ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF PHARMACEUTICAL RESEARCH AND LIFE SCIENCES

Published by ScienzTech Publication Journal Home Page: www.scienztech.org/ijprls

Clinical pharmacist interventions in post stroke follow up patients in tertiary care hospital on coastal region

Prakash A*, Kalyan Rao B, Sujitha Sri K, Lakshman Naik R, Shaik Shahin Kouser, Divya Y

Department of Pharmacology, Vishwa Bharathi College of Pharmaceutical Sciences, Perecherla, Guntur-522005, Andhra Pradesh, India

Article History:

Received on: 22 Mar 2020
Revised on: 20 Apr 2020
Accepted on: 20 Sep 2020
Published on: 05 Oct 2020

Volume: 8 Issue: 2

Keywords:

Adverse drug events (ADEs), medical reconciliation(MR), patient counselling(PC), Adverse drug reactions (ADRs)

ABSTRACT

Stroke is basically a medical condition where there is low blood flow to the brain and thus results in cell death. It remains the second most common cause of death. Stroke patients also have different comorbidities on an average where they are prescribed with 6-10 medicines. This increase the chances for drug-related problems (DRPs) and adverse drug events (ADEs) or adverse drug reactions (ADRs) and the interventions found during the follow up of stroke patients. Several studies finding of interventions in stroke patients and reconciliation are ways to reduce ADRs and improve medication use safety. Interventions and medical reconciliation (MR) address a wide array of potential medication-related issues, which is carefully planned that may be done by pharmacist or doctor or professional (or) physician. Here the aim was to access the impact of interventions which includes medications reconciliation and counselling of stroke patients and also identification and categorization of DRPs. Polypharmacy causing DRPs was statistically significant in all the regions inappropriate drug selection (2.85%), and dose selection (2.85%) was the primary cause of DRPs 85% partially solved. Epidemiologically of all the three regions (GNT, VIJ, RJY) in the total study population. Males are more affected than females. Majority of comorbidities like HTN(70.05%), and DM(47.01%)were in leading role causing stroke absorbed during interventions. Leaflet & patient counselling had prominent role in conducting medical reconciliation. Other health care professionals systematically find, differentiate & report interventions like (DRPs, ADRs, and causes).

*Corresponding Author

Name: Prakash A
Phone: 9840600640
Email: apcology@gmail.com

DOI: https://doi.org/10.26452/ijprls.v8i2.1285

Production and Hosted by

ScienzTech.org

INTRODUCTION

A stroke is defined as an acute loss of neurological function due to abnormal perfusion of brain tissue. A stroke occurs when the blood supply to part of the brain is suddenly interrupted or when a blood vessel in the brain bursts, spilling blood into the spaces surrounding the brain cell. Brain cell dies when they no longer receive oxygen and nutrients from the blood, or there is sudden bleeding into or around the brain [1].

Stroke is the second leading cause of death for people above the age of 60. It is the fifth leading cause in people aged 15 to 59. And it affects children as well as both men and women. Approximately 650,000 stroke deaths each year are being reported in Europe. 2 out of every 3 people who suffer from a stroke are from low- and middle-income countries.

Stroke is one of the main causes of death and disability in India. The estimated prevalence rate of stroke range, 84-262/100,000 in rural and 334-424/100,000 in urban areas. There is also a wide variation in case of fatality rates with highest being 42% in Kolkata. A stroke study conducted in Kolkata from 1998 to 1999 depicted a crude prevalence rate of 147/100,000 and an annual incidence rate of 36/100,000. Compared to men, women bear a substantially higher age-adjusted prevalence rate (564/100,000 for women versus 196/100,000 for men) and the incidence rate (204/100,000 for women versus 36/100,000 for men) [2].

The prevalence of stroke in India shows a considerable variation of 147-922/100,000 in various community-based studies. Several studies used age standardization with the US population as a reference; the prevalence of stroke ranged from 244/100,000 to 424/100,000. Strokes were recorded among 383 individuals during the follow-up period: 301 ischemic strokes, 59 intra-cerebral haemorrhages, 42 strokes of unknown type. Nineteen individuals experienced >1 type of stroke event, and 43 of the strokes were fatal [3].

