

# Fibrinolytic or Not: Case Series of STEMI

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## **Fibrinolytic or Not: Case Series of STEMI and Deadly Hemorrhagic Stroke**

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### **Abstract**

Cardiovascular diseases (CVD) like myocardial infarction (MI) is still becoming <sup>21</sup> the leading cause of morbidity and mortality and major problem in our healthcare system. Nowadays, revolution in <sup>24</sup> high-tech medical treatment alongside with well-trained staff could decrease adverse event in <sup>24</sup> ST elevation myocardial infarction (STEMI) patient. However, in developing country like Indonesia, <sup>20</sup> those still become a challenge. Fibrinolytic therapy is still common practice even though <sup>20</sup> primary percutaneous coronary intervention (PPCI) preferred. Intracranial bleeding is one of <sup>20</sup> the most unfavorable effect after fibrinolytic therapy. Clinical should aware with clinical deterioration. Here we present case series of deadly intracranial haemorrhage in STEMI patient after fibrinolytic therapy.

### **Abstrak**

Penyakit kardiovaskular seperti infark miokard (MI) masih <sup>19</sup> menjadi penyebab utama morbiditas dan mortalitas dan masalah utama dalam sistem kesehatan kita. Saat ini, revolusi dalam perawatan medis dengan teknologi canggih bersama dengan staf yang terlatih dapat mengurangi efek yang tidak diharapkan <sup>18</sup> pada pasien infark miokard akut dengan ST elevasi (IMASTE). <sup>13</sup> Namun, di negara berkembang seperti Indonesia, hal itu masih menjadi tantangan tersendiri. Terapi fibrinolitik masih umum dilakukan walaupun intervensi koroner perkutan primer (IKPP) lebih disukai. Perdarahan intrakranial adalah salah satu efek yang paling tidak diharapkan setelah terapi fibrinolitik. Klinisi harus sadar dengan perubahan klinis pasien. Kami menyajikan serangkaian kasus perdarahan intrakranial mematikan pada pasien STEMI setelah terapi fibrinolitik.

## Introduction

The mortality rate caused by cardiovascular diseases are increasing. In Indonesia there is significantly rising of cardiovascular mortality's number from 5% in 1975 to 30% in 2004.<sup>1</sup> One of the highest concerns for mortality indicine among cardiologist is Acute Myocardial Infarction (AMI).<sup>2</sup> AMI patient with ST-elevation myocardial infarct (STEMI) needed to undergo reperfusion therapy immediately. Primary Percutaneous Coronary Intervention (PPCI) is the preferred reperfusion in patient with STEMI within 12 hours of symptoms onset, however this procedure is still difficult due lack of skilled support staff, geographic and structural differences in medical system like in Indonesia.<sup>1-3</sup> Data from Jakarta Acute Coronary Syndrome (JAC) Registry data based from 2008 – 2009 shows 654 acute STEMI patient who were admitted to the National Cardiovascular Center Harapan Kita (NCCHK), Jakarta, Indonesia only 29% patients undergo PPCI.<sup>1</sup> Pharmacotherapy, using fibrinolytic therapy especially in early after onset of the symptoms offers a reasonable therapeutic option and has yielded satisfactory clinical result.<sup>2</sup> Fibrinolytic therapy plays an important role in the management of Acute Myocardial Infarction (AMI) to minimize tissue damage and boost survival rates. However, it has a significant risk of bleeding complications, including hemorrhagic stroke.<sup>4,5</sup>

## Case 1

A 65-year-old woman presented to RSUD Pasar Rebo emergency room (ER) because of migrated chest pain from left chest to the left arm for 6 hours. The chest pain was not worsened with rest, she complained of nausea and had a vomit one time. She had a history of controlled hypertension. Physical exam in ER revealed blood pressure (BP) 140/90 mmHg, heart rate (HR) 64 bpm, respiratory rate 20 times per minute and body temperature 36.4°C. A blood test revealed an increase of SGOT and troponin I and a decrease of urea blood. Electrocardiography showed sinus tachycardia with ST-segment elevation in V2 – V6 (Figure 1). Based on examination, there is no contraindication for fibrinolytic therapy. Streptokinase was administrated. After 60 minutes, the chest pain was disappeared and no complained, successful fibrinolytic was achieved (Figure 1 dan 2). Although the patient had paresthesia for 5 minutes during the procedure and patient transferred to the ward.

