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A CROSS SECTIONAL ANALYTICAL STUDY ON ADHERENCE AND PERSISTENCE OF CONTINUING SECONDARY PREVENTIVE MEDICINES FOR STROKE AT THE END OF 3 MONTHS IN A TERTIARY CARE CENTRE IN SOUTH INDIA

Neurology

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ABSTRACT

Prevalence of stroke in India is 90-222/100000 population. It causes so much morbidity to patient and family. Several classes of drugs are effective in preventing stroke recurrence by modifying the risk factors. There is limited data on long-term use of secondary prevention medications following stroke. Persistence is defined as the continuation of all medications patient was last prescribed at the end of 3 months. Adherence is defined as taking modified medications as per needs as per doctor's advice. **Methodology:** All patients with stroke both ischaemic and haemorrhagic and age more than 18 years , sustained in the one year when study is conducted as from the records of neurology department and attending the department for follow up are taken for study. A semi structured interview is done with them or their care givers to get information on their background characteristics, aetiology of stroke, comorbidities, cost of medication and affordability, various classes of medications administered and whether they are persistent in taking drugs, are they adherent to drugs, if not adherent/persistent ,reason for the same by open ended questions. **Result:** A total of 260 patients were included, mean age was 58.5 years. 78.5% had 3-month persistence and 3 month adherence 35.6%. Independent predictors of 3 month medication persistence included age more than 60 years, marital status, fewer medications prescribed at discharge and patients taking anti hypertensives . Most common reason for non-persistence was because the patients did not know why medication is being taken by them. **Conclusion:** Various factors play a role in persistence and adherence of medications in stroke. A multifactorial intervention including patient and health care providers are warranted, because of morbidity and mortality associated with every episode of stroke.

KEYWORDS

BACKGROUND

Prevalence of stroke in India is 90-222/100000 population. (1)Long term medications (usually lifelong) are needed by survivors of stroke and TIA as part of secondary prevention of stroke as well as for optimum control of co-morbidities. Adherence to medication decreases stroke recurrence by up to 80%. However long-term intake of medications decreases over time, leading to stroke recurrence, disability and death. Persistence is defined as the continuation of all medication's patient was last prescribed at the end of 3 months. Adherence is defined as taking modified medications as per needs as per doctor's advice. Inadequate care transitions, side effects, poor patient–provider communication, suboptimal patient re-sources, and medication affordability, as well as inadequate provider knowledge of drug costs are some of the reasons that have been sited for discontinuation of drugs.(4) More studies are required about medication adherence as a better understanding of the barriers and enablers of medication adherence could lead to the design of effective and feasible interventions, which will have positive effects on health.

Our aim was to study the adherence and persistence of continuing secondary preventive drugs 3months after stroke and to study the factors contributing to poor adherence and persistence in survivors of stroke.

METHODS

All patients with stroke, both ischaemic and haemorrhagic, sustained between Aug 2021 and July 2022 as obtained from the records of neurology department and attending the outpatient department for follow up are taken for study. The drug collection and intake details are obtained from the treatment books patients carry with them. A semi structured interview is done with them or their care givers to get information to get information on their background characteristics, aetiology of stroke, comorbidities, cost of medication and affordability, various classes of medications administered and whether they are persistent in taking drugs, are they adherent to drugs, if not adherent/persistent ,reason for the same by open ended questions. The results are analysed with respect to various parameters as discussed below. persistence was defined as continuation of all secondary preventive medications prescribed at hospital discharge, and adherence as continuation of prescribed medications except those stopped according to health care provider instructions. Patients were considered nonpersistent if they discontinued a medication regardless of the reason, and nonadherent if they discontinued a medication for reasons other than provider recommendation.

Standard protocol approvals, registrations, and patient consents, institutional ethics committee approval were obtained and written informed consent was obtained from all patients participating in the study.

