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RESEARCH ARTICLE

EVALUATION OF RISK FACTORS AND TREATMENT PATTERNS OF CVA

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Abstract

Back ground: Cerebro Vascular Accident is a rapidly developing signs of focal disturbances which lasts for more than 24hours and is divided into 3 types- Ischemic stroke, Hemorrhagic stroke, Transient ischemic stroke.

Objective: To assess drug treatment pattern of anti-platelets, the involvement of clinical pharmacist to improve the patient outcome, the risk factors of stroke and monitor the risk of anti-platelets.

Methods and methodology: A hospital based prospective observational study is conducted in neurology and general medicine department for 6 months meeting the inclusion criteria by obtaining information from the case sheets, laboratory reports and on an interview with the patient.

Discussion: Among 80 patients, most of the cases reported were from the age group of 51-60yrs and males were more prone to stroke. Ischemic stroke is seen majorly and strokes are mostly diagnosed with MRI,CT scan, ECG and were treated with Aspirin and Atorvastatin (symptomatic treatment).

Conclusion: Stroke (Cerebro Vascular Accident) is the second leading cause of death. Major risk factors of stroke include hypertension and diabetes mellitus. Prevention of these diseases can prevent stroke. People with these diseases are risk factors to stroke. With lifestyle modifications and medication adherence can reduce the risk of stroke. According to the study, majority of patients were males, people who smoke and consume alcohol are also prone to stroke. In this study, we dealt with the risk factors of stroke and its treatment options and lifestyle modifications which can prevent the risk of stroke.

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Introduction:-

Stroke was defined by World Health Organisation (WHO) as the “rapidly developing clinical signs of focal disturbances the cerebral function, which is lasting more than 24 hours or which might lead to death, which has no apparent cause other than the vascular origin[10]. “ Cerebro Vascular Accident is accounting for 11.13% of total deaths and is the major (Second) cause of dysfunction world wide. The majority of stroke victims continue to live with disabilities.

Types of stroke:

Stroke is mainly of three types. They are,

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Ischemic stroke
Hemorrhagic stroke
Transient ischemic stroke (TIAs) [11].

Ischemic strokes:

Ischemic strokes are either due to local thrombus formation or emboli occlusion to a cerebral artery. Cerebral atherosclerosis is the cause in most of the cases, but 30% are of unknown etiology. Emboli arise either from intra or extra-cranial arteries and 20% of ischemic stroke arise from the heart.

Formation of thrombus and embolism results in arterial occlusion, decreasing cerebral blood flow and causing ischemia, at last leading to infarction [1].

Haemorrhagic stroke:

Hemorrhagic strokes (i.e., 13% of strokes) are of three types. They are
Subarachnoid hemorrhage (SAH)
Intracerebral hemorrhage

Subdural hematomas

Subarachnoid hemorrhage (SAH) may develop from trauma or rupture of an intracranial aneurysm or arterio-venous malformation (AVM)

Intracerebral hemorrhage arises when a ruptured blood vessel within the brain motives a hematoma.

Subdural hematomas are routinely caused by trauma [1].

Transient ischemic attacks:

A transient ischemic attack is a medical emergency. A transient episode of neurologic dysfunction which is mainly due to the focal brain, spinal cord, or also retinal ischemia, without acute infarction or tissue damage lasting less than 24 hours and usually less than 30 minutes is known as transient ischemic stroke.

Epidemiology:

15 million people suffer from stroke worldwide per annum in keeping with World Health Organisation. Of those 5 million die, and another 5 million are permanently paralyzed [4]. It is the second leading cause of death.

Etiology:

Stroke is mainly precipitated due to hypertension, diabetes mellitus, atrial fibrillation, carotid artery stenosis, dyslipidemia, cigarette smoking, obesity, alcohol, plaque, atherosclerosis, intracranial atherosclerosis, myocardial infarction, transient neurological deficit.

Risk factors are further subdivided into 3 types. They are -

1. Modifiable risk factors – Hypertension, Diabetes Mellitus, Atrial fibrillation, Smoking.
2. Non modifiable risk factors – Age, Sex, Race, Genetic factors.
3. Potentially modifiable risk – Migraine, Alcohol abuse.