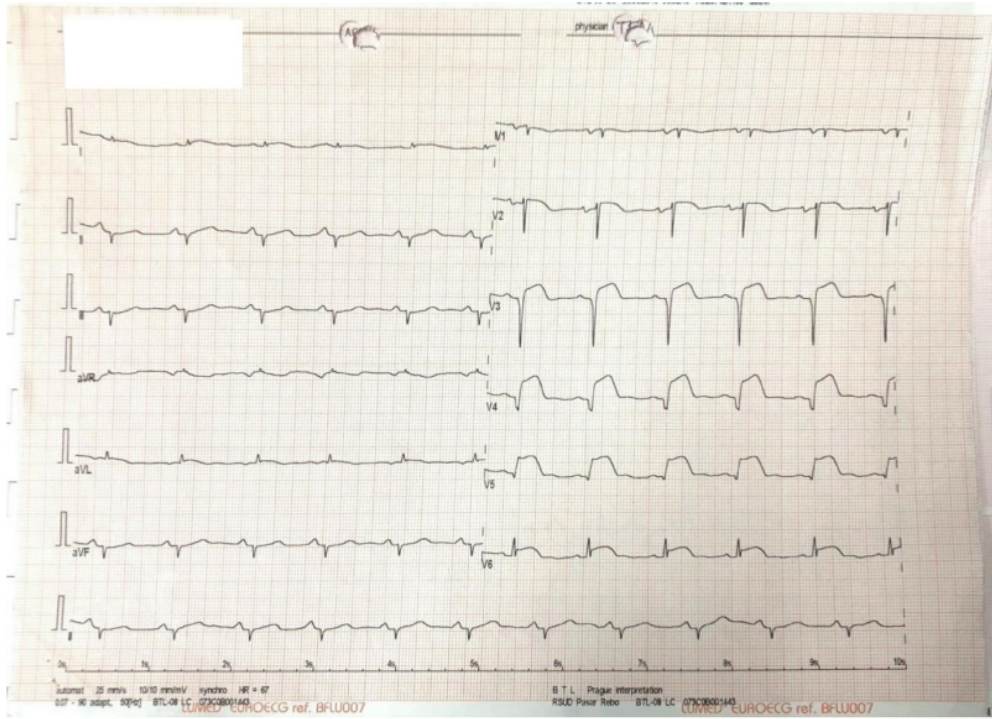


Figure 1. ECG Examination 20-08-2019, 05:32 AM (pre-fibrinolytic)

