



RECURRENT ISCHEMIC STROKE IN A YOUNG WOMAN WITH NON-ADHERENCE TO SECONDARY PREVENTION: A CASE REPORT

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ABSTRACT

Recurrent ischemic stroke at a young age is a relatively rare condition but carries a high risk of long-term disability. This case report aimed to describe the clinical presentation, management, and outcomes of recurrent ischemic stroke in a young woman with non-adherence to secondary prevention. A case report approach was used to describe the patient's clinical condition, assessment, interventions, and outcomes during hospitalization. Clinical data were obtained from direct patient assessment, medical records, and observations throughout the five-day hospitalization. A 27-year-old woman with a third episode of recurrent ischemic stroke presented with left hemiparesis after discontinuing treatment and routine follow-up for seven months. Neurological examination revealed muscle strength of 3/5 in the left upper and lower extremities, with paresthesia and headache. Her blood pressure on admission was 146/105 mmHg. A head CT scan demonstrated an acute ischemic infarction in the right basal ganglia. The assessment identified non-adherence to secondary prevention as a contributing factor to stroke recurrence. Management focused on stabilizing the acute phase and providing comprehensive secondary prevention education to the patient and family. After five days of treatment, muscle strength improved from 3/5 to 4/5, headache decreased, blood pressure decreased to 130/86 mmHg, and active range of motion in the left extremities improved. The patient and family also demonstrated improved understanding of and commitment to secondary prevention following discharge. This case underscores the importance of structured education, family involvement, and discharge planning in supporting adherence to secondary prevention and reducing the risk of recurrent ischemic stroke.

Keywords: nonadherence; recurrent ischemic stroke; secondary prevention; young women

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INTRODUCTION

Stroke is one of the leading causes of death and disability worldwide. Clinically, stroke is defined as an acute neurological dysfunction resulting from a cerebral vascular event, whether due to a blockage or bleeding (Mao et al., 2024). Among the various subtypes of stroke, ischemic stroke is the most prevalent, accounting for approximately 70–80% of all stroke cases globally (Venketasubramanian, 2025). This condition results from interruption of blood flow to brain tissue, typically due to thrombosis or embolism, leading to ischemia and brain tissue damage (Majumder, 2024).

One of the key clinical challenges for stroke survivors is the risk of recurrent stroke. Although advances in acute-phase therapy and secondary prevention strategies have contributed to a reduction in mortality, patients who survive a first stroke still face a significant risk of recurrence. Globally, studies have shown that approximately 4.26% of stroke survivors experience a recurrent stroke each year, with about 0.77% being fatal and 2.92% non-fatal. Furthermore, in the first year following a stroke, recurrence rates have been reported to range from 5.7% to 17.7% across various populations in several countries, such as China, South Korea, Japan, and Spain (Taweephoh et al., 2024). These findings indicate that recurrent stroke remains a clinical problem with a moderate to high incidence rate and is associated with worse outcomes compared to a first stroke.

In addition to occurring in older adults, there has been a trend in recent decades toward an increase in stroke incidence among younger age groups. Stroke in young adults, generally defined as those aged 15–49 years, is reported to account for approximately 10–15% of all stroke cases (Tan et al., 2025). This increase is believed to be associated with changes in modern lifestyles, such as the rising prevalence of obesity, lack of physical activity, unhealthy diets, and an increase in cardiovascular risk factors, including hypertension, diabetes mellitus, and dyslipidemia at younger ages. This condition is a cause for concern because it occurs during the productive years and has the potential to cause long-term impacts on quality of life, economic productivity, and social and family burdens (Hussain et al., 2021). In addition, a stroke at a young age often leads to long-term disability, given the long life expectancy following the first stroke.

Within this young population, women constitute a subgroup with clinical characteristics and risk factor profiles that differ from those of men. Risk factors specific to women, such as exposure to exogenous hormones, use of hormonal contraceptives, and conditions related to pregnancy and the postpartum period, are known to contribute to an increased risk of stroke. Pregnancy complications such as preeclampsia and gestational diabetes also play a role through mechanisms involving endothelial dysfunction, hypertension, and a hypercoagulable state. In addition, modifiable risk factors such as hypertension, obesity, smoking, and type 2 diabetes are reported to have a stronger association with stroke incidence in women than in men. Research also shows that the incidence of ischemic stroke in women aged ≤ 35 years is higher than in men in the same age group (Leppert et al., 2022; Schwarzwald et al., 2022; Carcel et al., 2024).

