A REVIEW ON OVERVIEW OF STROKE ALONG WITH IT'S RISK FACTORS & MANAGEMENT

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ABSTRACT

Stroke is the damage of the brain due to interruption of blood supply (or) reduction of blood supply to the brain, resulting in lack of oxygen & nutrients to the brain, thus the brain cells begin to die in minutes. CNS infarction is defined as the brain cell death (or) spinal cord attributable to ischemia includes intercerebral hemorrhage and sub arachnoid hemorrhage. Evidence revealed that D-dimer levels might have a role in the acute diagnosis of ischemic stroke subtypes, particularly thromboembolic and lacunar stroke. Elevated levels are associated with short term poor ischaemic stroke managed by interventional method and IV tissue plasmogen activator, medication delivered directly to brain.

KEYWORDS: Definition, Ischaemic stroke, Hemorrhagic stroke, D- dimer, Thrombectomy, Pathophysiology, Tissue plasmogen activator.

INTRODUCTION

A stroke happens when blood flow to the brain is decreased or stopped, causing brain cells to die. It is cerebrovascular disease which affects the blood vessels that feed brains oxygen.[1] It is now thought to be caused by high D-dimer levels. Severe acute respiratory syndrome (SARS) COVID-19 levels.[2,3] it is a major cause of death and disability globally. To distinguish between ischemic stroke and intracerebral bleeding, clinical characteristics and brain imaging are used in the diagnosis. Mostly it causes severe complications owing to risk factors such as hypertension and diabetes, as well as elevated homocysteine levels and D-dimer readings, and, in rare cases, a drop in platelet count.[5,11] Disturbance in cerebral function that lasts longer than 24 hours or leads to death and has no obvious reason other than a vascular origin.[14] The treatment focuses on fast reperfusion using intravenous thrombolysis and endovascular thrombectomy, the latter of which improve disability but are time-sensitive. There are two different forms of stroke dependent on where the clot develops. The majority of strokes are caused by artery obstruction, whereas hemorrhagic stroke occurs when bleeding exerts pressure on nearby brain cells, destroying those cells.[17] The injured region loses its ability to operate normally. This can result in neurological problems. It is exceedingly hazardous. It can be treated medically or surgically with thrombectomy. Stroke is usually caused by risk factors such as high blood pressure and diabetes.[19,28] There is no significant estimation for the risk factor. Patients above the age of 40 seem to be more likely to have a stroke. Now a days stroke due to covid -

19 cerebral hemorrhages or internal bleeding occurs due to elevation of D- dimer and rare cause of stroke is due to decrease in platelets may cause internal bleeding. Homocysteine also plays a crucial role in cause of ischemic stroke genetically.[26] It can be treated with antiplatets, anticoagulants and removal of clot.

EPIDEMIOLOGY[12]: - Stroke is ranked as second leading cause of death in worldwide with annual mortality rate of about 5.5 million, 50% of high morbidity, 50% of survivors being chronically disabled mainly effects 60% of males (50 years) & 40% of females (> 40 years).

ETIOLOGY[21, 26]
- Clots in arteries and veins that supply oxygen to brain.
- High D-dimer levels.
- Accidents.
- High blood pressure.
- Diabetes.
- Thrombocytopenia.
- Hyperglycemia.
- Obesity.
- High use of anti-coagulants.
- Deposition of stroke at blood vessels or tissues.