Types of stroke

The types of strokes include:

Ischemic stroke (part of the brain loses blood flow) [4]

Hemorrhagic stroke (bleeding occurs within the brain)

The transient ischemicattack, TIA, or ministroke (The stroke symptoms resolve within minutes, but may take up to 24 hours on their own without treatment. This is a warning sign that a stroke may occur shortly.

Epidemiology of stroke in India

In India, the ICMR estimates in 2004 indicated that stroke contributed 41% of deaths and 72% of disability-adjusted life years amongst the non-communicable diseases (ICMR 2004). The Indian National Commission on Macro-economics and Health estimated that the number of strokes would increase from 1,081,480 in 2000 to 1,667,372 in 2015, The Global Burden of Disease Study projects that total deaths from stroke in India will surpass established market economies by the year 2020 [5].

Treatment of stroke

Treatment for stroke depends on whether patient is having an ischemic stroke blocking an artery —most common type — or for a hemorrhagic stroke which involves bleeding into the brain [6]

Ischemic stroke

Thrombolytics

Thrombolytics restore cerebral blood flow in patients with acute ischemic stroke and may lead to improvement or resolution of neurologic deficits [7].

IV fibrinolytic therapy at the cerebral circulation dose within the first 3 hours of ischemic stroke onset improves condition of patients with potentially disabling deficits.

IV fibrinolytic therapy at the cerebral circulation dose within 3-4.5 hours offers moderate benefits when given to all patients with potentially disabling deficits.

I-A fibrinolytic therapy by 3- to 6-hour offers moderate net benefits when applied to patients with disabling deficits and large artery cerebral thrombotic occlusions [8].

Thrombolytic drugs dissolve blood clots by activating plasminogen, which forms a cleaved product called plasmin. Plasmin is a proteolytic enzyme that is capable of breaking cross-links between fibrin molecules, which provide the structural integrity of blood clots. Because of these actions, thrombolytic drugs are also called ”plasminogen activators” and ”fibrinolytic drugs.” [Figure 1] [9].

Aim

The study aims to assess the medicine safety and efficacy of treatment in patients with ischemic stroke, hemorrhagic and TIA in the coastal region.

Objective

Patient data will be collected in the predesigned data collection form demographics, patient medical history, patient history of the disease, patient lab and diagnostic data, and medication chart will be included. Analysis and evaluation of drug treatment in stroke patients Intervention of comorbidities like diabetes and hypertension associated with stroke observe the clinical interventions by the pharmacist during stroke in comparison with standard FDA guidelines analyze the interventions of post-stroke.

MATERIALS AND METHODS

Study site

Tertiary care hospitals in the coastal region (Guntur, Vijayawada, Rajahmundry).

Study population

Both male and female patients above the age of 18 yrs.