These various factors not only increase the risk of a first stroke but also contribute to recurrent strokes in young women. Recurrent stroke is multifactorial in nature, involving non-modifiable factors such as age, sex, ethnicity, and family history, as well as modifiable factors such as hypertension, diabetes mellitus, heart disease, dyslipidemia, obesity, peripheral artery disease, hypercoagulable states, and an unhealthy lifestyle. In addition, factors such as non-adherence to treatment, depression, memory impairment, stroke severity, and a lack of education upon discharge also play a role in increasing the risk of recurrence (Nindrea, 2023; Araya, 2023; Zhuo, 2020).

However, reports on recurrent ischemic stroke in young women, particularly those related to adherence to secondary prevention, remain relatively limited, especially in cases involving multiple recurrences before the age of 30. This case has significant clinical importance because the patient experienced three episodes of ischemic stroke during her productive years, with an increasing degree of neurological deficit between attacks. This condition underscores that stroke at a young age does not always have a favorable prognosis and can lead to long-term disability if underlying risk factors are not optimally controlled. In this context, secondary prevention is a critical component of long-term management for post-stroke patients. However, the success of secondary prevention is often linked to adherence to therapy, control of vascular risk factors, lifestyle modifications, and ongoing medical follow-up. Non-adherence to these aspects can lead to uncontrolled vascular risk factors and increase the risk of stroke recurrence (Wang et al., 2026; Stollberg et al., 2026).

Given this background, the combination of recurrent ischemic stroke in women of childbearing age and non-adherence to secondary prevention makes this case clinically and educationally significant and worth reporting. Therefore, this case report aims to describe the management of recurrent ischemic stroke in a young woman with a history of previous stroke as well as to highlight the crucial role of adherence to secondary prevention in preventing recurrence. It is hoped that this case report will contribute to clinical understanding and serve as a learning opportunity in efforts to improve the quality of management and secondary prevention of ischemic stroke in young women.

METHOD

This case report describes the management of recurrent ischemic stroke in a young woman with a history of poor adherence to secondary prevention. The patient was a young woman with a third episode of ischemic stroke who was hospitalized in a neurology ward at a hospital in Garut Regency, Indonesia. Data were obtained from direct observation, patient and family interviews, physical examination, and medical records, including relevant diagnostic investigations, during hospitalization from October 30 to November 3, 2025. Written informed consent was obtained from the patient after receiving information regarding the purpose and procedures of the case report. Clinical outcomes were assessed daily using the Glasgow Coma Scale, mean arterial pressure, Numeric Rating Scale for headache intensity, manual muscle testing, and active range of motion for left shoulder and hip flexion. Clinical data were analyzed descriptively and presented according to the patient's clinical progression during hospitalization.

RESULT

A 27-year-old woman presented with left-sided weakness. Three days before admission, she developed a sudden, severe headache described as the worst headache of her life, accompanied by repeated vomiting. Shortly thereafter, she lost consciousness while in the bathroom at home and was taken to a nearby community health center, where she remained unconscious for approximately two hours. After regaining consciousness, the patient continued to complain of weakness in the left arm and leg. The patient underwent observation and initial treatment at the community health center before being discharged while conscious, though still experiencing weakness in the left limbs. Because the symptoms persisted, the patient was then taken to the hospital on October 27, 2025, for further management.

This episode marks the patient's third ischemic stroke. The first stroke occurred at age 25, presenting with mild symptoms of headache and weakness in the left limbs, without speech impairment. The first stroke left no residual neurological deficits. The second stroke occurred at age 26 while the patient was working at a garment factory, characterized by a sudden loss of consciousness accompanied by confusion and memory impairment lasting 1 day. During the second stroke, weakness on the left side of the body recurred but was more severe, requiring the patient to use a walking aid. In the current episode, the patient again experienced neurological deficits on the same side of the body in the form of left hemiparesis. The clinical manifestations in all three stroke episodes involved the same side of the body, with a more severe degree of neurological deficit compared to the first episode. CT scan results for all three episodes showed involvement of the same lesion site, namely the right hemisphere, and the CT scan for the current episode revealed an acute ischemic infarction in the right basal ganglia.