TYPES OF STROKE
There are 3 main types of stroke
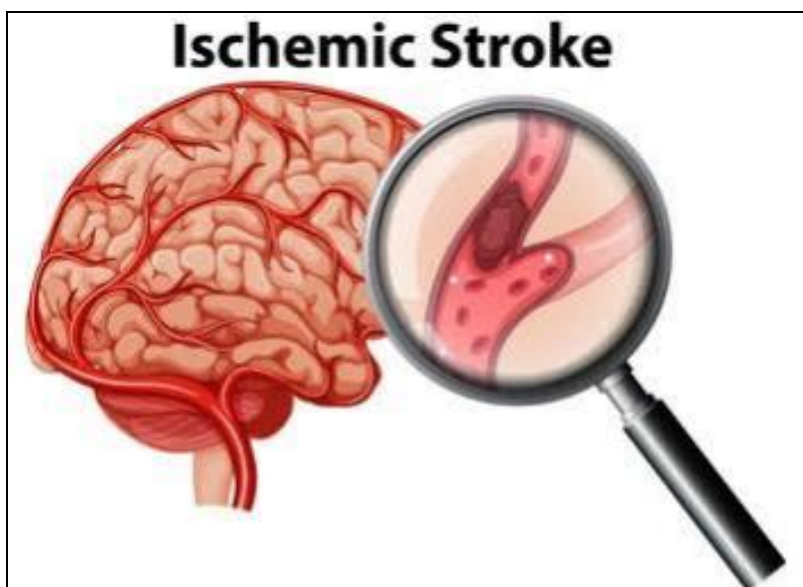- Ischemic stroke.[18,23]
- Hemmorhage stroke.

- Transient ischemic stroke.
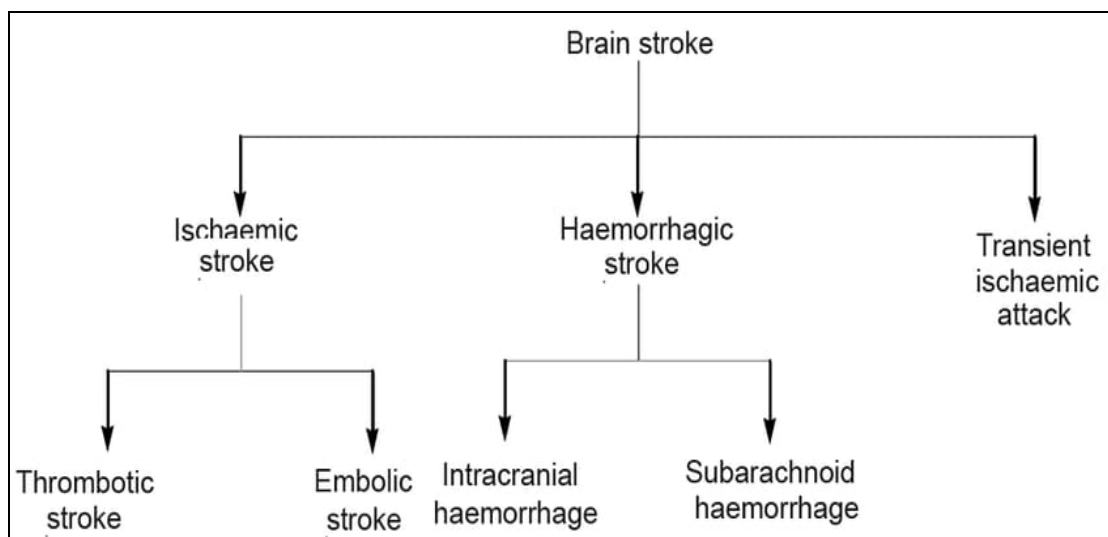
1) ISCHAEMIC STROKE
It is common cause of stroke, about 87% cases are Ischaemic stroke. It occurs when blood flow passes through the artery that delivers oxygen rich blood to the brain is blocked, which often cause the blockage.

2) HEMORRHAGIC STROKE
This form of stroke happens when a blood vessel in the brain leaks or ruptures. This leaked blood puts too much pressure on brain cells which damages them.

It is again classified into 2 types,
- Intracerebral hemorrhage.
- Subarachnoid hemorrhage.

a) Intercerebral hemorrhage
This is the most common type of hemorrhagic stroke which occurs when an artery in brain bursts flooding the surrounding tissue with blood.

b) Subarachnoid hemorrhage
This is the less common type of hemorrhagic stroke caused when bleeding occurs in brain and thin tissues that cover it.

3) TRANSIENT ISCHAEMIC STROKE
It is also called "mini stroke". It is caused due to blood flow to brain is blocked for only a short time is a warning synptom of stroke.