Study duration

six months

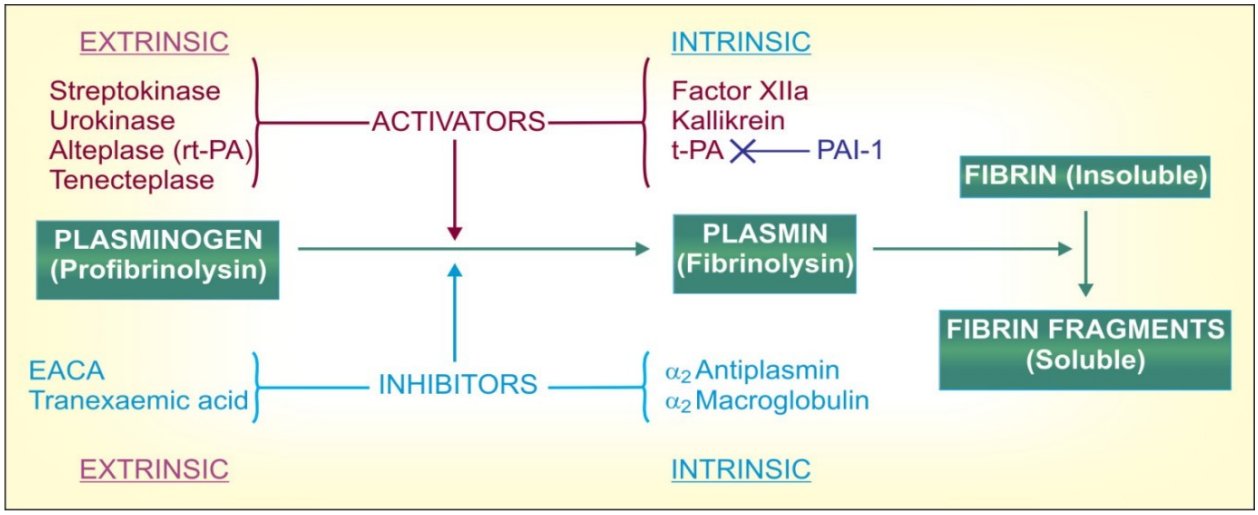

Figure 1: Mechanism of Action Of Thrombolytics

Sample size

350 patients

Inclusion criteria

Age > 18 Years

MRI & CT Confirmed stroke (ischemic, hemorrhagic, TIA).

1. National Institute of Health Stroke Scale (NIHSS) 5-42
2. MRI& CT within 6h of Symptom Onset

Written informed consent/patient complete case sheet (patient or representative)

Stroke patients with comorbidities like hypertension, diabetes, cholesterol and other profile data which is necessary.

Exclusion criteria

1. Patients below the age of 18 years are excluded.
2. Pregnancy

Study procedure

Step 1

A Descriptive observational study which is to be conducted at the cardiovascular & neurovascular department in tertiary care hospitals.

Step 2

After explaining the study procedure, the data will be collected.

Step 3

The data including demographics, patient medical history, patient history of disease and history of medication and patient laboratory and diagnostic investigations and medication chart.

Step 4

patients case sheets with all data is analyzed and categorized according to standard guidelines for the findings of interventions.

Step 5

The percentage of interventions that find out in the stroke patients are calculated.

RESULTS

Total of 350 subjects was enrolled into the study as per inclusion criteria and randomly assigned [Tables 1 and 2].

Guntur

There are 80(66.6%) male subjects and 40(33.4%)female subjects affected by stroke were observed in our study in the Guntur region [Figure 2].

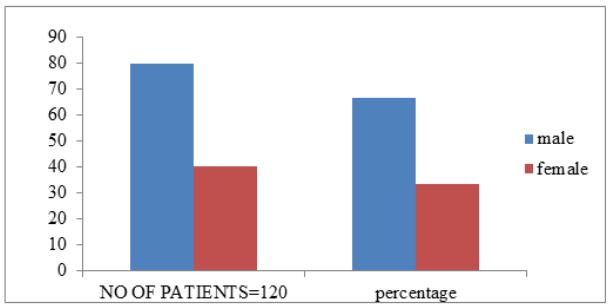

Figure 2: Age-wise distribution of patients

There are 73 HTN patients,53 DM patients and four thyroid patients of them having both HTN and DM are 37 patients and HTN and Thyroid both

Table 1: Patients enrolled in the study based on inclusion criteria

Sl. no	Primary domain	No. of problems	Percentage (%)
1	**Drug Selection**	10	
1.1	Improper drug than guidelines/ formulary	3	
1.2	Improper drug (within guidelines but otherwise contraindicated)	1	2.85%
1.3	Inappropriate combination of drugs/ herbal medication	6	
2	**Drug Form**	6	1.71%
2.1	Inappropriate drug form	6	
3	**Dose Selection**	10	
3.1	Drug dose too high	7	
3.2	Wrong/ unclear/ missing dose timing instructions	3	2.85%
4	**Drug Use Process**	9	
4.1	Improper drug administration and dosing Intervals	6	
4.2	The wrong drug administered	3	2.57%
5	**Patient-Related**	7	
5.1	Patient unable to use drug or form as directed	7	2%
6	**Others**	19	
6.1	Inappropriate outcome monitoring	7	5.42%
6.2	Other cause	9	
6.3	No obvious cause	3	

