Short Research Article

A STUDY ON PRESCRIBING PATTERNS AND ASSESSING THE FUNCTIONAL OUTCOMES IN CEREBRAL STROKE PATIENTS

Abstract:

Cardiovascular diseases and Cerebro-vascular diseases account for majority of the burden of –NCDs. Stroke is one the major component of these, posing public health challenges. Stroke is one of the most common neurological disorders. Stroke occurs due to any blockage or bleed of blood in the brain. 1 in 6 people suffer with stroke in their life time. This is a medical emergency condition in which ssome can lead to disability or death. As per World Health Organization criteria, ~~the~~ stroke refers to ~~is~~ rapidly developing clinical signs of focal or global disturbance of cerebral function, with symptoms lasting greater than or equal to 24hrs or longer or leading to death. The impact of stroke can be short or long term, depending on which part of the brain is affected and how quick it is treated. Stroke survivors ~~can~~ experience wide ranging disabilities including difficulty with mobility and speech, as well as how they think and feel. This hospital based case study was undertaken with aim to study the prescribing pattern and ~~to assess~~ the functional outcomes in cerebral stroke . This study was conducted to describe and obtain the baseline data about the prescribing pattern of drugs in stroke patients as well as~~nd to assess the~~ functional outcomes of~~in~~ stroke patients. Study was carried out in the Santhiram Medical hospital, Nandyal, Andhra Pradesh, India. Patients visiting the neurology clinic were asked to answer the questionnaire covering functional outcomes by using..To determine the clinical status of the patient;Most of the patients' data were collected from case sheets and laboratory reports of patients. Among patients who visited the clinic, they~~patients~~ were categorized into Ischemic stroke and hemorrhagic stroke patients. The prescription pattern of various drugs used in stroke and the functional outcomes questionnaire were also recorded in patients recruited. A total of 150 patients were included in the prospective observational study . data from~~Where their~~ case sheets were analysed to assess the prescribing pattern and the questionnaires like mRS

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Comment [JK2]: I think it would be better if you rather said "observational study" because the study seems to have both prospective and retrospective approaches??? Is this right?

Comment [JK3]: How about the laboratory reports?

,SSQOLS,MMSE scales were used to interview the stroke patients to assess the functional outcomes. Out of 150 patients involved in the study, patients presented with symptoms like slurred speech, followed by weakness on right side patients, headache , change in speech, weakness on left side and deviation of mouth . The most common risk factors associated with the stroke was Diabetes Mellitus in 60(40%),hypertension in 55(36.6%) patients, followed by coronary artery disease in 25 (16.66%) patients, smoking in 41 (27.33%) patients, alcohol in 45 (30%) patients and tobacco chewing in 07(4.66%). Majority of the stroke patients was prescribed with anti platelets (96%)–, Mannitol (93.3%), dyslipidemics (92%), a~~A~~nti-hypertensives (69.3%) anticoagulants (5.3%%). Our study presents that there is a minimal mRS score progress in patients. MRS functional outcomes before initiation of therapy and after completion of therapy were (3.94%) and ~~and after completion of therapy is~~ (1.294%) respectively. SSQOL functional outcomes after the therapy were~~as~~ ~~found to be (~~Excellent (-42.85%), Moderate (-42.85%), -Poor(-14.28%). MMSE scale was found to be ~~(~~Questionably significant (-91.42%), Mild -(8.57%), –which showed ~~s~~ improvement in the quality of life and cognition in stroke patients after treatment. In ~~We~~ conclusion~~de~~, ~~that~~ significant functional gains in rehabilitation process of stroke can be attained by -combination therapy, lifestyle changes, and better management of risk factors said to possess the major effect on recovery of stroke with improved quality of life and symptoms.

Comment [JK4]: This should be taken to the methods section of the abstract.

Comment [JK5]: This is a good opening sentence for results BUT I would recommend you supply frequencies and percentages for each of the major symptoms which were seen in patients, so that the sentence has a much better presentation.

Comment [JK6]: May need to define this abbreviation on first use.

Comment [JK7]: Which of the two abbreviations (of MRS and mRS) are you using?