Following the second stroke, the patient experienced limited mobility, requiring a walking aid, and no longer worked at the factory but instead ran a small business from home. For approximately seven months before the current stroke, the patient stopped routine follow-up visits and stopped taking prescribed medications because he felt his condition had improved. The patient also did not follow the recommended dietary guidelines and continued to consume foods high in fat and salt, as well as drinking coffee regularly every morning. The patient had several vascular risk factors, including chronic hypertension for about nine years with suboptimal blood pressure control, dyslipidemia, obesity, and a history of preeclampsia during a pregnancy in 2016, which occurred six years before the first stroke. The family history revealed a stroke in the patient's biological mother. There was no history of long-term hormonal contraceptive use or use of other medications known to be associated with an increased risk of thrombosis.

Upon arrival at the emergency department on October 27, 2025, the patient reported weakness in the left limbs that had begun 3 days earlier, accompanied by tingling, vertigo, and a history of vomiting. Initial examination revealed a blood pressure of 110/90 mmHg with neurological findings including

left-sided central facial nerve paresis and a 3/5 reduction in motor strength in the left extremity. Because the patient presented more than 72 hours after symptom onset, acute reperfusion therapy was not indicated. As part of acute stroke management, the patient received periodic monitoring of neurological and hemodynamic status, antiplatelet therapy with 80 mg of aspirin, and supportive therapy with citicoline and mecobalamin.

At the examination on October 30, 2025, in the neurology ward, on the sixth day after the onset of the stroke and the fourth day of hospitalization, the patient's blood pressure was 146/105 mmHg, pulse rate was 89 beats per minute, respiratory rate was 20 breaths per minute, and oxygen saturation was 99% on room air. The patient was fully conscious with a GCS score of 15 (E4V5M6) and no impairment of consciousness. In addition, the patient reported a moderate headache rated 5/10. Neurological examination revealed left-sided hemiparesis with muscle strength of 3/5 in the left upper and lower extremities, accompanied by paresthesia characterized by numbness and tingling. Motor strength in the right upper and lower extremities was normal (5/5). Deep tendon reflexes were present and symmetrical in the left upper and lower extremities. Cranial nerve examination (I–XII) was unremarkable, with no facial asymmetry or dysarthria. Coordination and balance on the right side were good, while on the left side they were limited, consistent with the patient's hemiparesis.

Laboratory tests on October 28, 2025, showed hematological parameters within normal limits, including hemoglobin at 11.4 g/dL, white blood cell count at 9,006/ μ L, red blood cell count at 5.61 million/ μ L, platelet count at 370,000/ μ L, and hematocrit at 39%. The random blood glucose level of 121 mg/dL remained within the normal range. Renal function parameters showed a urea level of 21 mg/dL and a creatinine level of 0.48 mg/dL; in contrast, liver function parameters showed SGOT and SGPT levels of 25 U/L each, both of which remained within normal limits. A lipid profile test on October 30, 2025, showed elevated total cholesterol at 229 mg/dL, LDL at 191 mg/dL, HDL at 44 mg/dL, and triglycerides at 116 mg/dL. Investigations into the etiology of stroke at a young age, such as evaluations of coagulation, thrombophilia, autoimmune diseases, and sources of cardioembolic emboli, were not performed during the course of treatment.

During hospitalization, the patient received pharmacological therapy consisting of citicoline (1 g twice daily), mecobalamin (500 μ g twice daily), and clopidogrel (75 mg once daily). In addition, the patient received nonpharmacological interventions, including regular monitoring of neurological and hemodynamic status, active range-of-motion exercises, progressive mobility training, pain management through pain assessment and positioning, and structured education for the patient and family regarding medication adherence, dietary management, and post-discharge follow-up. The patient's clinical characteristics are summarized in Table 1.