Table 2: Number of problems observed

S.No	Primary domains	Number of problems	Percentage (%)
I	**At Prescriber Level**	23	
1.1	Prescriber informed	3	
1.2	Prescriber asked information	6	15.21%
1.3	Intervention discussed with prescriber	14	
2	**At Patient-Level**	309	
2.1	Patient (drug) counselling	213	88.28%
2.2	Written information provided	96	
3	**At Drug Level**	16	
3.1	Changed drug	3	
3.2	Changed dosage	4	
3.3	Changed formulation	3	4.57%
3.4	Start of new drug/stopping of an old drug	6	
4	**Other Interventions or Activity**	13	
4.1	Other interventions	5	3.71%
4.2	Side effect reported	8	

having patients are four and one members having both thyroid and dm were observed in our study. Eighteen members have both HTN AND Alcoholic patients, same way 15 patients having both HTN and smoking and four patients are having the HTN+DM+alcoholic+smoking are observed in the Guntur region [Figure 3].

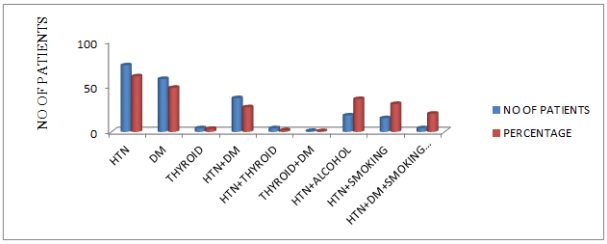

Figure 3: Comorbid conditions of patients

There are 38 patients with minor stroke, 72 patients are having a moderate stroke, six patients having moderate to severe stroke, four patients are having a severe stroke, and none of the patients is having no symptoms are studied in the Guntur region [Figure 4].

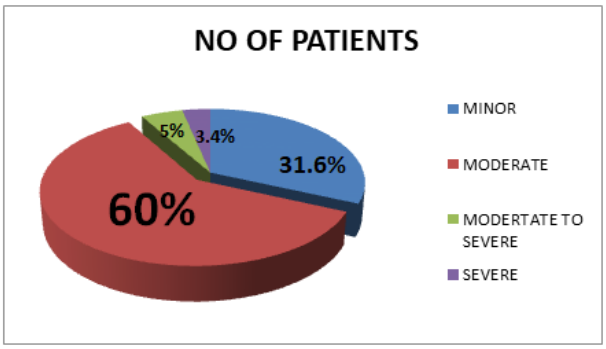

Figure 4: Various conditions of stroke in patients

Vijayawada

In Vijayawada, 79 male patients are suffered from a stroke, and 26 female patients are suffering from stroke are observed in our study [Figure 5].

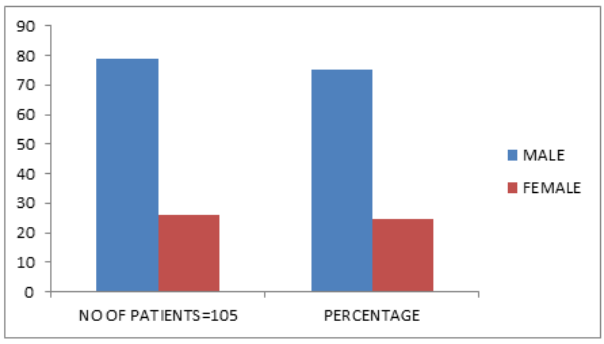

Figure 5: Distribution of patients Based on age

It indicates that 98 patients are effected under the age group of above 50 years were observed. In the same way, seven patients are effected under the age group of below 50 years were observed in Vijayawada [Figure 6].