Transient Ischemic Attack
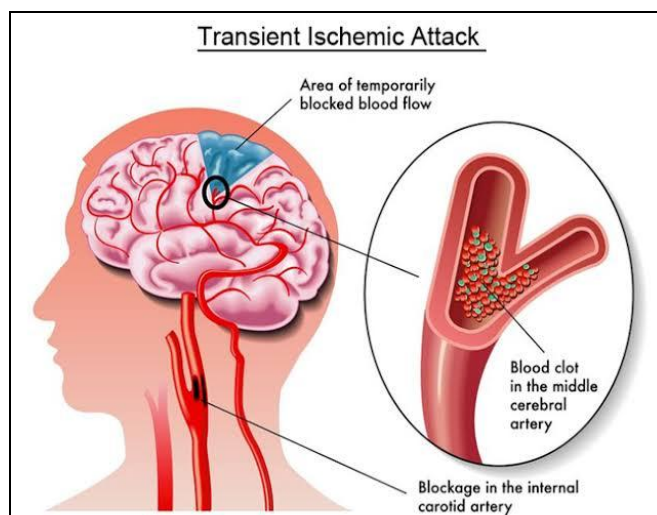
SYMPTOMS
- Slurred speech
- Numbness or weakness of face and upper and lower limbs.
- Blurred or blackened vision
- Severe headache
- Dizziness and vomiting
- Altered consciousness
- Difficulty walking

DIAGNOSIS
- Physical examination.
- Blood tests.

Abnormal elevation of D-dimer levels is an important indicator of disseminated intravascular clotting. It may associate with risk of ischameic stroke but not hemmorhagic stroke. Evidence suggests that no risk of stroke with dose dependent D-dimer level.

- **CT scan**

To create a detailed image of your brain. A CT scan will provide a detailed and clear picture of your brain that shows any bleeding or damage in the brain.[9]

- **MRI**

Powerful radio waves and magnets are used to provide a detailed image of the brain, diagnose brain injury, and identify cerebral bleeding.[10]

- **Carotid ultrasound**

Sound waves create detailed images of inside carotid arteries in the neck.
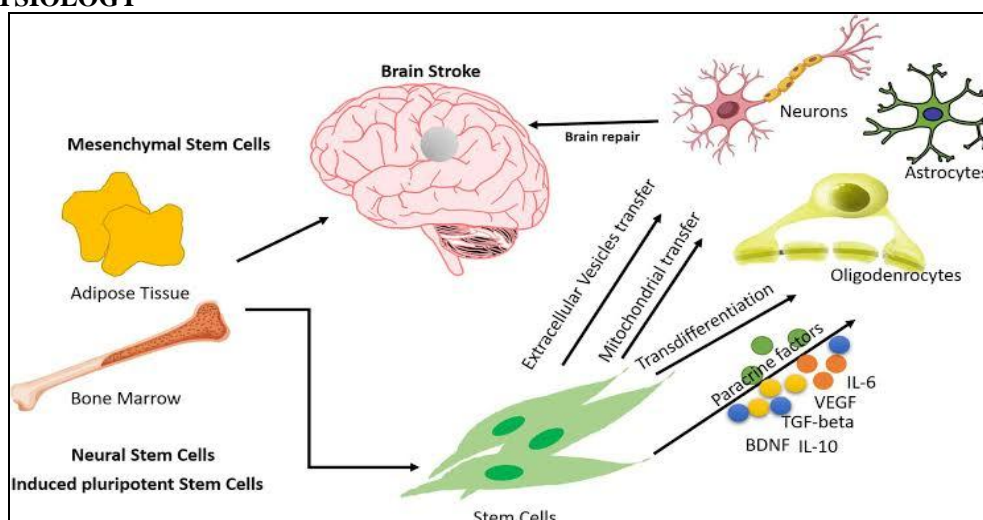
- **Cerebral angiogram**

