Use of tenecteplase for thrombolysis of stroke patient (13HDC01676, 15 February 2016)

House officer ~ General physician ~ District health board ~ Regional public hospital ~ Emergency department ~ Alteplase ~ Tenecteplase ~ Thrombolysis ~ Stroke ~ Policies ~Training ~ Open disclosure ~ Right 4(1)

A 77-year-old man presented to an emergency department (ED) of a regional hospital after suffering an ischaemic stroke. Upon medical review, a decision was made by a house officer, in consultation with the consultant on call, that the man was an appropriate candidate for thrombolysis.

Thrombolysis is the breakdown of blood clots using types of drugs called tissue plasminogen activator (tPA) drugs and can be used in patients who have suffered an ischaemic stroke or a heart attack. There are a number of risks associated with thrombolysis, including intracerebral haemorrhage (bleeding in the brain).

The man consented to receiving thrombolysis and the house officer decided to prescribe tenecteplase rather than alteplase. Tenecteplase and alteplase are both tPA drugs, but in New Zealand tenecteplase is used for treatment of a heart attack (myocardial infarction) rather than ischaemic stroke. The house officer prescribed tenecteplase because she understood from nursing staff that there was no alteplase available at the hospital and was aware of studies which supported the use of tenecteplase in stroke.

Although it was usual practice for stroke thrombolysis to be administered in the Intensive Care Unit (ICU), the house officer decided to treat the man in the ED rather than the ICU. The house officer followed the New Zealand Formulary guidelines for the use of tenecteplase in heart attack. In doing so, she prescribed at least twice the dose of tenecteplase recommended for treatment of ischaemic stroke. In addition, the house officer prescribed tenecteplase to be administered as a 10% bolus with the remainder to be administered as an infusion over one hour (the correct mode of administration for alteplase), whereas tenecteplase should be given as a single bolus (ie, all at once). The house officer did not discuss her prescription of tenecteplase or the fact that the drug was administered in ED rather than the ICU with the consultant on call.

Partway through the administration of tenecteplase, the house officer was informed that alteplase was available at the hospital in the ICU. She telephoned the consultant on call for advice about whether or not to continue the infusion, who advised that the infusion should continue. Following the infusion of tenecteplase the man initially showed signs of improvement, but a computed tomography (CT) scan showed that he had suffered a brain bleed (intracerebral haemorrahage). The man died a few days later.

The DHB's relevant policy titled "the Stroke Pathway" referred to alteplase in some places but did not explicitly specify alteplase as the tPA drug to be used in the case of stroke thrombolysis. There was also confusion amongst nursing staff about the correct process for administering thrombolysis, and the house officer had not been oriented to "the Stroke Pathway" adequately.

It was held that the house officer breached Right 4(1) in failing to transfer the man to the ICU, in deciding to prescribe tenecteplase at the dose and via the mode of administration that they did, and in failing to consult the consultant on call about the use of tenecteplase.

It was also held that the DHB breached Right 4(1) in failing to ensure its staff had the right tools, including adequate policies and training, to provide stroke thrombolysis safely.

Adverse comment was made about the consultant on call as she did not appear to have provided the man or his wife with a timely and clear explanation of what had occurred. Open disclosure about the error and its potential consequences needed to occur, either to the man if he was competent, or to another appropriate person, in this case his wife.