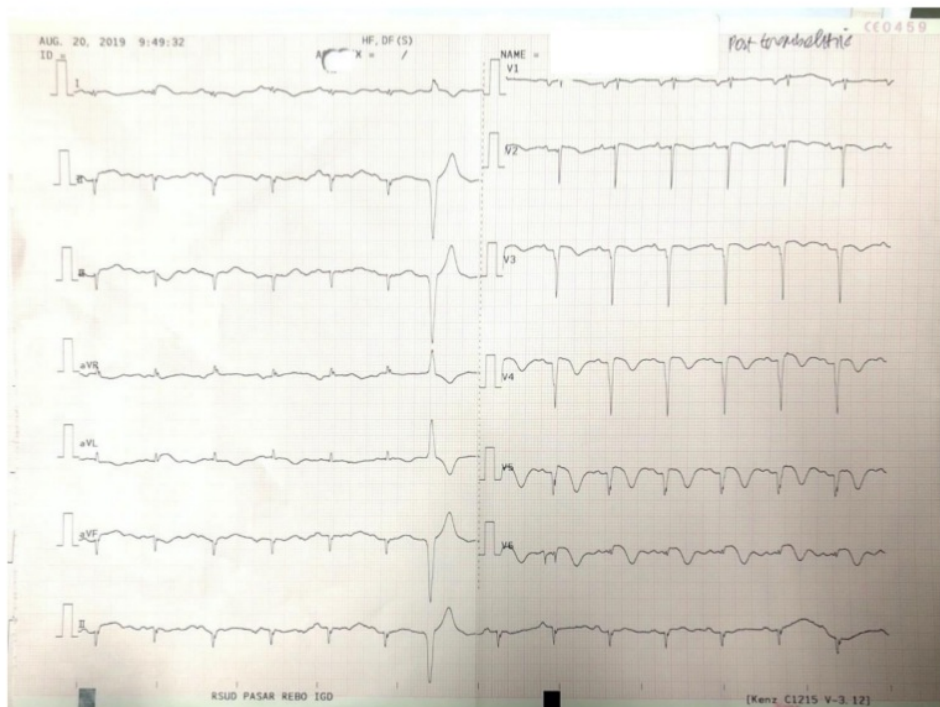


Figure 2. ECG Examination 20-08-2019, 09:49 AM (post-fibrinolytic)

Eight hours later, the left hemiparesis still persists. Dynamic ST-T changes, bigeminy PVC and tachycardia was found (Figure 3-5). CT scan was performed and showed hemorrhagic stroke. After all of the antithrombotic and anticoagulant medication were discontinued, 19 hours and 30 minutes later, the patient had a loss of consciousness and the resuscitation was not performed due to requested Do Not Resuscitate (DNR). The patient died after 30 minutes (Figure 6).

