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Case Study

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ORAL CONTRACEPTIVE INDUCED YOUNG STROKE: A CASE REPORT

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ABSTRACT

Background: Oral Contraceptive Pill (OCP) composition, smoking, age, hypertension, and the presence of migraine with aura are some confounding variables affecting stroke risk in OCP users. The cluster of stroke risk elements must be considered in conjunction with the Oral Contraceptive Pill formulation to evaluate individual stroke risk. **Case Report:** Here we report a case of a 34-year-old female who was hospitalized with symptoms of right-side facial deviation and left upper-limb weakness. The young patient was using a low-dose combination oral contraceptive pill and had just experienced a stroke. A brain MRI finding was suggestive of a right MCA infarct. She was a known case of polycystic ovarian syndrome and had experienced irregular menstruation for the past five years. She did not smoke, did not have hypertension, and had never before experienced a throbbing headache. **Conclusion:** Even though the connection between oral contraceptives and young stroke is still unclear, it is important to take them into account as a potential cause of stroke in young women. Additionally, there is evidence to support a hereditary predisposition to a stroke brought on by oral contraceptives.

KEYWORDS: Oral Contraceptives, Young Stroke, Young Age Women, Estrogen, Case Report.

INTRODUCTION

Stroke is a major cause of disability and death worldwide, and is classically defined as a neurological deficit attributed to an acute focal injury of the central nervous system (CNS) by a vascular cause, including cerebral infarction, intracerebral haemorrhage (ICH), and subarachnoid haemorrhage (SAH).[1]

Despite significant breakthroughs in primary prevention, diagnostic work, and rehabilitation, stroke still ranks third on the list of causes of death, and predictions indicate that this will be the situation in the coming years.[2]

Most strokes happen to people over the age of 65, while those that occur in adults between the ages of 18 and 65 are known as young strokes. In general, ischemic strokes report 80%-85% of strokes, while hemorrhagic strokes generally report 15% to 20% of strokes. Hemorrhagic strokes were more common in young people, nevertheless. While published studies imply that stroke is uncommon in young people, yet we regularly see acute neurological symptoms in this age range in clinical practice, and stroke should be considered a differential diagnosis. Younger person develops strokes for different reasons than elderly people, and these variations influence diagnosis, evaluation, and therapy; therefore, extrapolating findings from older patient studies to young individuals is not always feasible. Pregnancy, puerperium, hereditary factors, migraines, substance addiction, and foramen ovale are all common causes or risk factors in young stroke patients. Stroke in young individuals has a higher economic impact than stroke in elderly people since it disables patients during their most productive years. Data demonstrating an increased incidence of stroke in younger age groups is concerning.[3] The first meta-analysis of ischemic stroke risk in high-dose estrogen-containing OCP users looked at 16 papers from 1960 to 1999 and revealed a 2.75 (95 percent confidence range, 2.24–3.38) higher relative risk of stroke across estrogen dosage, blood pressure, smoking status, and age.[4]

One established risk element for young stroke in women is the use of oral contraceptive pills (OCP). The young stroke that subsequently developed was exceedingly unusual. This case report presents an uncommon chronic stroke consequence. According to research conducted in

India, 10 to 15 percent of strokes affect adults under the age of 40. The average age of stroke sufferers is thought to be 15 years younger in emerging nations than in developed nations. Nearly one-fifth of the world's patients admitted to hospitals with their first-ever strokes are 40 years old.[5]

OCPs are associated with higher levels of procoagulant components such as fibrinogen, prothrombin, and factors VII and VIII as well as reduced concentrations of antithrombin and tissue factor pathway inhibitor. Additionally, OCP users usually acquire an activated protein C resistance.[6] OCPs with high doses of estrogen were linked to an increase in ischemic stroke in studies conducted in the 1970s, even though such preparations are no longer in use. There have been numerous meta-analyses including case-control & cohort studies that have looked at the relationship between stroke with the low-dose estrogen-progestin OCPs now available.[7]

While prolonged use of hormonal medications, such as oral contraceptives, is known to raise the risk of stroke, it is rarely reported that cerebral infarction can develop after emergency contraception. There have been only two case reports about stroke after post-coital contraceptive agents.[8]