Table 1.
Summary of Patient Clinical Data

Age /Date of Birth	27 years 4 months
Gender	Female
Medical Diagnosis	Recurrent ischemic stroke (third episode)
Chief complaint	Sudden onset of left hemiparesis preceded by severe headache and transient loss of consciousness
Medical history	Hypertension (10 years), previous ischemic stroke (2 episodes), history of preeclampsia
Cardiovascular risk factors	Obesity (BMI 30.2 kg/m ²), dyslipidemia, family history of stroke
Secondary prevention adherence	Discontinued secondary prevention medication and routine follow-up for 7 months
Vital signs	BP 146/105 mmHg, HR 89 bpm, RR 20 breaths/min, SpO ₂ 99% on room air
Neurological findings	GCS 15 (E4V5M6), left hemiparesis with muscle strength of 3/5 in the left upper and lower extremities, paresthesia of the left extremities, intact cranial nerves (I–XII), and no speech impairment
Imaging	Non-contrast brain CT: acute ischemic infarction in the right basal ganglia.
Laboratory findings	Elevated total cholesterol (229 mg/dL) and LDL cholesterol (191 mg/dL); other hematological, renal, liver function, and glucose parameters were within normal limits.

Patient care during hospitalization focuses on stabilization in the acute phase, early rehabilitation, and secondary stroke prevention. Management includes periodic monitoring of neurological and hemodynamic status; administration of clopidogrel; supportive therapies such as citicoline and mecobalamin as indicated; pain management; and gradual active range of motion (AROM) exercises to support recovery of motor function in the left extremity. In addition, patients and their families are educated on the importance of adherence to treatment, routine follow-up, control of vascular risk factors, and lifestyle modifications as part of secondary stroke prevention efforts. The patient's response to therapy showed gradual clinical improvement over five days of treatment. Changes in the patient's condition were continuously monitored by evaluating neurological status, blood pressure, mean arterial pressure, headache intensity, muscle strength, and active range of motion. The patient's complete clinical progress over the five days of treatment is presented in Table 1.

Table 2.
Clinical Progress of Patients During Hospitalization

Day of Care	GCS	Headache	Blood Pressure (MAP)	Upper Extremity Strength	Lower Extremity Strength	AROM Shoulder Flexion	AROM Hip Flexion
Day 1	E4M6V5	5/10	146/105 (119)	(3/5)	(3/5)	60°	30°
Day 2	E4M6V5	5/10	136/91 (106)	(3/5)	(3/5)	60°	30°
Day 3	E4M6V5	5/10	121/94 (103)	(3/5)	(4/5)	60°	45°
Day 4	E4M6V5	3/10	135/81 (99)	(3/5)	(4/5)	90°	45°
Day 5	E4M6V5	2/10	130/86 (101)	(4/5)	(4/5)	90°	45°

At the end of the treatment period, the patient's condition showed clinical improvement with better-controlled hemodynamic status, as indicated by a blood pressure of 130/86 mmHg and a mean arterial pressure (MAP) of 101 mmHg. The neurological status remained stable with no recurrence of impaired consciousness (GCS E4M6V5), and the headache intensity decreased from 5/10 to 2/10. Motor function in the left extremities improved, as indicated by an increase in muscle strength from 3/5 to 4/5 in the left upper and lower extremities, accompanied by an increase in the active range of motion (AROM) for shoulder flexion from 60° to 90° and for hip flexion from 30° to 45°. Nevertheless, the patient still requires an assistive device when walking, indicating the presence of residual physical mobility impairment, which necessitates continued rehabilitation after discharge.

An evaluation of secondary prevention measures revealed an increase in patients' and families' understanding of the importance of adherence to long-term post-stroke therapy. The initial assessment found that patients had only received general advice to take their medication and maintain a healthy diet, without understanding the clinical consequences of non-adherence, which contributed to treatment discontinuation, uncontrolled vascular risk factors, and recurrent strokes. After receiving education during their hospitalization, patients and their families were able to explain the purpose of medication use, the importance of routine check-ups, the management of vascular risk factors, and the lifestyle modifications necessary to prevent recurrence. In addition, patients expressed a commitment to continuing treatment regularly, adhering to dietary recommendations, undergoing periodic check-ups, and participating in follow-up rehabilitation programs with their families serving as their primary support system. As part of discharge planning, the patient was discharged with a plan for outpatient follow-up, a follow-up rehabilitation program, periodic blood pressure monitoring, and family involvement in supporting treatment adherence and monitoring for signs of recurrence.