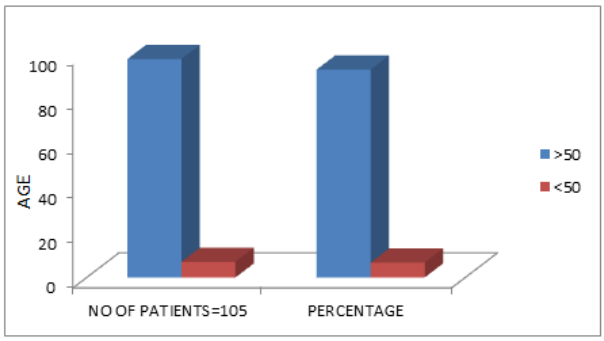

Figure 6: Distribution of patients effected

Sixty-eight patients have HTN,56 patients have DM, 13 patients are having thyroid , 40 patients have both HTN and DM, nine patients are having both HTN and Thyroid, five patients are having both DM and Thyroid,19 patients are having both HTN and alcoholic,20 patients are having both HTN and smoking, and none of them is suffered from HTN+DM+alcoholic+Thyroid+Smoking are observed in Vijayawada [Figure 7].

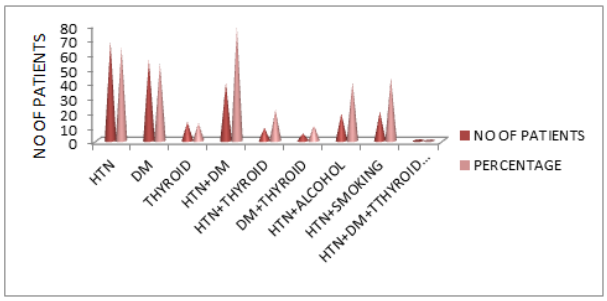

Figure 7: Comorbidities among the patient population

In the above table and pie diagram, 12 patients are having a minor stroke, 76 having a moderate stroke, two patients are suffered from moderate to severe stroke,15 patients are having a severe stroke are observed in our study [Figure 8].

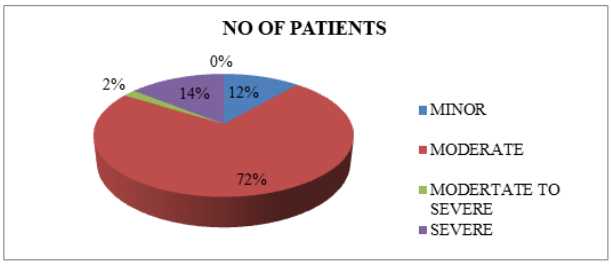

Figure 8: Severity of stroke in patients

Rajahmundry

There are 91 male patients are suffering from stroke, and 34 female patients are suffering from stroke were observed in our study [Figure 9].

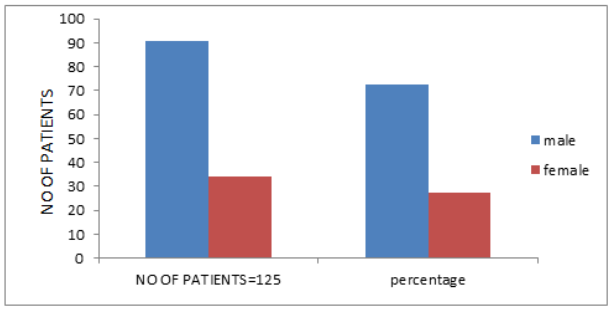

Figure 9: Distribution of patient in Rajahmundry

By observing the above table and bar diagram,106 patients are suffered from HTN, 51 patients are suffered from DM, two patients are suffered from Thyroid, 45 patients are suffered from both the HTN and DM, 51 patients are suffered from both HTN and Alcoholic, 28 patients are suffered from both HTN and smoking, and 12 patients are suffering from all HTN+DM+Thyroid+Alcoholic+Smoking were observed in our study [Figure 10].