1. KEY WORDS:

Glyceryl Trinitrate, Nitroglycerin, Numerical pain scale, chest pain, Acute Coronary Syndrome.

2 .Introduction:

Cardiovascular diseases and Cerebro-vascular diseases account for majority of the burden of -NCDs. Stroke is one the major component of these, posing public health challenges. Stroke is one of the most common neurological disorders. Stroke occurs due to any blockage or bleed of blood in the brain. There are three types of strokes they are- —Ischemic stroke, Hemorrhagic stroke and Transient ischemic attack(TIA)1 in 6 people suffer with stroke in their life time. This is a medical emergency condition in which some can lead to disability or death. As per World Health Organization criteria, the stroke is rapidly developing clinical signs of focal or global disturbance of cerebral function, with symptoms lasting greater than or equal to

24hrs or longer or leading to death.[1]. The impacts of stroke can be short or long term, depending on which part of the brain is affected and how quickly it is treated. Stroke survivors can experience wide ranging disabilities including difficulty with mobility and speech, as well as how they think and feel. This study is aimed to discuss in detail about studying the prescribing patterns and assessing the risk factors influencing functional outcomes and to determine the average drug encounters for prescriptions in stroke patients. Functional outcome is an important issue for quality registers to cover. To enable self reporting by patients, next-of-kin or care givers, the corresponding questions have to be concrete, unambiguous and easy to interprete. Functional outcomes which are measured by means of disability and individual loss of independence of daily activities are considered to be the most significant patient outcomes. ~~These~~ functional assessment scales[3] covers the entire range of functional outcomes from no symptoms to death. In this study we are using- Modified rankin scale[4], Stroke specific quality of life scales [6] and cognitive assessment scale for stroke patients[5] to assess the patient functional outcome. Stroke carries a high risk of death. Survivors can experience loss of vision and/or speech, paralysis and confusion. Stroke is so called because of the way it strikes people down. The risk of further episodes is significantly increased for people having experienced a previous stroke. The risk of death depends on the type of stroke. Transient ischemic attacks or TIA – where symptoms resolve in less than 24 hours – have the best outcome, followed by stroke caused by carotid stenosis (narrowing of the artery in the neck that supplies blood to the brain). Blockage of an artery is more dangerous, with rupture of a cerebral blood vessel the most dangerous of all.

Comment [JK8]: Include their abbreviations

Comment [JK9]: Move this to the methods section

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TABLE NO 1.1: Gender wise distribution

GENDER	NO. OF PATIENTS (N =150)	PERCENTAGE (%)
MALE	80	53.33%
FEMALE	70	46.66%
TOTAL	150	99.99%

Our study reported that stroke in males were found to be 80 (60%) and females were found to be 70 (40%) respectively. Similarly to one study done by (P.N. Sylaja, MD,DM, et al.)

Comment [JK11]: Start a results section from here

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Table No 1.2 Age Wise distribution of patients

AGE	MALE	PERCENTAGE (%)	FEMALE	PERCENTAGE (%)
0 – 20	**0**	**0%**	**0**	**0%**
20 -40	**6**	**4%**	**8**	**5.33%**
40 -60	**30**	**20%**	**32**	**21.33%**
60 -80	**36**	**24%**	**28**	**18.66%**
80 -100	**8**	**5.33%**	**2**	**1.33%**
TOTAL	**80**	**53.33%**	**70**	**46.65%**

This finding was closely related with the study done by (Sapna E. Sridharan, MD; J.P. Unnikrishnan, M.Phil, et al.). Most common age group individuals experiencing stroke were in between 50-70 years of age. Stroke is a disease of

aging – most strokes occurs in people >65 years. Aged patients have higher mortality and poorer quality of life after stroke compared with younger patients

Table No 6.3 Co-morbid conditions of patient

CO -MORBIDITIES	NO. OF PATIENTS (N =150)	PERCENTAGE (%)
HYPERTENSION	55	36.66%
DIABETES MELLITUS	60	40%
CORONARY ARTERY DISEASES	25	16.66%
OTHERS	10	6.66%
TOTAL	150	99.98%