DISCUSSION

This case illustrates the complexity of recurrent ischemic stroke in young women, a condition that, although relatively rare compared to older age groups, has significant clinical implications because it occurs during childbearing years and has the potential to cause long-term disability. Ischemic stroke in young women has distinct and multidimensional risk factors, involving both general vascular factors and female-specific factors that develop throughout the life cycle. Previous research has shown that factors related to reproductive health, such as pregnancy complications and hormonal

changes, contribute to an increased risk of stroke in young women (Eng et al., 2024). Women with a history of pregnancy-related hypertension, including preeclampsia, face a higher risk of ischemic stroke later in life (Amin et al., 2022; Verburgt et al., 2025; J. Yang et al., 2023).

In this context, this patient exhibited vascular vulnerability from a young age, exacerbated by a combination of non-modifiable and modifiable factors. A history of preeclampsia is an independent risk factor associated with an increased risk of stroke and long-term cardiovascular disease through chronic inflammation and oxidative stress, which contribute to persistent vascular dysfunction (de Havenon et al., 2021; Hallum et al., 2023; C. Yang et al., 2023). This biological vulnerability is further exacerbated by modifiable risk factors, including uncontrolled hypertension, dyslipidemia, obesity, a diet high in fat and salt, lack of physical activity, and prolonged work-related stress and fatigue. These factors consistently predict the incidence and recurrence of ischemic stroke (Alkahtani, 2022; Chung et al., 2023). In these patients, failure to control the above-mentioned modifiable risk factors, in addition to pre-existing biological predispositions, likely contributes to the occurrence of recurrent ischemic stroke.

A history of previous stroke is one of the strongest predictors of recurrent stroke. This is because the first stroke reflects the presence of underlying vascular disease or risk factors that persist even after the acute phase has resolved, leaving patients with a residual risk of subsequent cerebrovascular events (Wang, 2021). Cohort studies show that patients with a history of stroke have a recurrence risk of about 4% within one year, rising to about 13% within ten years after the first stroke (Skajaa et al., 2022). Furthermore, Alraddadi et al. (2025) reported that patients with a history of ischemic stroke have more than a threefold higher risk of recurrent stroke compared to individuals without a prior history of stroke.

In addition to increasing the risk of recurrence, recurrent stroke is also associated with the accumulation of neurological deficits, increased disability, and a poorer long-term prognosis compared to the first stroke (Juli et al., 2022; Skajaa et al., 2021). In the patient described in this report, the clinical course showed an increase in severity between attacks, ranging from an initial episode with mild symptoms and no residual neurological deficits to a subsequent recurrence accompanied by impaired consciousness and persistent hemiparesis. These findings are consistent with a study in a young adult population aged 18–50 years, which showed that patients with recurrent stroke have a higher initial severity and more limited neurological recovery compared to patients with a first stroke (Juli et al., 2022). Furthermore, Kwok et al. (2025) reported a recurrence rate of 3.41% in a young adult population, with a significantly higher risk among patients with a history of previous stroke.

The most notable aspect of this case is the role of non-adherence with secondary prevention as a major factor in the occurrence of recurrent ischemic stroke. Non-adherence with pharmacological therapy is known to significantly increase the risk of recurrence, including with the use of anticoagulants and statins (Yeo et al., 2020). In addition to discontinuing treatment and failing to attend routine follow-up appointments for seven months, the patient also did not implement the recommended lifestyle modifications, as evidenced by limited physical activity and a diet high in fat and salt. These conditions likely contributed to poor control of vascular risk factors, as indicated by the persistence of hypertension and dyslipidemia during treatment. These findings are consistent with studies showing that low physical activity and dietary patterns that do not align with recommendations are associated with an increased risk of recurrent ischemic stroke (Lennon et al., 2021).