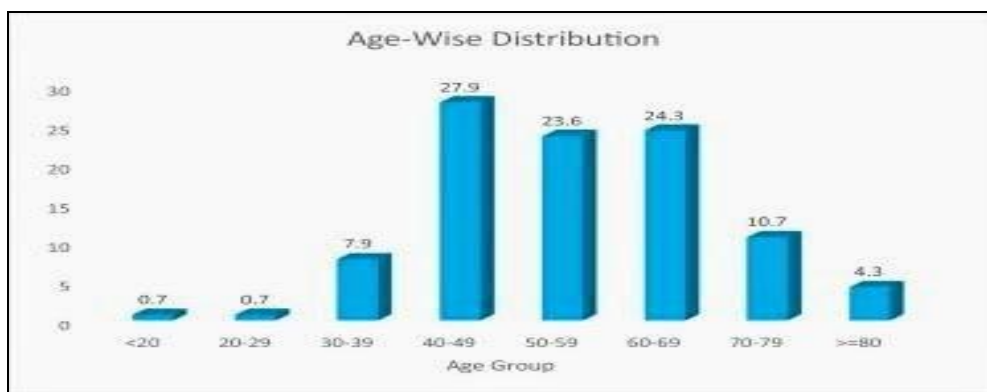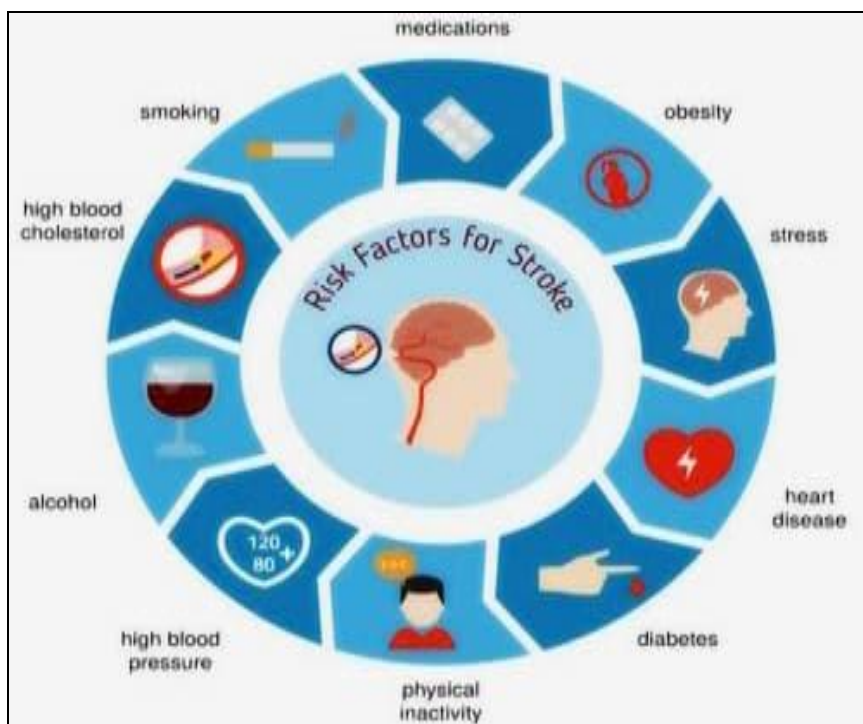Small incision in the groin and guides it through your major arteries.

- **ECHO**

Create detailed images of the heart & clots in it.

PATHOPHYSIOLOGY[11]

RISK FACTORS
- Age[15]

- Hypertension is defined as blood pressure that is more than 140/100 mm Hg.
- Diabetes - up to 400mg/dl.
- Hypercholesterolemia – up to 300mg/dl.

- D-dimer – up to >600 mcg/ml.
- COVID vaccination – due to elevation of D-dimer and blood platelets decreased, low immunity.
- Homocysteine levels – genetics up to <60mmol/lt.

Overall comparison of risk factors with type of stroke

Risk Factor	Ischemic Stroke		Hemorrhagic Stroke		Odds Confidence		
	N[++]	%	N[++]	%	Ratio	Interval	P[+]
Age:<44	20	86	12	15			
44-65	86	36	34	42.5	**1.55**	**0.89-2.68**	**0.12**
>65	130	53.8	34	42.5	**2.29**	**1.02-5.15**	**0.044**
Gender: Female	107	43.9	47	56.6	**0.6**	**0.36-1.02**	**0.06**
Male	137	56.1	36	43.4			
Hypertension	135	67.6	48	57.8	**1.50**	**0.90-2.51**	**0.12**
Previous stroke	73	29.8	21	25.3	**1.25**	**2.21**	**0.43**
Diabetes mellitus	76	31.1	9	10.89	**3.70**	**1.76-7.77**	**<0.01**
Family history	56	22.9	20	24.1	**0.93**	**0.52-1.67**	**0.82**

MANAGEMENT

1. Carotid endarterectomy
The surgery removes clots or plaques near carotid arteries.

2. Angioplasty
It is minor surgery, A catheter is threaded through groin artery to your carotid arteris to expand narrow artery.