Muscular abnormalities:

Gait abnormality, instability, paralysis with weak muscles, incoordination, spasticity, overactive reflexes, or hemiparesis.

Visual abnormalities:

Blurred vision, diplopia, sudden vision loss, or temporary loss of vision in one eye or both.

Speech disorders:

Dysphasia, slurred speech, or sometimes speech loss.

Limb abnormalities:

Numbness or weakness of limbs especially one side of the body.

Facial abnormalities:

Muscle weakness or numbness usually on one side or both [6].

Also common:

Dysphagia, headache, inability to understand, mental confusion, or rapid involuntary eye movement.

Pathophysiology:-**Ischemic stroke:**

Thrombosis can form in the extra cranial and intracranial arteries when the intima is roughened and formation of plaque along the damaged vessel. The endothelial injury (roughing) enables the platelets to adhere and aggregate, then coagulation is stimulated and thrombus develops at the site of the plaque. Blood flow through the extra cranial and intracranial systems declines, and the collateral circulation maintains function. When the compensatory mechanism of collateral circulation fails, perfusion is negotiated, leading to depreciate perfusion and cell necrosis.

Hemorrhagic stroke:-**Intracerebral haemorrhage:**

Intracerebral haemorrhage into the subarachnoid space can develop from weakened blood vessel walls (i.e., aneurysms) usually caused by congenital defects, trauma, infection, and hypertension. Blood can leak deliberately from the involved vessel or the aneurysm may rupture suddenly. The direct association of blood with brain tissue irritates and injures the brain cells.

Subarachnoid haemorrhage

The subarachnoid space is the part between the brain and skull. It is filled with cerebrospinal fluid (CSF), which acts as a floating cushion to shield the brain. When blood is released into the subarachnoid space, it irritates the lining of the brain, enhances pressure on the brain, and injures brain cells.

Diagnosis:

In all patients, routine blood screening should involve full blood count to study for polycythaemia, thrombocythaemia, or thrombocytopenia. Anaemia of chronic disease might be a marker for endocarditis or underlying cancer. Intermittent haematological malignancies may be complicated by stroke. Basic coagulation analysis (INR, International normalized ratio; APTT, Activated Partial Thromboplastin Time; thrombin time and fibrinogen) must be undertaken in all patients with haemorrhagic stroke and is especially important in those receiving anticoagulants. Urea and electrolytes instruct homeostatic management in the acute phase and may also affirm end-organ damage from hypertension or vasculitis. Patient's suffering from compelling electrolyte imbalance may present with global or focal dysfunction mimicking stroke. Plasma glucose is a fundamental 'triage' investigation, as hypoglycaemia must be precluded in anyone with focal signs. Hyperglycaemia may recommend unidentified diabetes and is also found in non-diabetics with severe stroke. Lipid analysis for cholesterol and fasting triglyceride tests should be performed. There were also arguments for performing syphilis serology in all patients. Erythrocyte sedimentation rate (ESR) is used as a non-specific screening test, predominantly for inflammatory arterial disease and endocarditis. Thyroid function tests should also be performed in all patients with atrial fibrillation. In all patients chest X-ray and electrocardiography (ECG) must be carried out. If they are both normal this may rebut the need for echocardiography. The principal point of chest radiology is to institute the presence of a normal cardiac silhouette. The principal ECG changes emphasize left ventricular hypertrophy secondary to hypertension, previous or acute myocardial infarction (which may suggest cardiogenic embolus), and chiefly, atrial fibrillation.

Management of stroke:**Pharmacological treatment of stroke:****Acute treatment:**

tPA - 0.9mg/Kg- IV within 4.5 hours of onset

ASA (Acetyl salicylic acid) - 160 -325mg - started within 48 hours of onset daily.

Secondary prevention:

Non-cardio embolic:

Anti-platelet treatment - Aspirin

Aspirin 25 mg + extended-release Dipyridamole - 200 mg -BD

Clopidogrel - 75 mg – daily.