Statistical Analysis

Documentation of being on a medication or class of medication is needed to be eligible for determination of persistence and adherence. Persistence was determined for background characteristics, comorbidities, no of medications at discharge and various classes of medication advised. Categorical and quantitative variables were expressed as frequency (percentage)and mean ± SD respectively. Chi-square test was used to find association between categorical variables. For all statistical interpretations, $p<0.05$ was considered the threshold for statistical significance. Statistical analyses were performed by using a statistical software package SPSS, version 20.0

RESULTS

A total of 260 patients were followed up. The mean age of patients was 58.5 years with a total of 172 males and 88 females. Most of them were educated up to middle school (56.9%),84.6% were married.

55.4% were hypertensive,38.5% were diabetic and 26.2% had dyslipidemia.61.5% were smokers and 64.6% were alcoholics. 81.5% had ischemic stroke and haemorrhagic in rest.53.8% people had more than 7 medications at discharge. Medication by class at discharge is given in tables.

Fig. Percentage distribution of the sample according to background characteristics.

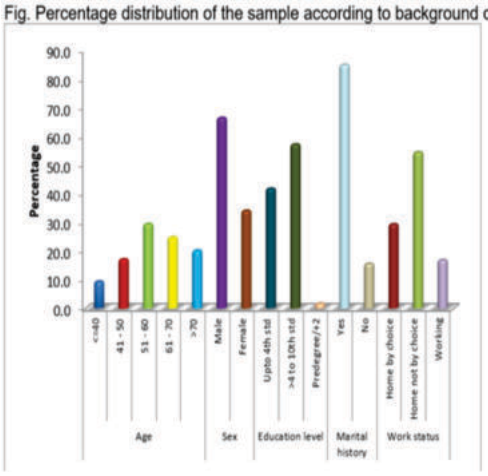

Table Percentage distribution of the sample according co morbidities

		Count	Percent
HTN	No	114	44.6
	Yes	144	55.4
DM	No	160	61.5
	Yes	100	38.5
DLP	No	192	73.8
	Yes	68	26.2

Table Percentage distribution of the sample according to addictions

		Count	Percent
Smoking	No	100	38.5
	Yes	160	61.5
Alcoholism	No	92	35.4
	Yes	168	64.6

Table Percentage distribution of the sample according to etiology

		Count	Percent
Ischemic/hemorrhagic	Ischemic	212	81.5
	Hemorrhagic	48	18.5

Fig. Percentage distribution of the sample according to persistence

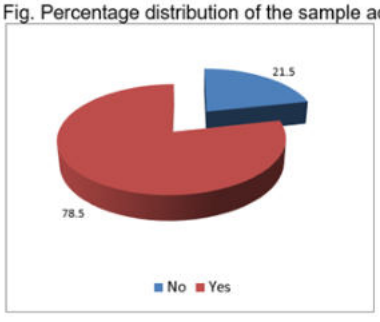

Table Association of persistance with background characteristics

		Persistence				χ^2	p
		No		Yes			
		Count	Percent	Count	Percent		
Age	<=60	40	27.8	104	72.2	7.435	0.006
	>60	16	13.8	100	86.2		
Sex	Male	32	18.6	140	81.4	2.588	0.107
	Female	24	27.3	64	72.7		
Education level	Upto 4th std	24	22.2	84	77.8	0.051	0.821
	>4 to Predegree/+2	32	21.1	120	78.9		
Marital history	Yes	40	18.2	180	81.8	9.534	0.002
	No	16	40.0	24	60.0		

*: - Significant at 0.05 level

Table Association of persistance with selected variables

		Persistence				χ^2	P
		No		Yes			
		Count	Percent	Count	Percent		
HTN	No	32	27.6	84	72.4	4.533	0.033
	Yes	24	16.7	120	83.3		
DM	No	36	22.5	124	77.5	0.227	0.633
	Yes	20	20.0	80	80.0		
DLP	No	44	22.9	148	77.1	0.825	0.363
	Yes	12	17.6	56	82.4		
Out of pocket expense	<1000	36	30.0	84	70.0	2.36	0.124
	>1000	20	14.3	120	85.7		
Had adequate income to meet expense	Yes	24	18.2	108	81.8	1.787	0.181
	No	32	25.0	96	75.0		

