with chronic diseases found that 51% of patients in the stroke group were non-adherent to medications, which

was considered as statistically significant) Participants who had more positive beliefs about medicines had good adherence to drugs compared to those who had negative beliefs (76.5% vs. 51.9%, *P* = 0.008) and this difference was statistically significant. Participants with a positive perception of their illness had good medication adherence compared to those with a negative perception of their illness (70.4% vs. 56.9%, *P* = 0.19), though it was not statistically significant.

Section IV: Association between medicine adherence and selected socio- demographic and clinical variables

Table 3 describes the association between medicine adherence and selected socio-demographic and clinical variables. Those participants with age ≤ 65 years (40% vs. 26.7%), females

Table 3: Association between medicine adherence and selected socio- demographic and clinical variables (n=105)

Variables	Categories	Medicine adherence (%)		*P* value
		Good (>34)	Poor (≤34)	
Age	65 and below 65	30 (40)	45 (60)	0.19
	Above 65	8 (26.7)	22 (73.3)	
Gender	Male	25 (35)	46 (65)	0.76
	Female	13 (38.2)	21 (61.8)	
Education	Up to 10th	47 (68.1)	22 (31.8)	0.20
	Above 10th	20 (55.6)	16 (44.4)	
Occupation	Employed	30 (66.7)	15 (33.3)	0.59
	Unemployed	37 (61.7)	23 (38.3)	
Type of stroke	First ever stroke	53 (66.2)	27 (33.8)	0.35
	Recurrent	14 (56)	11 (44)	
Number of drugs	4 and below 4	35 (66)	18 (34)	0.63
	Above 4	32 (61.5)	20 (38.4)	
Risk factors	Diabetic	28 (40)	42 (60)	0.25
	Non-diabetic	10 (28.6)	25 (71.4)	
	Hypertensive	32 (36)	58 (64)	0.74
	Non hypertensive	6 (40)	9 (60)	
	Dyslipidemia	25 (32.9)	51 (67.1)	0.25
	Non dyslipidemia	13 (44.8)	16 (55.2)	

shows a higher rate of non-adherence compared to the finding in this study. In all patient groups with chronic diseases, non-adherence was associated with patients who had higher concerns about their medicines and those who were personally sensitive to the effects of medications.[8]

In this study, participants who had more positive beliefs about drugs had good medication adherence compared to those with poor adherence. The finding is consistent with the study conducted among Swedish stroke survivors where positive beliefs were less common and negative beliefs were more common among non-adherent stroke survivors.[9]

The limitations of this study were it was confined to the stroke unit of a single hospital and confined to stroke survivors who can read and understand the regional language Malayalam. However, the vast majority of patients who seek treatment in this stroke unit belong to the state of Kerala. The study assessed the overall medication adherence and did not assessed adherence rate to drugs specifically such as antithrombotic, antihypertensive, lipid lowering drugs, and anti-diabetic drugs. Despite this limitation, we could ensure good quality data, in spite of the limited time for data collection.

CONCLUSION

Providing proper information and education about drugs by health-care professionals enhance the knowledge of medications among patients, which can increase patients' beliefs about medicines and positive perception of their illness, thus improving medication adherence among stroke survivors.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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