Cardio embolic (especially atrial fibrillation) : Abixaban - 5 mg - daily

Dabigatran - 150 mg - BD
 Rivaroxaban - 20 mg - daily
 Atherosclerosis + LDL > 100 mg/dl - high intensity statin therapy
 Blood pressure > 140/90 mmHg - blood pressure reduction ^[1]

Other drugs (symptomatic treatment):

Statin therapy :

it is used to decrease the liver's production of harmful cholesterol.
HMG CoA reductase inhibitors – Reduces cholesterol.
 Ex. Atorvastatin, Rosuvastatin.

Anti hypertensives:

It lowers the blood pressure ^[6]

ACE inhibitors–Relaxes blood vessels, lowers blood pressure and prevents diabetes – related kidney damage.

Ex. Captopril.

Beta blockers: Reduces hypertension and prevents further complications

Ex. Metoprolol.

Calcium channel blockers : These drugs are usually advised in sub- haemorrhage patients for the prevention of delayed cerebral ischemia^[8].

Ex. Nifedipine, Nimodipine.

Oral hypoglycaemic agents:

reduces random blood sugar and maintains blood sugar levels

Sulfonylureas– Ex. - Tolbutamide, Glipizide.

α- glucosidase inhibitors– Ex. - Acarbose.

Nootropic agents:

Used to improve brain function

Ex – Citicholine, Piracetam^[2].

Surgical treatment:

If the blood vessel is blocked more than 50% then surgery is advised to treat stroke. Bypass surgery also known as cerebral revascularization can be performed for ischemic stroke and transient ischemic stroke caused by cerebrovascular insufficiency or decrease in oxygen supply to the brain due to narrowing of blood vessels to prevent further complications.

Carotid endarterectomy is a procedure where the partly blocked artery is opened and cleared ^[7]. Aneurysm clipping is a procedure where it is used to clip the ruptured blood vessel to prevent further complications ^[7]. Arteriovenous malformation repair is also advised in few patients to prevent the blood flow to the arteriovenous malformation ^[7].

Non-pharmacological treatment:

1. Physical activity: Physical activity exerts a beneficial protective effect on reduction of stroke risk and recurrence through the life including in older adults.
2. Eat in moderation: Include leafy green (spinach), fruits and lean meats and consume less sodium.
3. Check blood pressure regularly.
4. De-stress. Take a walk every morning after breakfast. When you exercise, reach the level at which you are breathing hard but can still talk. If you don't have consecutive 30 minutes to exercise, break it up into 10 to 15 minute sessions a few times each day.
5. Get routine check-ups.
6. Try to have more meatless meal. Eating more of a plant-based diet ^[5] makes it easier to limit cholesterol and unhealthy fats ^[9].

Complications:-

Brain oedema:

Swelling of the brain after stroke.

Limb contractures:

Shortened muscles in an arm or leg from reduced capability to move the affected limb or lack of exercise.

Seizures:

Abnormal electrical activity in the brain causing convulsions. These are common in larger strokes.

Deep Vein Thrombosis (DVT):

Blood clots form in veins of the legs because of immobility from stroke^[3].

Aims And Objectives:-

Aim:

To evaluate the risk factors and treatment patterns in patients having stroke in tertiary care teaching hospital.

Objectives:-

1. To evaluate risk factors and suggest life style changes.
2. To asses drug treatment pattern of anti platelets.
3. To find out the most common type of stroke.
4. To evaluate whether single or combination therapy is effective.
5. To evaluate/asses the stroke based on clinical presentations and comorbidities.
6. To identify the most common cause and their complications.
7. To monitor risk of anti-platelet therapy.
8. To assess the involvement of clinical pharmacist improved the patient outcome by counselling the patient.

Methods and Methodology:-

Study design:

A hospital based prospective, observational study is conducted in neurology department and general medicine department of inpatient and outpatient of Mediciti hospital for the duration of six months meeting the inclusion criteria are enrolling into the study and obtaining information from the case sheets, laboratory reports and on interview with patient or patient representative in a suitable designed patient data collection form and further analyzed.

Sample size:

80 patients on anti platelet treatment for stroke, evaluated for the adherence or compliance to the medication and outcomes of the study.