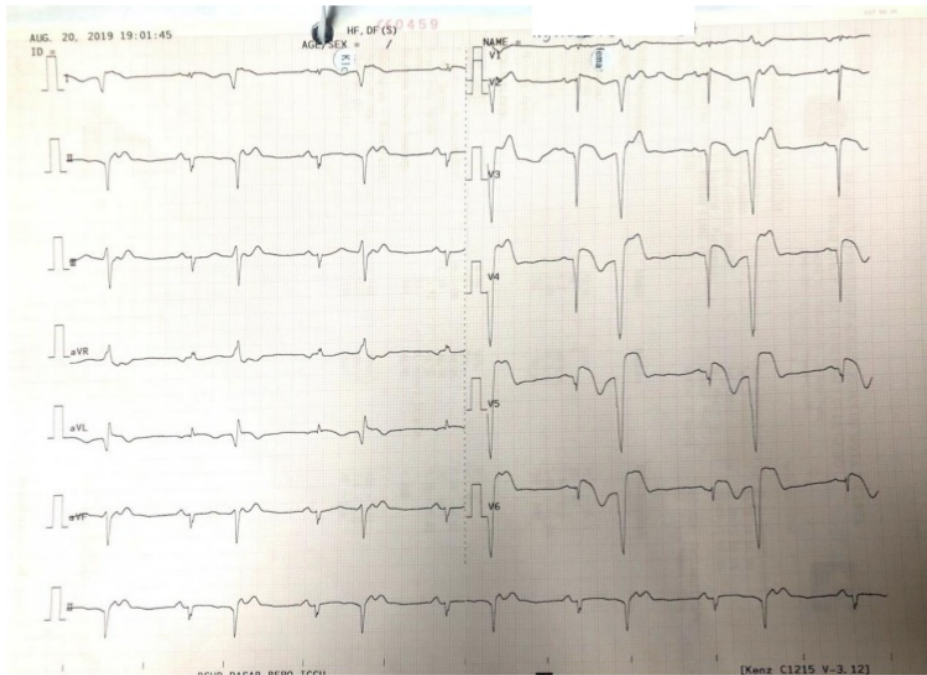


Figure 3. ECG Examination 20-08-2019, 07.01 PM

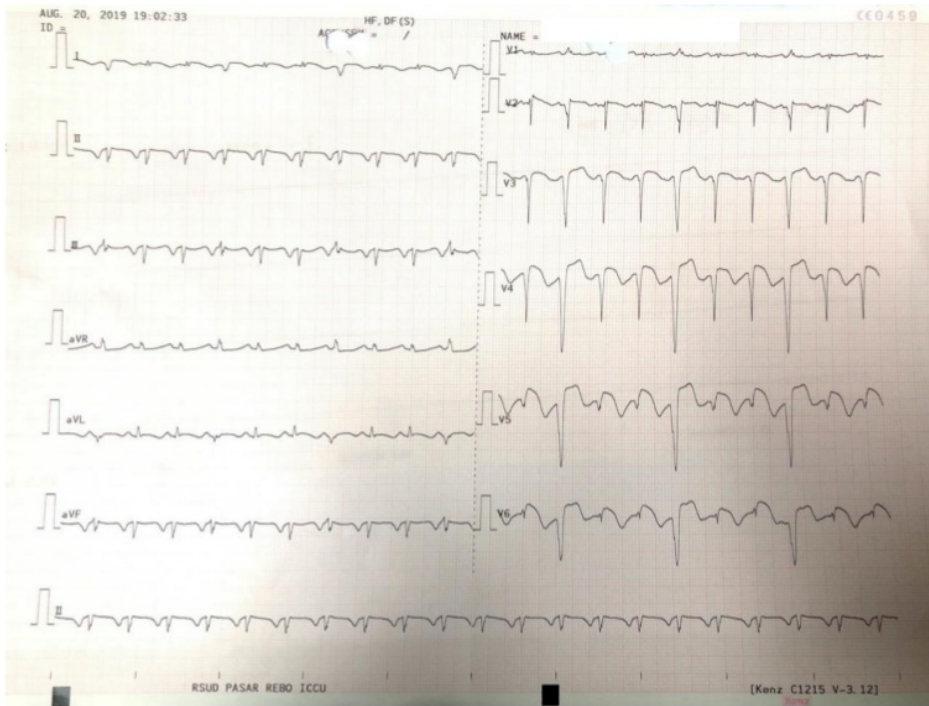


Figure 4. ECG Examination 20-08-2019, 07.02 PM

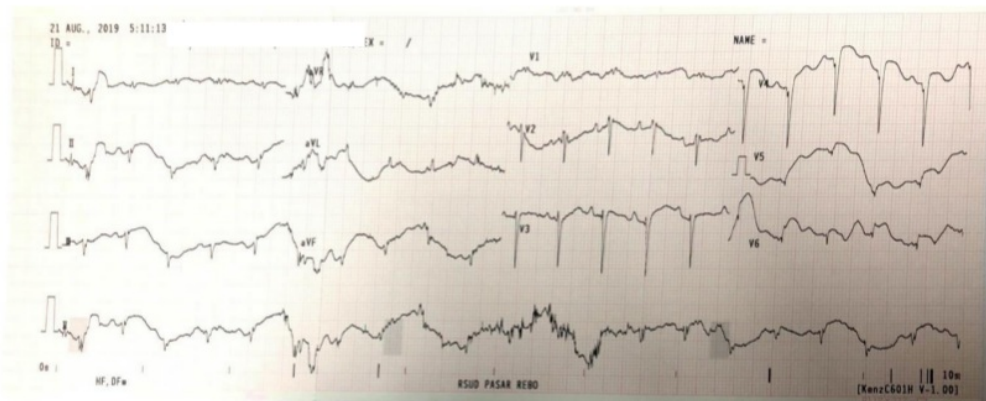


Figure 5. ECG Examination 21-08-2019, 05.11 AM

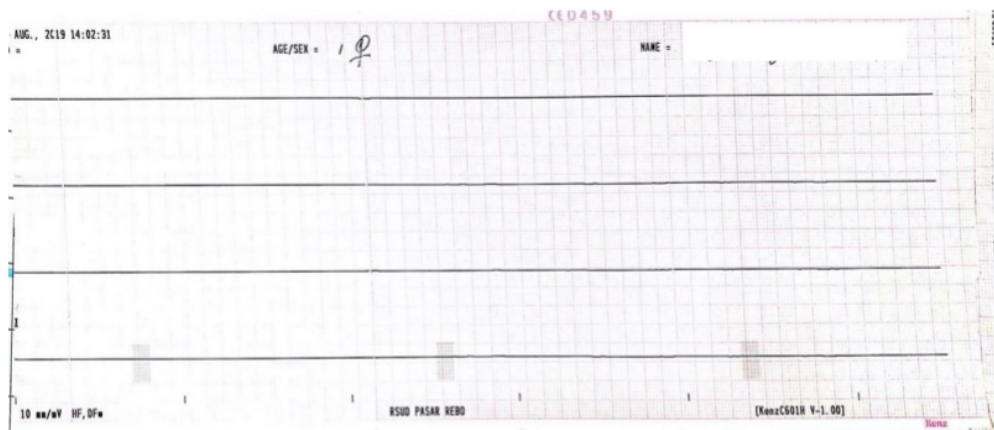


Figure 6. ECG Examination 21-08-2019, 02.02 PM

**Case 5**

A 57-year-old, underweight woman presented to the ER with a 7-hour history of left sided chest pain, the pain described as tightness sensation in the chest, radiating up into her left shoulder and back. She had a history of uncontrolled hypertension and untreated left sided breast cancer. There is no history of diabetes mellitus and stroke. On examination, blood pressure was 148/92 mmHg, pulse 70 bpm, and normal respiratory rate. The rest of the clinical examination was unremarkable. Twelve leads ECG showed sinus rhythm with ST elevation in leads V5-V9 (Figure 7).