Table No. 1.4 Social Habits of Patients

HABITS	NO. OF PATIENTS (N =150)	PERCENTAGE (%)
SMOKER	41	27.33%
ALCOHOLIC	45	30%
CHEWING TOBACCO	07	4.66%
NO HBITS	57	38%
TOTAL	150	99.99%

Table No. 1.5 Type wise categorization of Stroke patients

TYPES	NO. OF PATIENTS (N=150)	PERCENTAGE (%)
ISCHEMIC STROKE	92	61.33%
HEMORRHAGICSTROKE	48	32%
TRANSIENT ISCHEMIC ATTACK	10	6.66%
TOTAL	150	99.99%

Table No. 1.6 Patients with Recurrent CVA

CATEGORY	NO. OF PATIENTS (N =150)	PERCENTAGE (%)
OLD CVA	25	16.66%
NO OLD CVA	125	83.33%
TOTAL	150	99.99%

Among 150 patients 25 individuals (16.66%) of the patients were found to have recurrentCVA.

Table 1.7 Prescribing Patterns of Drugs

Class of Drugs	No. of patients (n =150)	Percentage (%)
DIURETICS	140	93.3%
ANTI HYPERTENSIVES	104	69.3%
ANTIPLATELETS	144	96%
ANTI HYPERLIPIDEMICS	138	92%
NOOTROPICS	98	65.3%
ANTICOAGULANT	8	5.3%
ANTI DIABETIC	54	36%
VITAMIN SUPPLEMENTS	150	100%
ANTIBIOTICS	56	37.3%
PPI'S	148	98.6%
ANALGESICS	26	17.3%
BRONCHODILATORS	26	17.3%
STEROIDS	12	8%
ANTI EMETICS	22	14.6%
ANTI EPILEPTICS	40	26.6%
LAXATIVES	6	4%
ANTI DEPRESSANTS	4	2.6%
PSYCHOSTIMULANTS	6	4%
BENZODIAZEPINES	6	4%
ANTI VERTIGO	8	5.3%
ANTIPYRETICS	2	1.3%
ENEMA	36	24%

Table 1.8 Route of Administration of Drugs

ROA	FREQUENCY	PERCENTAGE (%)
INJECTABLES	300	50%
ORAL	270	45%
INHALES	20	3.33%
TOPICAL	10	1.66%
TOTAL	600	99.99%

Most of the drugs are prescribed in Intravenous route 50%,followed by oral route45%.Inhalations were prescribed in 3.33% of prescriptions.

Table No.2.0 Prescription Analysis

PRESCRIPTION CATALOG	RESULTS
Total number of prescription analyzed	**150**
Total number of medications prescribed	**600**
Average number of medications per prescription	**9.6(1-10)**
Percentage of medications prescribed by generic	**75%**

S. NO.	PRESCRIPTION INDICATORS	VALUE
1.	Average number of antibiotics per prescription	18.66%
2.	Percentage of drugs prescribed by generic name	72%
3.	Percentage of encounters with antibiotics prescribed	37.3%
4.	Percentage of encounters with an injection prescribed	50%

Table No 2.1 Modified Rankin Scale Before treatment

BEFORE TREATMENT MRS	NO. OF PATIENTS	PERCENTAGE (%)
Minimal disabilities	1	2.94%
Moderate disabilities	23	67.64%
Severe disabilities	29	29.41%

Table No 2.2 Modified Rankin Scale after treatment

AFTER TREATMENT MRS	NO. OF PATIENTS	PERCENTAGE (%)
No disabilities	13	38.23%
Minimal disabilities	14	41.17%
Moderate disabilities	7	20.58%
Severe disabilities	0	0%

Table No 2.3 MMSE Scale Score Interpretations

SCORE	DEGREE OF IMPAIRMENT	NO. OF PATIENTS	PERCENTAGE (%)
25 – 30	Questionably significant	32	91.42%
20 – 25	Mild	3	8.57%
10 – 20	Moderate	0	0%
0 - 10	Severe	0	0%

- The degree of impairment in patients are questionably significant 91.42% and in some it is mild-8.57% that indicates there was improvement in patients after therapy.