Sample site:

Mediciti institute of medical sciences

Study period:

Six months (September 2019 – February 2020)

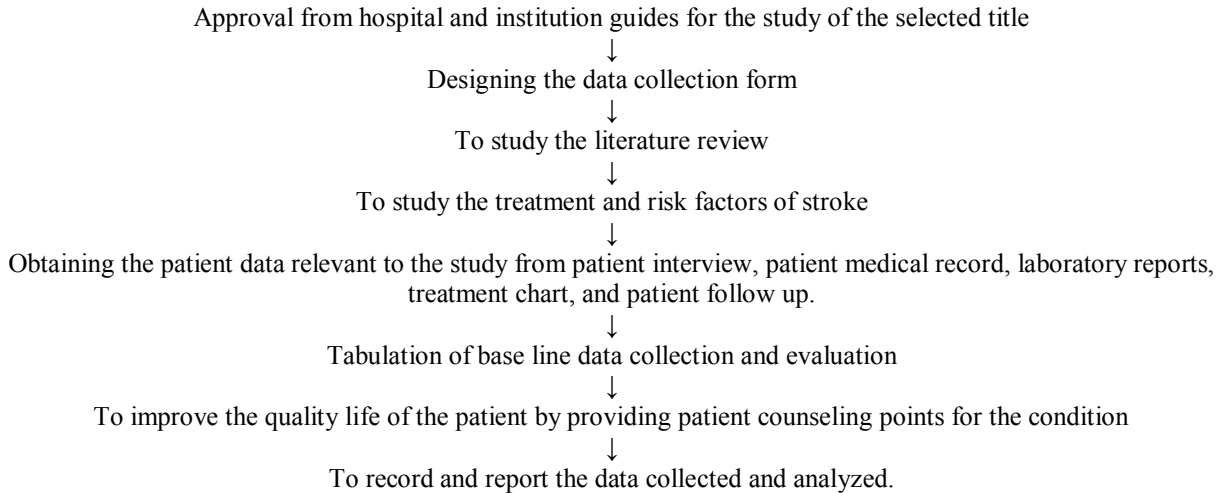
Study criteria:

Inclusion criteria:

- Patients of both genders
- Patients with all age groups
- Malignancy patients
- Patients on oral contraceptives
- Traumatic patients
- Alcoholic patients
- Smokers
- Patients with past history of stroke/ CVA
- Patients with or without comorbid conditions (hypertension, diabetes mellitus, dyslipidaemia)
- Patients willing to cooperate and volunteering to give verbal communication.

Exclusion criteria:

- Patients not expected to cooperate or unconscious and comply with the treatment
- Pregnancy patients.

Plan of work:**Sources of study:**

Data collection form (patient profile sheet).

Discussion:-**Table 1:-** Evaluation based on age and gender.

Demographic details	No. of patients	Percentage (%)
AGE (years) :		
21 - 30	03	03.75 %
31 - 40	08	10.00 %
41 - 50	18	22.50 %
51 - 60	25	31.25 %
61 - 70	17	21.25 %
71 - 80	09	11.25 %
GENDER :		
Male	56	70 %
Female	24	30 %