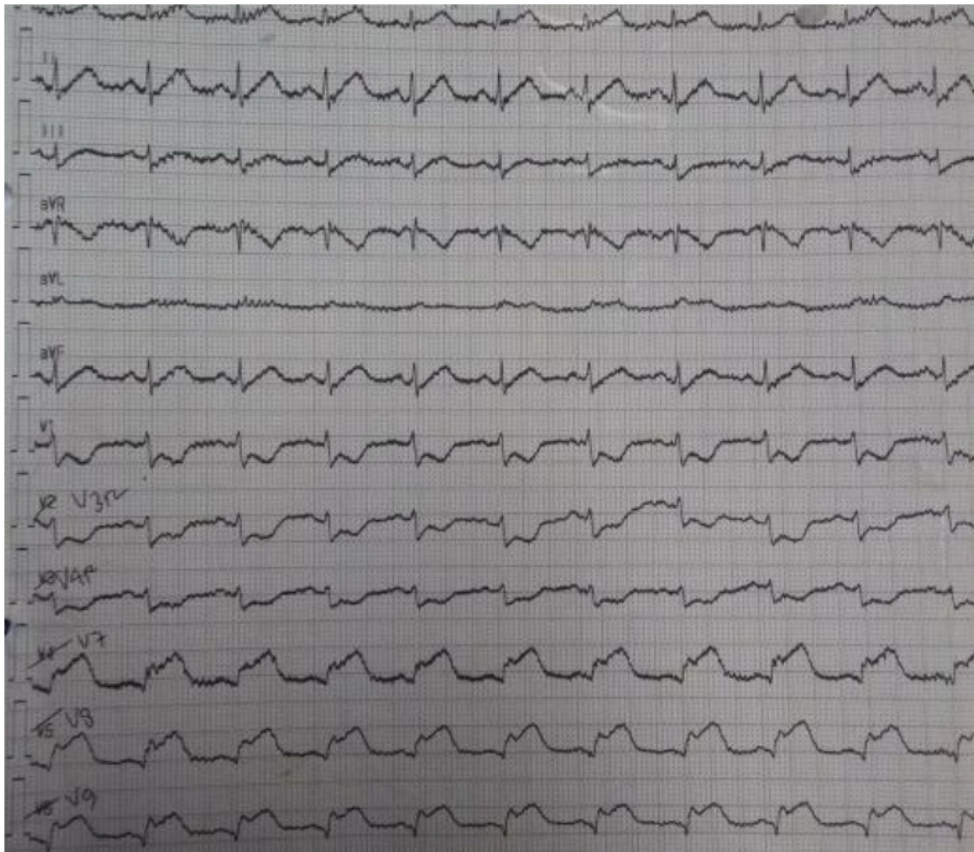


Figure 7. Initial ECG Examination

Acute coronary syndrome (posterolateral ST-elevation MI) was diagnosed and have no contraindication for fibrinolytic therapy. The patient administered with fibrinolytic (Streptokinase). Following fibrinolytic, the chest pain was completely subsided and her ST-elevation resolved (Figure 8).



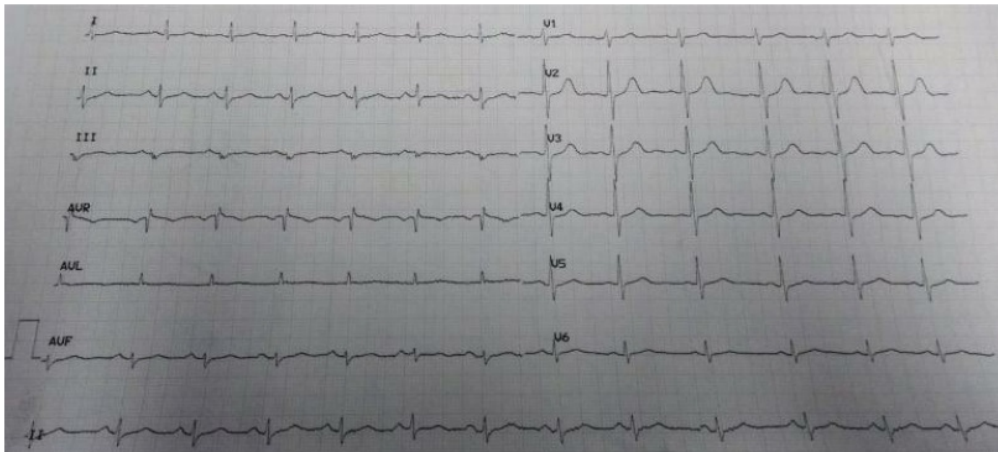


Figure 8. Post Fibrinolytic ECG Examination

She remained haemodynamically stable until 17 hours post fibrinolytic therapy when the patient experienced a sudden loss of unconsciousness. A brain CT was performed and showed intracranial haemorrhage (Figure 9). She was referred to the neurosurgeon who advised conservative management. Heparin, aspirin, and clopidogrel were discontinued.