Nevertheless, this patient's non-adherence appears to be more related to limited understanding than to refusal of therapy. Based on the interview results, during previous episodes of care, the patient received only general education regarding medication use and dietary management, without an

adequate explanation of the relationship between discontinuation of therapy, failure to control vascular risk factors, and an increased risk of recurrent stroke. These findings indicate a gap in post-stroke health education that could potentially affect long-term adherence and contribute to recurrence.

The management of recurrent ischemic stroke requires a comprehensive medical and nursing approach, encompassing acute-phase management as well as long-term secondary prevention strategies. In younger patients, this approach becomes increasingly important given the high risk of recurrence and long-term mortality (Putala, 2020). The management of ischemic stroke must be carried out systematically, starting with early identification, proper triage, and the administration of evidence-based therapies during the acute and post-acute phases (Phipps & Cronin, 2020; Rodgers et al., 2021). Primary and secondary prevention of ischemic stroke also require multidimensional strategies, including control of vascular risk factors, lifestyle modifications, and appropriate pharmacological therapy (Diener & Hankey, 2020). In this case, acute-phase management focused on close monitoring of neurological status to detect early deterioration, control of headache, positioning the head at a 30-degree elevation to prevent increased intracranial pressure, and administering pharmacological therapy consisting of antiplatelet agents and supportive care in accordance with the ischemic stroke protocol. Comprehensive nursing interventions were implemented, including hemodynamic monitoring, pain management, prevention of immobilization-related complications, and gradual active range-of-motion exercises to support motor function recovery.

In addition to stabilizing the acute phase, nurses also play a crucial role in supporting secondary prevention and long-term recovery in patients with recurrent ischemic stroke. Nursing interventions focus not only on neurological monitoring and the prevention of complications during hospitalization but also on educating patients to recognize the warning signs of recurrent stroke, promoting medication adherence, vascular risk factor management, and lifestyle modification. For patients with limited mobility, nurses also play a key role in preventing immobility-related complications, providing psychological support for stroke-related functional limitations, and coordinating post-discharge rehabilitation programs. This approach aligns with recommendations that high-quality stroke care requires continuous, evidence-based nursing throughout the acute and recovery phases, with an emphasis on secondary prevention, rehabilitation, and continuity of care (Kleindorfer et al., 2021; Tanaka et al., 2023).

During the five-day hospitalization, the patient showed clinical improvement in the form of reduced headache, better-controlled blood pressure, no recurrence of impaired consciousness or neurological deterioration, and an increase in left extremity muscle strength from 3/5 to 4/5, accompanied by an increase in the active range of motion of left shoulder flexion from 60° to 90° and left hip flexion from 30° to 45°. Nevertheless, the patient still required a walking aid upon discharge, indicating the presence of residual neurological deficits and the need for continued rehabilitation. These findings are consistent with reports that patients with ischemic stroke often continue to experience functional limitations despite clinical improvement during the acute phase (Hasan et al., 2021; Herpich & Rincon, 2020). Therefore, discharge planning is a crucial component of nursing care, encompassing the promotion of adherence to therapy, outpatient follow-up schedules, continued rehabilitation programs, management of vascular risk factors, lifestyle modifications, and family involvement in monitoring therapy and the early detection of signs of recurrence.

Overall, this case report highlights the importance of controlling vascular risk factors and implementing secondary prevention strategies in young patients with recurrent ischemic stroke. This case also illustrates the need for patient and family education regarding medication adherence, lifestyle modifications, and post-discharge follow-up care. Limitations of this case report include incomplete documentation of stroke severity assessment, limited evaluation of stroke etiology in young adults, and the absence of long-term follow-up data.

CONCLUSION

This case highlights that recurrent ischemic strokes can occur in young women and have long-term consequences during their productive years. The occurrence of three stroke episodes in this patient emphasizes the necessity of a comprehensive evaluation of the etiology and identification of risk factors, particularly in cases with recurrent episodes. In addition to acute-phase management, secondary prevention through control of vascular risk factors, adherence to medication, lifestyle modifications, and ongoing medical follow-up are crucial components of the long-term management of young stroke patients.

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