*: - Significant at 0.05 level

Table Association of persistance with No of medication at discharge

No of medication at discharge	Persistence				χ^2	p
	No		Yes			
	Count	Percent	Count	Percent		
<7	16	6.2	104	40	18.96	0.00001
>7	52	20	88	33.8		

*: - Significant at 0.05 level

Regarding financial aspects,53.8% had out of pocket expense >1000,50.8% had adequate income to meet expense. 78.5% had 3-month persistence. The most common reason for discontinuing medication was because they didn't know why the medication was being taken. Persistence was higher in those who knew why medication was being taken and when there was a caretaker giving pills. Adherence was found to be 35.6%. Most often drugs were stopped by patients themselves. Patients with more than 7 medicines had poor persistence to medication(p-0.032).

DISCUSSION

Risk of recurrent stroke is highest in the first 6 months,15%in first 5 years, hence the need to adhere and persist taking preventive medication after the first episode of stroke. (2)We found that approximately one-third of patients discontinued medication at the end of 3 months.

Many of the previous studies regarding persistence of medication after stroke yielded varying results. The Adherence eValuation After Ischemic Stroke Longitudinal (AVAIL) registry is a prospective study conducted in USA regarding adherence to stroke prevention medications from hospital discharge to 1 year in patients admitted with stroke or transient ischemic attack. Persistence was found to be 65.6% at the end of 1year in those patients. Factors associated with 12-month persistence in those patients included a history of hypertension or dyslipidaemia, fewer discharge medications, having an adequate income, 3-month persistence, a follow-up appointment with a neurologist, and satisfactory communications by attending physician/health care worker. 12-month persistence was highest for antihypertensive medications (87.9%), then antiplatelet (87.1%), diabetes (82.3%), lipid-lowering (77.6%), and warfarin (68.2%) medications. The adherence at 1 year was 86.6% in AVAIL registry. By medication category, adherence ranged from 94.8% for antiplatelet therapy to 90.7% for drugs preventing dyslipidemia.(3)

The Riks-Stroke Register in Sweden, another similar study, found persistence by medication categories at 2 years post discharge (e.g., 56% for statins, 74% for antihypertensive drugs) in a range similar to AVAIL registry. Factors associated with persistence included advanced age, institutional living at follow-up, absence of low mood, treatment in a stroke unit, presence of diabetes and atrial fibrillation, and good self-perceived health. Factors were different probably they recorded it from pharmacy refills and also due the differences in health care delivery system.(5)

The Preventing Recurrence Of Thromboembolic Events through Coordinated Treatment (PROTECT) study, another single entre based study,reported higher persistence rates. At 1 year of follow-up of 128 patients, antithrombotic use was found to be 98%, statins 99%, angiotensin converting enzyme inhibitors/angiotensin receptor blockers 89%, and thiazide diuretics 82%.

Baseline factors, such as age, medical history, and education level, was found to have long-term persistence. The presence of a cardiovascular diagnosis before the current episode of stroke meant fewer changes in medications at discharge, which in turn may lead to familiarity with the medications and hence longer-term persistence.(6)

In our study, those patients were with age more than 60 years were found to more persistent compared to those less than 60 years. Married people persisted better than unmarried patients. Patients taking anti hypertensives were also taking drugs persistently. Most common reason for non-persistence was because the patients did not know why medication is being taken by them. Patients with more than 7 medications were found to be less persistent, compared to those with less than 7 medications.

CONCLUSION

Various factors play a role in persistence and adherence of medications in stroke. A multifactorial intervention including patient and health care providers are warranted, because of morbidity and mortality associated with every episode of stroke.

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