Table No 2.4 SS-QOL Scale Score Interpretations

SCORES	QOL	NO. OF PATIENTS	PERCENTAGE (%)
150 – 170	Poor	5	14.28%
200 – 230	Moderate	15	42.85%
230 - 245	Excellent	15	42.85%

The QOL of patients were moderate -42.85% and excellent -42.85% and poor QOL was seen in 14.28% which indicates improvement in quality of life of patients after treatment.

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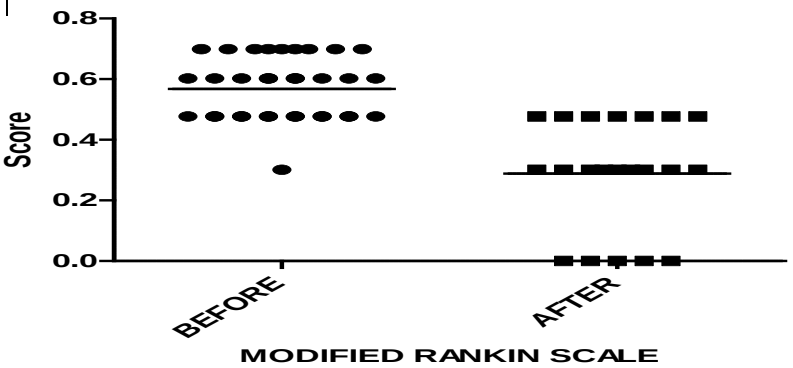

- Paired t test, P value < 0.0001, significant different (P < 0.05)-Yes
- That means after treatment patients are improved from disease state whencompared to beginning

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Discussion:

This study included 150 patients of Cerebral Stroke attending in Neurology In and Out patient department of tertiary care teaching hospital. Patient Proforma include different parameters like Age, sex, Chief complaints, diagnosis, Radiographic investigations, management, functional outcomes assessment before and after stroke therapy by using functional assessment scales. Among all those patients 150 cases collected for the study. Out of 150 study sample, was observed to be 80 males and females are 70. as shown in the Table No.1.1. This study conducted in the age group of 20-100 years. In Males Cerebral Stroke condition was observed to be more in the age group of 60-80, compared to the age group of 40-60, less in the age group of 20-40, 80-100 and there are no patients in the age group of 0-20. In females Cerebral Stroke condition was observed to be more in the age group of 40-60, compared to the age group of 60-80, less in the age group of 20-40 & 80-100. Cerebral Stoke was observed more in the age group of 50-70 in both males and females, less in the age group of 20-40 & 80-100. Out of 150 patients of Cerebral Stroke More in the age group of 40-60 years (21.33%) and in the age group of 60-80 years (18.66%)., less in the age group of 20-40 years (5.33%) and in the age group of 80-100 years (1.33%) as shown in the Table No 1.2.

Comment [JK15]: These should be in the results section.

In this study, the mean age group of the patient was 55.55years. This finding was closely related

with the study done by (Sapna E. Sridharan, MD; J.P. Unnikrishnan, M.Phil, et al.)[56]. Most common age group individuals experiencing stroke were in between 50-70 years of age. Stroke is a disease of aging – most strokes occurs in people >65 years. Aged patients have higher mortality and poorer quality of life after stroke compared with younger patients. Stroke in younger patients was found to be 34 members. Our study reported that stroke in males were found to be 80 (60%) and females were found to be 70 (40%) respectively. Similarly one study done in (P.N. Sylaja, MD, DM, et al.)[57]. Out of total patients in our study, most of the patients were found to have suffered with an Ischemic stroke. These findings were similar to be (Jeyaraj Durai Pandian, et al.)[58].Most of the patients presented with predominant symptoms like sudden weakness of upper and lower limbs, slurring of speech, hemiparesis, altered sensorium, deviation of mouth angle etc.,. Our study identified the most common risk factors were associated with Hypertension followed by Diabetes Mellitus, Heart diseases, Alcohol consumption, smoking ; HTN-55patients –36.66%, DM –60 patients -40%, Heart diseases - 25 patients - 16.66%, Alcohol -45 patients - 30%, Smoke- 41 patients -27.33%. The incidence of stroke was higher in patients with positive family history than in patients with a negative family history. In our study most of the patients were prescribed with the drugs as follows : Vitamin supplements-(Rejunex forte, Optineuron) were given to 150 patients -100%, Dyslipidemics-(Atorvastatin) were given to 138 patients -92%, Anti-platelets-(Clopidogrel, Aspirin) were given to 144 patients -96%, Osmotic Diuretics-(Mannitol) were given to 140 patients -93.3%, Anti-HTN-(Minipress, cilidin labetolol, Telva, Nicardia) were given to 104 patients -69.3%, Psycho-stimulants were gi–ven to 98 patients -65.3%, Antibiotics-(Monocef, Metrogyl, Zostum, Piptaz, Meropenum) were given to 56 patients - 37.3%, PPI-(Pantoprazole) were given to 148 patients -98.6%, Anti-Diabetic-(Glycomet, Metformin) were given to 54 patients -36%, Anti-epileptic-(Levera, Gabapin) were given to 40 patients -26%, Bronchodilators-(Duolin, Mucomix) were given to 26 patients - 17.3%, Anti-coagulants-(LMWH) were given to 8 patients.