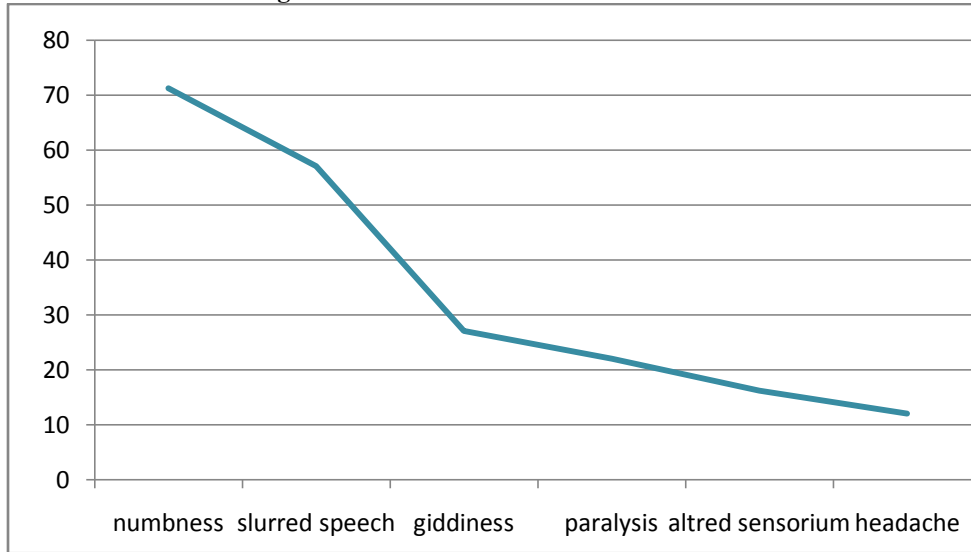
Impression: Most of the patients were from age group of 51-60years and males were more prone to stroke.

Table 2:- Evaluation based on types and risk factors of stroke.

Factors	No. of patients	Percentage %
TYPES :		
Ischemic stroke	54	67.5 %
Haemorrhagic stroke	26	32.5 %
Transient ischemic stroke	00	00 %
Risk factors :		
Hypertension	64	80.00 %
Diabetes mellitus	20	35.00 %
CVA (Past)	18	22.50 %
Alcohol	19	23.75 %
Smoking	11	13.75 %
Tobacco	01	01.25 %
CAD	02	02.50 %

Impression: Ischemic stroke is majorly seen and hypertension and diabetes were high risk factors of stroke.

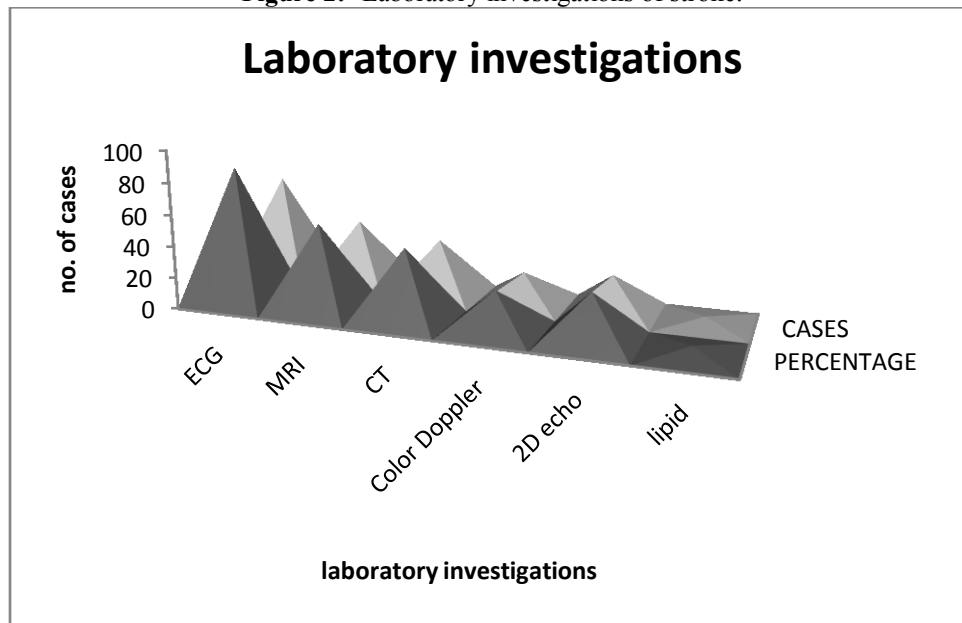
Figure 1:- Clinical manifestations of stroke.