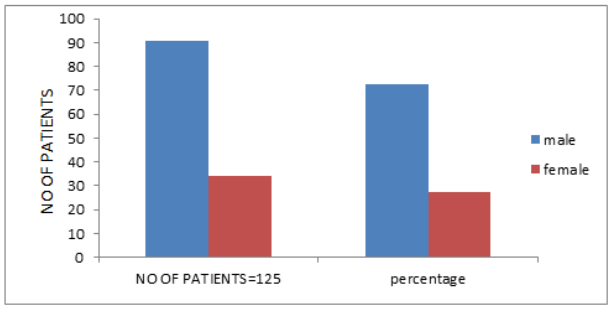

Figure 10: Comorbid conditions in the patient population

By observing the above table and pie diagram, none of them is affected with minor stroke, 64 members are affected with moderate stroke, six members are affected from moderate to severe stroke, 55 members are affected with severe stroke were observed in our study [Figure 11].

By observing the above table and pie diagram in 2o7 patients are diagnosis ischemic stroke, 105 patients hemorrhagic stroke and 38 patients are affected in TIA were observed in our study [Figure 12].

By the above table and pie chart were observed the ischemic stroke; 85 patients in Guntur region, 49 patients in Vijayawada and 73 patients are observed in the Rajahmundry region [Figure 13].

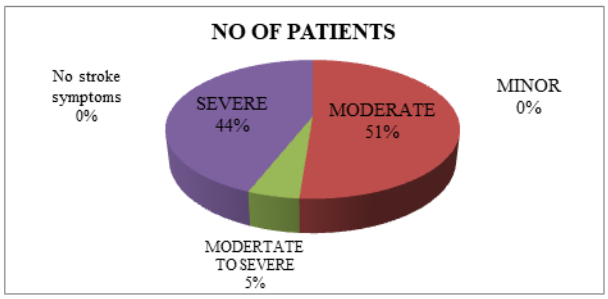

Figure 11: Severity of stroke in the patient population

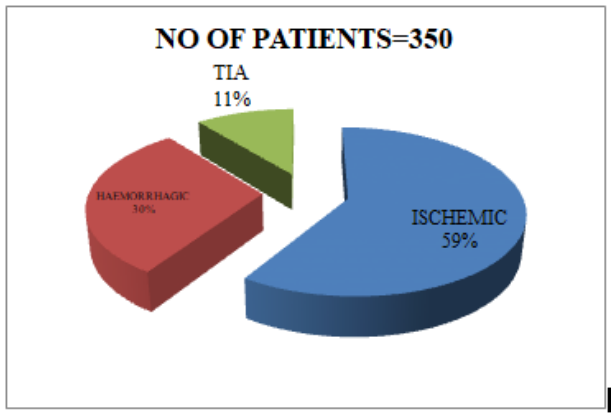

Figure 12: Observed final diagnosis

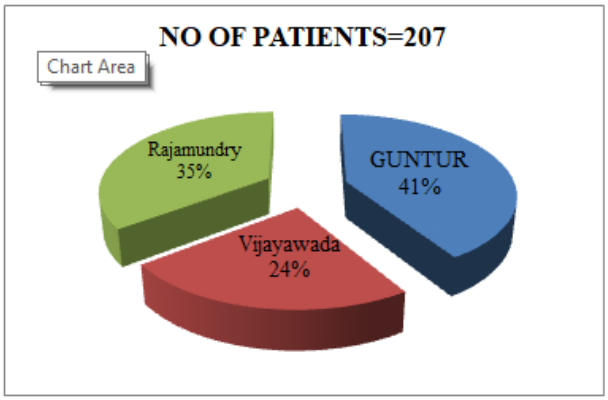

Figure 13: Prevalence of ischemic stroke in study sites

By the above pie chart observed the hemorrhagic patients; 32 patients in the Guntur region,47 patients in Vijayawada and 26 patients are observed in Rajahmundry [Figure 14].

