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# Recombinant tissue plasminogen activator (rTPA) in young adult patient with acute ischemic stroke: a case report



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## ABSTRACT

**Background:** Stroke is one of the highest causes of morbidity and mortality in the world. The incidence rate of ischemic stroke is about 80% of all stroke incidents. The use of recombinant tissue plasminogen activator (rtPA) is recommended under 4.5 hours of stroke onset. Stroke in young adults are reported as being uncommon, compromising 10% -15% of all stroke patients. Many studies were reported the most common risk factor in young adults were obesity and dyslipidemia. This case report will discuss a 33-year-old men with ischemic stroke with obesity and dyslipidemia treated at dr. Kariadi Hospital Semarang.

**Case presentation:** A 33-year old obese man with left-sided

hemiparesis and central facial nerve palsy with an onset of 1 hour. On laboratory examination, it was obtained total cholesterol 179mg/dL, LDL level 123mg/dL, and HDL level 39mg/dL. The protocol code stroke was performed in emergency room with alteplase (r-TPA) 0.6 mg/kgBW, after his head MSCT shows there was no sign of blood in the brain parenchym.

**Conclusion:** The increased risk of ischemic stroke in young patients is due to dyslipidemia, hypertension, obesity, physical inactivity, and smoking. Treatment of the hyperacute phase of ischemic stroke with thrombolysis can reduce the outcome of stroke due to the disability.

**Keywords:** ischemic stroke, recombinant tissue plasminogen activator (rTPA), young adult stroke

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## INTRODUCTION

Stroke is the leading cause of death and disability worldwide, especially in developing countries, with the increased incidence in young adults. There are 10% to 15% incidents of stroke in young adults with the incidence of ischemic strokes is more frequent than bleeding strokes, around 80-85% of all strokes.<sup>1-6</sup> The most common risk factors of stroke in young adults were dyslipidemia, hypertension, obesity, physical inactivity, and smoking.<sup>1,6-8</sup> The pathophysiology of ischemic stroke involves a complex immunological response starting from a thrombotic or embolic process that causes the death of neuron cells in the brain parenchyma which is called the ischemic cascade. The ischemic cascade consists of glutamate exotoxicity, intracellular calcium overload, free radical toxicity, and inflammation of the brain parenchyma.<sup>9,10</sup> The area of the infarct core is surrounded by potentially salvageable neurones, called the penumbra area.<sup>2,10,11</sup>

Many risk factors are associated with stroke, modifiable and non-modifiable. Modifiable stroke risk factors are hypertension, diabetes mellitus, dyslipidemia, obesity, and many more. The non-modifiable stroke risk factors are relatively few; including genetic, age, and gender.<sup>4,5</sup> Dyslipidemia

is a lipid metabolism disorder, including an increase in cholesterol levels, an increase in LDL level, increased triglyceride levels and a decrease in HDL levels. Dyslipidemia is one of the most important risk factors for cerebrovascular disease because it is associated with atherosclerosis.<sup>12</sup> People with obesity are at risk of stroke because obesity can increase the risk of another cardiovascular risk factor (hypertension, diabetes mellitus, and coronary heart disease).<sup>13,14</sup>

The use of rTPA (recombinant Tissue Plasminogen Activator) is essential when it is given to acute stroke patients with certain conditions, both intravenously or intra-arterial, less than 3 hours after the onset of stroke and as soon as possible (AHA/ASA class I, level of evidence A). Intravenous administration of rTPA in patients in Asia is given with a low dose 0.6 mg/kgBW (maximum 60 mg), 10% of the total dose is given as an initial bolus, and the other is given in an infusion for 60 minutes.<sup>15</sup> The aim of using rTPA is to destruct the thrombus so the reperfusion of brain tissue can be occurred, especially in penumbra area, and the patient clinical outcome will be better.<sup>15,16</sup>

The case report that explains about rTPA in young adult patient with dyslipidemia and obesity are still limited. This case report will discuss about

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