In our study patients presented, higher MRs score at initiation (3.94%) of medcial therapy indicating moderate to moderately severe disability, thus requiring a proper medical therapy including physical therapy. After the completion of therapy patients presented with reduced MRs score (1.294%) indicating slight disability where the patients are able to look after their own affairs without assistance. The results of SSQOL functional outcomes after the therapy was found to be (Excellent-42.85%, Moderate-42.85%, Poor- 14.28%) and MMSE scale was found to be (Questionably significant-91.42%, Mild- 8.57%) which indicates that the patients condition is normal but a slight functional abnormality is seen in the subjects. The paired t test was performed for this study we were conducted functional outcomes of before and after the stroke therapy. so we used paired t test as the statistical tool. The efficacy of p value is 0.0001 and p value less than the tabular value of t test as shown in Table No 2.1. The stroke community has made substantial progress in outcome assessment methodology/ measures, but there is still more to do to improve the outcomes in patients. Even with an appropriate outcome measures and statistical analysis plan, demonstrating a treatment effect of a stroke interventions is not easy. The presence of Stroke was higher in patients with positive family history than the patients with a negative family history, ischemic stroke tends to aggregate to families with a positive history, which was noticed in our study. The strength of our study is it helps to identify the cases with predominant symptoms of stroke and to estimate numerous risk factors in such patients. The sample size is 150 which facilitates better analysis of prescription. The inclusion criteria of our study isthe patients >20 years which helps to analyze in detail regarding the cause of stroke in young patients. The functional assessment scales which are used for interviewing the patients before and after the treatment aids to assess the patients condition (with regarding to the treatment). The limitations of our study are the study population for the functional assessment scales are less in number such as 35 patients only but maximum extent of the patients has shown increased functional outcomes. Few of the patients accepted to participate in the study but didn't co-operate with the study while interviewing the patients. If the study population for the functional assessment scales is high in number then vast no. of patients can be interviewed and the maximum number of patients can be assessed for functional outcomes but due to less time period of our study we were unableto interview the remaining patients.

Comment [JK16]: This is irrelevant. You do not to include it.

Conclusion:

This study concludes that the various drugs prescribed in stroke patients such as anti-platelets, Dyslipidemics, Anti-hypertensives, Psycho-stimulants. Drugs to be administered for conditions occurring after the initial event (epilepsy, dementia, depression) like anti-epileptics and psycho-stimulants were additionally prescribed for a few patients. MRS functional outcomes before initiation of therapy (3.94%) and after completion of therapy is (1.294%). SSQOL functional outcomes after the therapy was found to be (Excellent-42.85%, Moderate-42.85%, Poor-14.28%). MMSE scale was found to be (Questionably significant-91.42%, Mild- 8.57%) which shows improvement in the quality of life and cognition in patients after treatment. Thus the results of our study demonstrated significant functional gains in rehabilitation process of stroke, combination therapy, lifestyle changes, and better management of risk factors said to possess the major effect on recovery of stroke with improved quality of life and symptoms.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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