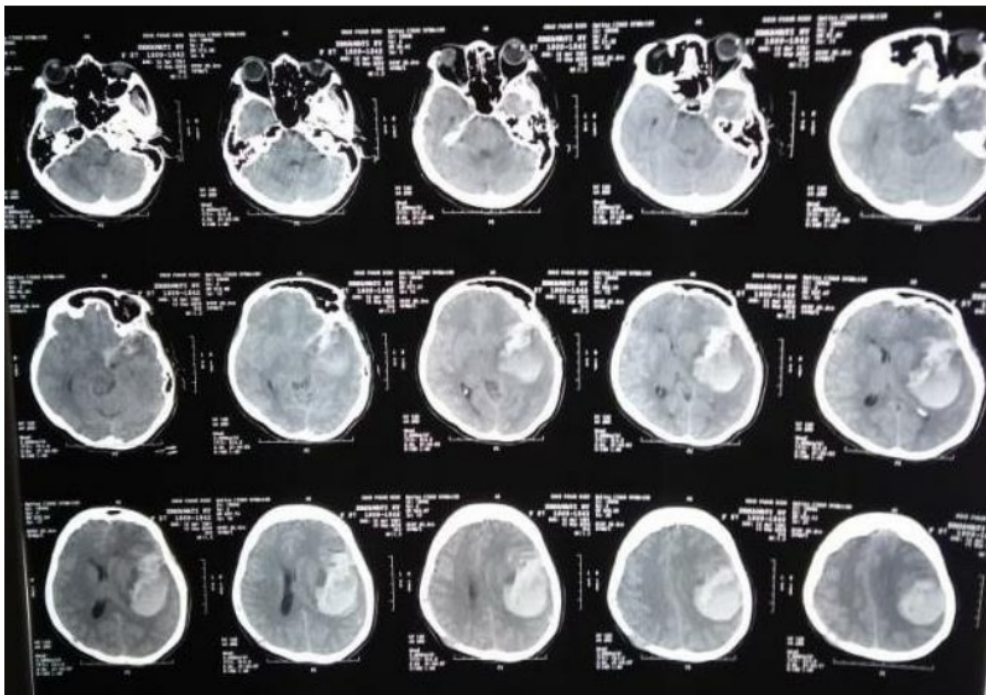


Figure 9. Brain CT

## Discussion and recommendation

<sup>6</sup> Cardiovascular disease are one of the most common causes of morbidity and mortality in women in the developed countries.<sup>6</sup> The Framingham Heart Study also shows women aged 44-64 years old has 8-9 times greater incidence of Myocardial Infarction (MI).<sup>7</sup> As presented in our case series, both patient are woman with age 65 years old and 57 years old, respectively. Thrombolytic therapy for STEMI patient still common, even though PCI is preferred. A systematic study with total sample size 404,556 patient shows in STEMI patient regarding treatment, 71.2% received thrombolytics.<sup>4</sup> In our case series, STEMI patient treated with pharmacological intervention, fibrinolytic therapy, seem reasonable.

The most serious complications of fibrinolytic therapy are death, re-infraction (AMI), and major bleeding (MB). The most MB that may be fatal in half to two-third of patients is haemorrhagic stroke.<sup>5,8</sup> Intracranial haemorrhage should be suspected in any patient who develops sudden neurological deterioration, a decline in the level of consciousness, new headache, nausea and vomiting or sudden rise in blood pressure (BP) after fibrinolytic therapy. Any symptoms which previously mention should alert the clinician and brain CT should be done to rule this out. The first 24 h is the most common time to happened, the patient should be monitored closely.<sup>8</sup> Similar with our patient, neurological deficit happened in both patient within 24 hours after thrombolytic therapy. We also performed brain CT on both patient and intracranial haemorrhage was found.

<sup>10</sup> There are four factors that identified as independent predictors of intracranial haemorrhage; age over 65 years, bodyweight below 70 kg, hypertension on hospital admission, and administration of alteplase.<sup>9</sup> Hypertension is known to be a major risk factor for CVD. Study had found that the increase of SBP and DBP were associated with impaired fibrinolytic potential.<sup>10</sup> In these cases, both patients had a history of hypertension, but one patient had controlled hypertension and used antihypertension medication routinely. Although antihypertensive treatment does reduce the risk of CVD, the results are usually not commensurate to what would be predicted.<sup>11</sup> This discrepancy may be caused by contributing factors, such as a prothrombic state, which is related to blood pressure level but is not corrected with antihypertensive treatment. Study had found that increased blood pressure is associated with decreased fibrinolytic potential and increased plasma viscosity supports the presence of a prothrombic state in hypertension.<sup>10</sup>

## Conclusion

Haemorrhagic stroke is one of the most serious and fatal complication during the first 24 h of fibrinolytic therapy. Clinician should follow up patient clinical status and be aware with red flag symptoms after fibrinolytic therapy. There are several contributed factors, hypertension is one of the major risk factors. In this case, patient with controlled hypertension had a haemorrhagic stroke after fibrinolytic treatment, this can caused by several factors such as a prothrombic state, which is related to blood pressure level but is not corrected with antihypertensive treatment.

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