4. Conservative therapy
Anti hypertensive drugs :
This table provides efficacy antihypertensive of drug along with classification,

Class of Drug	Drug	Efficacy
ACE inhibitor	Perindopril, Ramipril	Effective
Diuretic	Indapamide	Effective
ARB	Losartan	Effective
	Telmisartan	Possibly Effective
Calcium channel blocker	Amlodipine	Effective
Beta-Blocker	Atenolol	Not Effective

- Antiplatelets -clopidogrel 325 mg.
- Anti coagulants – Aspirin 75 mg. And warfarin and inj. heparin.
- Clot breaking drugs – Alteplase delivered on 3-4.5 hrs.
- If patient was hypertensive – anti hypertensive drugs are used.

If patients was diabetic -prefer insulin.

CONCLUSION
This review concludes that the stroke is mainly caused due to blood clotting and low platelet levels, high risks of diabetic and hypertension patients. Nowadays, 19 COVID patients and vaccinated persons are at high risk and choose conservative therapy; females are at higher risk to low immunity and may get ischaemic stroke then hemorrhagic Stroke. homocysteine also plays a role on stroke. Effective Management of stroke with medication. The relationship between a risk factor and the chance of having a stroke.

REFERENCES
1. Elena Spronk et. al., Transformation in Ischemic Stroke and the Role of Inflammationl, frontiers in neurology, 2021; 12(4): 111-127. https://doi.org/10.3389/fneur.2021.661955.
2. Hugh S Markus et.,al Ischaemic stroke can follow COVID-19 vaccination but is much more common with COVID-19 infection itself, journal of neurosurgery, neruology & psychiatry, 2021; 92(11): 1142. http://dx.doi.org/10.1136/jnnp-2021-327057
3. Laura k. Stein et.,al The new link between COVID-19 and acute stroke, Elisiver science direct, 2021; 44(27): 527-537.
2. Peter berlit et.,al COVID-19 vaccine-associated cerebral venous thrombosis in Germany: a descriptive study:cold spring Harbor journal, BMJ, 2021; 20(5): 320-338., https://doi.org/10.1101/2021.04.30.21256383.
3. Liao et.,al Impact of Diabetes on Stroke Risk and outcomes two Nationwide Retrospective Cohort studies Medicine journal, 2015; 94(52): e2282. doi:10.1097/MD.0000000000002282.
4. 6.wolfe et.,al Diabetes is an independent risk factor for Ischaemic stroke,kurger journal of neuroepidemology, 2022; 55(2): 427-435. https://doi.org/10.1016/j.tins.2021.03.005.
5. A mayman et.,al the emerging association between covid -19 and acute ischemic stroke, elisiver journal of neurnoal sciences, 2021; 44(7): 527-537.
6. Martina patone et.,al complications after first dose of COVID-19 vaccines and SARS-CoV-2 infection: Nature medicine, 2021; 27(6): 2144-2153. https://doi.org/10.1038/s41591-021-01556-7.
7. Robert hurford et.,al Diagnosis and management of acute ischemic stroke :pratical neurology, 2020; 20(4): 306-318. http://dx.doi.org/10.1136/practneurol-2020-002557.
8. El-koussy et.,al imaging of acute ischemic stroke, modalities of MRI and CT, 2014; 72(08): 309-316.
9. Diji kuriakose et.,al Pathophysiology and Treatment of Stroke: Present Status and Future Perspectives: Diji Kuriakose Zhicheng Xiao Internal journal of molecular sciences, 2020; 21(20): 7609-7616. https://doi.org/10.3390/ijms21207609.
10. Alfonso cerase et.,al Temporary emergency guidance to US stroke centers during the coronavirus disease 2019 (COVID-19) pandemic, AHA/ASA journal, 2020; 51(6): 1910-1912.
11. Bruse CV Campbell et.,al, stroke, Thelancet, 2020; 396(10244): 129-242. https://doi.org/10.1016/S0140-6736(20)31179-X.
12. Maria prelipcean, Diabetes and Other Risk Factors for Stroke: Health Line Journal, 2019, https://www.healthline.com/health/diabetes/diabetes-and-stroke.