By observing the above pie chart, nine patients are suffered from TIA in Guntur, 11 patients are suffered from TIA in Vijayawada, and 18 patients are suffered from TIA in Rajahmundry by considering the all the three regions are observed in our study [Figure 15].

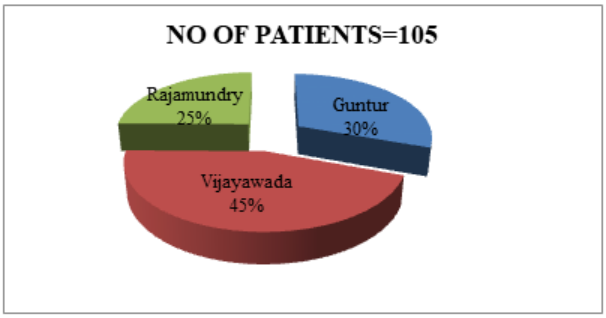

Figure 14: Prevalence of hemorrhagic stroke

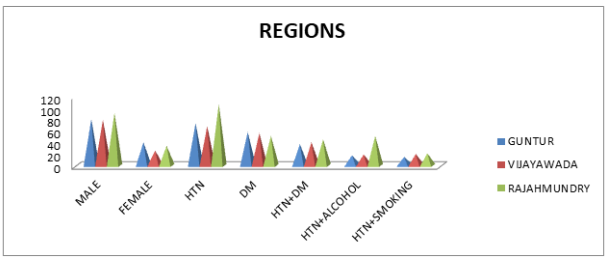

Figure 15: Prevalence of risk factors/comorbidities among the overall study population

DISCUSSION

The study that evaluates risk factors, medication adherence associated with stroke disease in a tertiary care hospital on coastal regions(Guntur, Vijayawada, Rajahmundry), Andhra Pradesh. The results were obtained after six months duration study in the neurology department of tertiary care hospital in the coastal region. A total of 350 patients enrolled in the study & the data was analyzed using Microsoft excel 2010. A total of 250 male patients and 100 female patients were having a stroke, among 350 patient in the coastal region (Guntur, Vijayawada and Rajahmundry). In Guntur region, 80 patients of male and 40 patients of the female are having stroke. 73 patients have HTN,58 patients have DM,37 patients having HTN with DM,18 patients have HTN with Alcohoic,15 patients have HTN with SMOKING. In Vijayawada region 79 patients of male and 26 patients of the female are having a stroke,68 patients have HTN,56 patients having DM, 40 patients have HTN with DM,19 patients having HTN with Alcoholic, 20 patients have HTN with smoking. In Rajahmundry region, 91 patients of male and 34 patients of the female are having a stroke, 106 patients have HTN, and 51 patients have DM, 45 patients have HTN with DM, 51 patients have HTN with Alcoholic, 21 patients have HTN with smoking. The present study reveals 207 patients were diagnosed with ischemic stroke, 105 were hemorrhagic stroke, and 38 were transient ischemic stroke in all the studied coastal regions. Off which Guntur region was found to be more with ischemic stroke patients (41%), similarly hemorrhagic stroke was higher in the Vijayawada region (44.76%). Likewise, transient ischemic stroke patients were diagnosed higher (47.36%) In the Rajahmundry region. Our results are in concordant with the earlier reports. (44)The overall observation revealed from the study was that pharmacist were integral part of the healthcare team and has a greater responsibility in reducing the DRPs in stroke patients. Monitoring the patients for DRPs shall reduce the chances of iatrogenic morbidities and contribute to improved patient care. This will enhance patient treatment outcomes and overall QOL of patients.

Limitations

The main limitation of the study is data collection is significantly less because of the age group limitation in the specified regions. The follow up is not done since the study duration is only six months. Besides, the study must be performed with a control group and multi-centrally.

