

POPULAR SCIENTIFIC SUMMARY

Could a new panel of biomarkers and artificial intelligence facilitate diagnosis of acute kidney injury in haemato-oncology patients? Will it be possible to treat this clinical syndrome earlier and more effectively and improve the prognosis in this group of patients?

Acute kidney injury is a common clinical syndrome characterized by a wide range of disorders in the human body, a rich spectrum of symptoms, and increased morbidity and mortality rates. Considerable progress has been made in recent years in identifying groups of patients at increased risk of kidney damage through the use of traditional and new biomarkers. Significantly, acute kidney injury affects nearly 50% of hospitalized haemato-oncology patients and is directly related to poor prognosis and an increased risk of death in hospital. Kidney damage may be asymptomatic at first, which is why it is not always possible to detect, for example, in blood or urine tests. Therefore, it is crucial for the patient's health to take action in early time so that no further organ damage occurs.

This study aims to check the presence and dynamics of changes in new biomarkers in urine and blood of early stage of acute kidney damage in haemato-oncology patients and the development of an artificial intelligence algorithm which allows faster, and more effective detection of this syndrome based on the collected data. One of the most promising biomarkers of kidney damage are circular RNAs due to their high stability structure in the urine and blood of patients, making them easier to detect. The tasks planned in the project will allow determining whether the selected panel of biomarkers and the designed algorithm are useful in this group of patients. Based on the available literature and scientific research, the project included biomarkers found in the urine or blood of patients with kidney damage during cancer disease.

The results of this project will enable early detection of acute kidney injury (potentially determining the causes and monitoring of the clinical syndrome) in haemato-oncology patients. The knowledge gained during the project will allow assessing the potential of using new biomarkers and artificial intelligence to improve the accuracy of diagnostics and faster implementation of appropriate nephrological treatment.