Acute kidney failure study tests early diagnosis and intervention

With world-wide figures suggesting 50 per cent of patients who develop acute kidney failure don’t recover, the University of Otago’s Kidney in Health & Disease Research Group is keen to test new means of early detection through their HRC-funded research.

Professor Zoltan Endre, who heads the University’s Christchurch Kidney Research Group says the death rate for ICU patients with renal failure is up to 80 per cent, and between 40 and 50 per cent outside ICU.

“This is a high mortality, high frequency condition with a course which hasn’t been able to be modified for over 50 years. Part of the reason is that it has been diagnosed late and previous clinical trials have used interventions that were probably well beyond their therapeutic window.”

Currently, creatinine levels in the blood are used to test whether a patient is developing kidney failure, a process that can take several days for clinicians to be confident that intervention is needed.

The Group is part way through a proof of concept study that will eventually involve 600 patients in Christchurch and Dunedin.

Professor Endre says they have identified a urinary biomarker which can give them a result in as little an hour and they are testing its use in the clinical setting. Armed with this earlier detection ability, they want to trial a novel earlier intervention using erythropoietin (EPO), an established treatment for anaemia in patients with chronic kidney disease. Also known as an illegal performance enhancing drug in sport, EPO improves the blood’s oxygen carrying capacity by increasing haemoglobin.

“It works by allowing red blood cells, that would have died in the bone marrow, to mature and be released into the circulation,” says Professor Endre.

“We have done several studies demonstrating that this works as a kidney protective agent to prevent cell death in kidneys after ischaemic injury. It may also stimulate release of stem cells from the bone marrow and vascular development in the recovery phase - so there are a series of ways EPO might be helpful.”

Professor Endre says they are hoping the drug will prevent patients from developing complete kidney failure.

Of the 600 patients they hope to recruit, about a third will be put into the intervention study. The key aim with a proof of concept study is to see if the intervention is helpful and safe, Professor Endre explains.

“In addition this study is a world first in terms of the way we are looking at biomarkers in the generalised ICU population, both to see if we can predict kidney failure and in using a new biomarker to time intervention, and it is the first intervention study using erythropoietin to prevent kidney injury.”

They will also examine the 12-month outcome data for patients to compare outcomes for patients who have been given the current conventional treatment and those who had supplementary EPO.

This research is funded by the Health Research Council of New Zealand.