Impression:

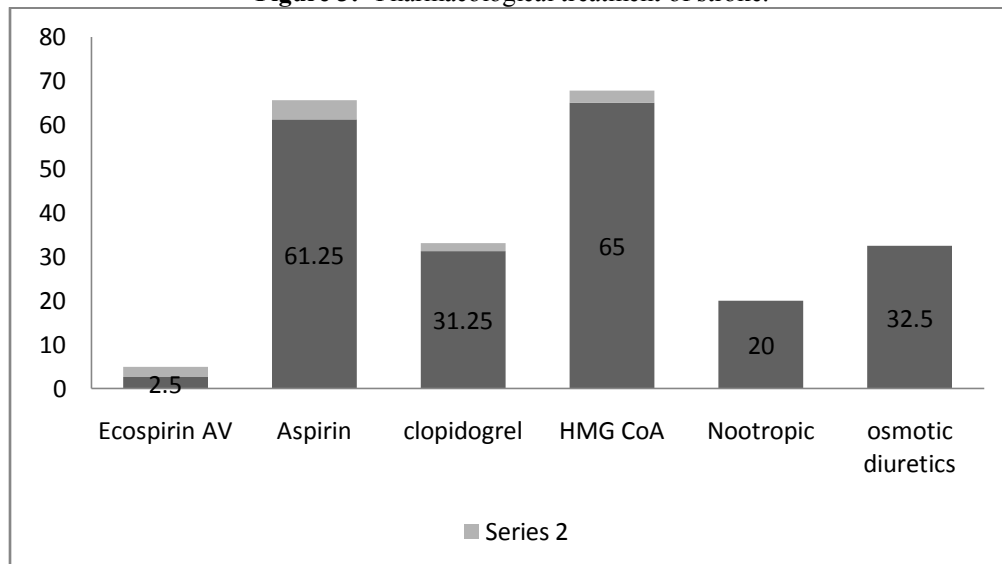
Shows the clinical manifestations of stroke in which numbness and slurred speech are identified in most of the cases and headache is less likely seen.

Figure 2:- Laboratory investigations of stroke.



Impression:

Represents the percentage of usage of laboratory technology to diagnose stroke and percentage of case abnormalities diagnosed with MRI, CT, ECG.

Figure 3:- Pharmacological treatment of stroke.**Impression:**

The above figno.3 suggests the appropriate treatment for stroke. Aspirin and Clopidogrel were the best treatment option for stroke which comes under single therapy.

Conclusion:-

Stroke (Cerebro Vascular Accident) is the second leading cause of death. Major risk factors of stroke include hypertension and diabetes mellitus. Prevention of these diseases can prevent stroke. People with diseases which are risk factors to stroke, with life style modifications and medication adherence can reduce the risk of stroke. According to the study majority of patients were males, people who smoke and consume alcohol are also prone to stroke. In this study, we dealt with the risk factors of stroke and its treatment options and epidemiology of stroke, life style modifications which can prevent the risk of stroke. Out of 80 patients, about in 69 cases, stroke abnormalities were diagnosed with ECG and approximately 44 cases were detected with MRI and are with the symptoms of numbness and weakness on one side of the body, slurred speech, dysarthria, aphasia.

With proper physical exercise and proper maintenance along with medication adherence can prevent stroke. Many people had the symptoms like numbness and weakness on one side of the body and early detection of these symptoms can reduce worsening the disease state.

References:-

1. Barbara G. Wells, Terry L. Schwinghammer, Joseph T. Dipiro, Cecily V. Dipiro – Pharmacotherapy handbook – 9th edition – Pg. No. 260-268.
2. Bentensen, H- Dietary polyunsaturated fatty acids, brain function and mental health (Nootropic) 2017.
3. Complications after stroke by stroke association.org
4. Epidemiology of stroke the internet stroke centre- Worldwide statistics.
5. <https://www.everydayhealth.com/stroke/diet/-after-a-stroke.aspx>-(non pharmacological treatment)
6. <https://g.co/kgs/sXrZFZ>-(Symptomatic treatment, Clinical manifestations).
7. <https://www.webmd.com>- (Surgical treatment).
8. Lloyd Yee Young, Mary Anne Koda Kimble- Applied therapeutics: The clinical use of drugs 6th edition.
9. Madeline R. Vann, MPH medically reviewed by Pat F. Bass III, MD, MPH- Making dietary changes after a stroke.
10. Thomas truelsen- The global burden of cerebro vascular disease (Definition).
11. Types of stroke – cdc.gov (Types).