CASE REPORT

A 34-year-old female was hospitalized with symptoms of right-side facial deviation and left upper-limb weakness. She was unconscious for an hour and had been suffering from a severe headache for the previous 12 hours. The patient had been suffering from irregular menstruation for the last 5 years and was a recognized instance of the polycystic ovarian syndrome. She was using Estradiol (0.45 mg), Progestin Norethindrone (3 mg), Mefenamic acid (500 mg), and Myo inositol (600 mg) as an oral contraceptive. The patient was awake and aware, with a pulse of 78 bpm, blood pressure at 110/80 mmHg, as well an oxygen saturation of 98% at room air. GCS (Glasgow Coma Scale) shows E4 V5 M6. The pupil was anisocoric and light-reactive.

Her local examination reveals hypotonia and a 0/5 upper limb power. The right MCA (Middle Cerebral Artery) infarct is seen on an MRI brain scan. Hemoglobin 11.9 g/dL, PT 14.5/14.7, a-PTT 30.3/28.8, Total cholesterol 206, Triglycerides 208, HDL 63, LDL 101, and VLDL 42 were all found to be high in the lab. Her clotting time is 4 minutes and she bleeds for 2 minutes.

She was sent to a multidisciplinary ICU and thrombolysis with a 5 mg bolus injection of Alteplase, followed by 45 mg intravenously over 1 hour was done. After thrombolysis, the patient was transferred to the cardiac unit, where the stroke protocol was followed. The patient was given a mixture of thiamine hydrochloride, riboflavin, cyanocobalamin, D panthenol 1 ampoule in 100 ml NS once a day, Aspirin 150 mg OD, T. Folic Acid 5 mg tid, T. Atorvastatin 40 mg OD, and Inj. Pan 40 mg OD. Power in the upper limb was 5/5 after 24 hours. After that, the patient appears to be in better shape. The patient was kept under surveillance for 5 days and discharged on the 6th day, following the same regimen.

DISCUSSION

Stroke is the 4th prominent source of disease and the 3rd prominent source of mortality globally. Pregnancy, postpartum, dehydration, oral contraceptives, hematological disorders (disorders of the coagulation system, sickle cell anemia, prothrombotic disorders, etc.), Bechet's illness, and other prothrombic states are the leading causes of stroke in young women. Among all the aetiologies indicated above, oral contraceptive usage by females has been linked to ischemic stroke in the female population. Oral contraceptives containing estrogen have been linked to the high possibility of thrombus development. In several studies, oral contraceptives are linked to elevating the uncertainty of acute myocardial infarction and hemorrhagic stroke.[9,10]

For the past year, our patient has been taking oral contraceptives for the polycystic ovarian syndrome. Her two most often used drugs are ethyl estradiol and drospirenone. OCPs are associated with higher levels of procoagulant substances such as fibrinogen, prothrombin, and factors VII and VIII as well as reduced concentrations of antithrombin and tissue factor pathway inhibitor. Our patient complained of facial deviation and weakness in her left upper limb. In the patient's MRI, a severe right side infract was discovered. She was given a tissue plasminogen activator right away and was treated according to stroke protocol. The patient was able to restore consciousness thanks to prompt thrombolysis treatment.

Young individuals account for 10-15% of all stroke patients, rendering them handicapped before they reach their prime working years. In underdeveloped nations, young stroke is more common. This is because particular aetiologies are more widespread in industrialized nations, and the illness load is exacerbated by the affliction of economically active populations.

There is evidence suggesting genetic vulnerability to oral contraceptive-associated stroke, in addition to the mechanism driving the risk of oral contraceptive-associated venous thromboembolism discussed above. The factor V Leiden and methylenetetrahydrofolate reductase C677T alleles are present in the majority of vulnerable females.[11] If the angiotensin-converting enzyme & the angiotensinogen gene are polymorphic, women who use oral contraceptives may have an increased risk of stroke.[12] Stroke incidence for women of childbearing age is 11 per 100,000, but during pregnancy, this risk may rise to 34 per 100,000 as a result of body estrogen levels. According to research, the length of combined oral contraceptive (COC) use may potentially have an impact on stroke risk. An earlier study found that in their meta-analysis of six cohorts and

twelve case-controlled studies the likelihood of an ischemic stroke will rise, it was determined as COC is used over longer periods. As a result, the estrogen adverse impact profile might change based on the method of administration, daily dose, and chemical structure, as well as the category of progesterone medications that come together.[13]