3. Surgical clipping
A tiny clamp at base of aneurysm to stop blood flow.

13. Ginenus Fekadu et.,al Risk factors, clinical manifestations, and predictors of stroke in adult patients admitted to Jimma University's stroke unit medical center, south west Ethiopia: prospective observational study, BMCneurology, 2019; 187(19): 1-11. https://doi.org/10.1186/s12883-019-1409.

14. Micheal Trillanes et.,al Management of Blood Pressure During and After Acute Ischemic Stroke Recanalization Therapy, frontiers in neurology Neurocritical and Neurohospitalist Care, 2019; 10(158). https://doi.org/10.3389/fneur.2019.00138.

15. Li, Rui -cen, Xu et.,al The risk of stroke and associated risk factors in a health examinationpopulation A cross-sectional study journal of medicine, 2019; 98(40): e1721. doi:10.1097/MD.0000000000017218.

16. Frederic Dierick, Melanie Dehad et.,al Hemorrhagic versus ischemic stroke, who can best benefit from blended conventional physiotherapy with robotic - assisted gait therapy? Frédéric Dierick, Mélanie Dehas, Jean-LucIsambert, Plosone, 2017; 12(6): e0178636. doi:10.1371/journal.pone.0178636.

17. Halder S, Saha BK et.,al Reasearch of stroke patients in terms of clinical and demographic characteristics and outcome, international journal research Medsciences, 2016; 4(9): 4061-4066. http://dx.doi.org/10.18203/2320-6012.ijrms20162934

18. Manorenj S et.,al A clinical research of 100 patients from a tertiary care facility looked at the prevalence, pattern, risk factors, and prognosis of stroke in women. in South India, IJRMS, 2016; 4(6): 2388-2393. https://dx.doi.org/10.18203/2320-6012.ijrms20161819.

19. Wahlgren et.,al treatment of acute stroke: an update, Journal of Internal Medicine, 2015; 278(2): 145-165. doi:10.1111/joim.12387.

20. Thomas Hellen et .,al cause of stroke recurrence is multifactorial patterns, Risk Factors, and Outcomes of Stroke Recurrence, AHA journals, 2003; 34(4):1457-1463. https://doi.org/10.1161/01.STR.0000072985.24967.7F.

21. mechanism of hypertension stroke and hypertension related stroke:A textbook of clincial hypertension and vascular disease pathology andmanagement, by Robert F.SPetzler, 63-77.

22. Ischaemic stroke and vascular insufficiency: Neurovascular surgery by Robert F spetzler, M yadgar, S kalyani, Peter Nakaji, 2nd edition, 203-214.

23. Computer tomography in hemorrhagic and ischemic stroke: A textbook of hemorrhage and ischemic stroke medical, imaging, surgical, interventional approaches by Bernard R.bendok, Andrew M. Naidech, Matthew T.walker, H.hunt Bajer, 53-70.

24. Diji kuriakos et.,al Pathophysiology and Treatment of Stroke: Present Status and Future Perspectives, Internal journal of molecular sciences, 2020; 21(20): 7609-7616.

25. Rosangela Gilibert et.,al Diagnosis and pathophysiology of stroke as complex trait, American journal of hypertension, 2000; 13(10): 1139-1148. https://doi.org/10.1016/S0895-7061(00)01249-8.

26. Maria del Carmen et.,al A Diabetic Stroke Review, stroke research and methodology, 2012, Article ID673187, https://doi.org/10.1155/2012/673187.

27. Abu Nayeem et.,al Modifiable and Non-Modifiable Risk Factors of Stroke: A Review Update, journal of national institute of neuronal sciences Bangladesh, 01(1): 22-28.