CONCLUSION

This study revealed drug related problems occurring sat a frequency of 350 patients. Drug-drug interactions (25%) were prominent among drug related problems identified, followed by drug use without indication and adverse drug reactions. Polypharmacy highlighted potential risk factor for developing drug related problems. Majority of the recommendations (75%) were made to PG medical students. Although the acceptance rate of pharmacist's recommendations was found to be 97%, change in drug therapy was found only in 70%. Today, 2 out of every three people who suffer from a stroke live in low- and middle-income countries. In developed countries, the incidence of stroke is declining, largely due to efforts to lower blood pressure and reduce smoking. However, the overall rate of stroke remains high due to the aging of the population. The most upstream consequence of cerebral ischemia fundamentally is composed of an energetic problem. Early detection and documentation of drug related issues can improve patient's therapeutic outcomes.

ACKNOWLEDGEMENT

The authors are thankful to all who have extended their constant support for the completion of the work.

Funding Support

The authors declare that they have no funding support for this study.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

REFERENCES

[1] Al-Hussaini M, Mustafa S. Adolescents' knowledge and awareness of diabetes mellitus in Kuwait. Alexandria Journal of Medicine. 2016;52(1):61–66. Available from: 10.1016/j.ajme.2015.04.001.

[2] Barakat KH, Gajewski MM, Tuszynski JA. DNA polymerase beta (pol β) inhibitors: A comprehensive overview. Drug Discovery Today. 2012;17(15-16):913–920. Available from: 10.1016/j.drudis.2012.04.008.

[3] Kuś K, Wiśniewska A, Zurańska JT, Gajda M, Jawień J, Olszanecki R, et al. Antiatherogenic effect of nebivolol – the third generation β-blocker. Pharmacological Reports. 2013;65:61–61. Available from: 10.1016/s1734-1140(13)71348-3.

[4] Hamed RB, Gomez-Castellanos JR, Henry L, Ducho C, McDonough MA, Schofield CJ. The enzymes of β-lactam biosynthesis. Nat Prod Rep. 2013;30(1):21–107. Available from: 10.1039/c2np20065a.

[5] Li GR, Chen KH, Sun HY. Distinctive density, biophysical properties, and pharmacology of voltage-gated sodium current in atrial and ventricular myocytes. Heart Rhythm. 2013;10(5).

[6] Singh H, Mishra A, Mishra AK. Cleome viscosa Linn (Capparaceae): A review. Pharmacognosy Journal. 2015;7(6):326–329.

[7] Rani C, Khan IA. UDP-GlcNAc pathway: Potential target for inhibitor discovery against M. tuberculosis. European Journal of Pharmaceutical Sciences. 2016;83:62–70. Available from: 10.1016/j.ejps.2015.12.013.

[8] Kratz F, Azab SSEEA, Zeisig R, Fichtner I, Warnecke A, AACR 103rd Annual Meeting 2012. Combination therapy of doxorubicin and the acid-sensitive albumin-binding prodrug of doxorubicin INNO-206 induces complete regressions in a xenograft pancreatic carcinoma model demonstrating excellent tolerability; 2012. p. 72–72. Available from: http://doi.org/10.1158/1538-7445.AM2012-2756.

[9] Abdallah MAE, Pawar G, Harrad S. Evaluation of in vitro vs. in vivo methods for assessment of dermal absorption of organic flame retardants: A review. Environment International. 2015;74:13–22. Available from: 10.1016/j.envint.2014.09.012.

ABOUT AUTHORS

Prakash A

Dr Prakash A, M. Pharm, PhD,
Associate Professor, Department of Pharmacology,
Vishwa Bharathi College of Pharmaceutical Sciences, Perecherla, Guntur, Andhra Pradesh, India, 522005.

Cite this article: A Prakash, B Kalyan Rao, K Sujitha Sri, R Lakshman Naik, Shahin Kouser Shaik, Y Divya. **Clinical pharmacist interventions in post stroke follow up patients in tertiary care hospital on coastal region**. Int. J Pharm. Res. Life Sci. 2020; 8(2): 45-52.