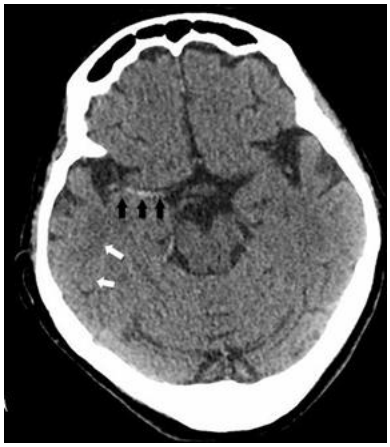

Fig 1 [14]

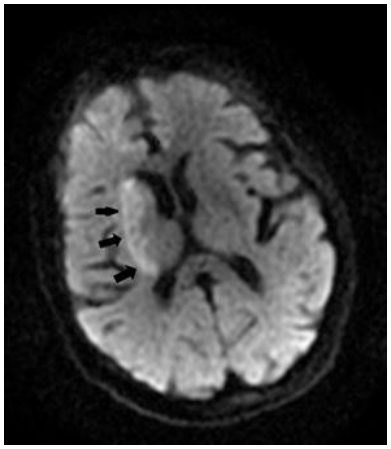

Fig 2 [14]

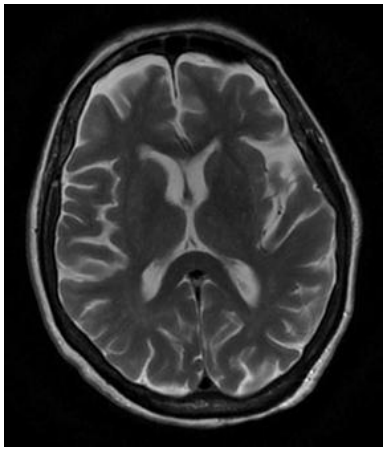

Fig 3 [14]

A similar case was presented by Unnikrishnan et al. where they present a case of MCA infarction associated with stroke. A CT scan of her brain indicated that the gray-white MCA differentiation is in the M1 portion of the middle cerebral artery (MCA) (figure 1). The patient's first National Institutes of Health Stroke Scale score was 17, and she was administered a tissue plasminogen activator (TPA) right away. Nonetheless, she declined the endovascular procedure, and her post-TPA score was similarly 17 since she had shown no signals of progress. She underwent a brain MRI, and the results revealed right basal ganglia diffusion limitation (figure 2), which is consistent with an acute infarct.[14]

CONCLUSION

Though oral contraceptives are one of the most effective types of birth control, there is still worry regarding the short- and long-term hazards connected with them. When a patient displays nonspecific clinical symptoms such as a right-sided facial deviation and weakness in the left upper limb, there should always be clinical suspicion of a possible young stroke. There is evidence to support a hereditary predisposition to a stroke brought on by oral contraceptives. Additionally, women who have a history of cardiovascular illness, especially stroke, should avoid using hormonal contraception that contains estrogen. Hormonal contraceptives that are exclusively progestin-based can be used in the stroke setting. It is advised to use products with the least amount of estrogen. Women should follow doctor's orders when using OCP, which is known to increase the risk of young stroke.

Abbreviations: OCP (Oral Contraceptive Pills), MRI (Magnetic Resonance Imaging), MCA (Middle Cerebral Artery), HDL (High-Density Lipoproteins,) LDL (Low-Density Lipoproteins), VLDL (Very Low-Density Lipoproteins), PT (Prothrombin Time), PTT (Partial Prothrombin Time), ICU (Intensive Care Unit), RBC (Red Blood Cells), COC (Combined Oral Contraceptives), CT (Computed Tomography), TPA (Tissue Plasminogen Activator), GCS (Glasgow Coma Scale), CNS (Central Nervous System), ICH (Intracerebral Haemorrhage), SAH (Subarachnoid Haemorrhage).

Conflict of interest: All authors declare that they have no conflict of interest.

Statement of Ethics: Written informed consent was obtained from the patient.

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