Predictors of 5-year mortality in young dialysis patients

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The analysis published in *Nephrology Dialysis Transplantation* evaluated for the first time the association of a large number of demographic, HD treatment and laboratory variables with mortality in patients on chronic hemodialysis treatment since childhood. The variety of retained risk factors identified by the analysis highlights the importance of multimodal intervention strategies in addition to adequate HD treatment.

The percentage of children and young people who have severe kidney disease and require renal replacement therapy (RRT) is relatively low at approximately 2%. The disease is life-changing for those affected, however. If transplantation is not available as an option, the children are dependent on dialysis treatment, which is generally carried out three times a week for 4 hours. A 'normal' childhood is barely possible in that case. The children are ill, but it is not only their quality of life that suffers, but also their prognosis: Children requiring dialysis have an approximately 55-fold mortality risk compared to the healthy population of the same age. Duration of dialysis and the age at the start of dialysis are generally considered to be risk factors, but these are factors that cannot be influenced.

It is highly important, therefore, to identify what other causes are behind the mortality rates and which risk factors can be influenced in order to improve the outcomes of young patients.

A study published yesterday in *NDT*, the official journal of the ERA-EDTA, investigated the risk factors. The authors analyzed a cohort of

363 patients under the age of 30 who had started dialysis therapy in childhood (at less than 19 years of age). 105 variables relating to demographics, HD treatment and laboratory measurements were evaluated for their significance as predictors of 5-year mortality. A flexible machine learning approach (random forest) was used for this purpose.

The results showed that low albumin and elevated lactate dehydrogenase were the two important risk factors. However, many other factors also had an impact, including a reduced red blood cell count, hemoglobin, albumin/globulin ratio, ultra-filtration rate, z-score weight for age, or inadequate dialysis dose (spKt/V below target).

"The variety of retained risk factors probably highlights the importance of multimodal intervention strategies in addition to adequate HD treatment", explains corresponding author, Verena Gotta, Basel, Switzerland.

NDT editor-in-chief, Professor Denis Fouque, Lyon, France, also draws attention to the utmost importance of providing comprehensive care to pediatric patients: "Nephrological care must not be confined to good dialysis treatment, but must also include factors such as nutrition, exercise, and the prevention of inflammation, anemia and cardiovascular disease. Only by applying a multimodal approach can we reduce the intolerably high mortality risk among pediatric and adolescent dialysis patients. The study is important because it provides arguments vis-à-vis health authorities for more intensive care of these patients."

More information: Verena Gotta et al, Identifying key predictors of mortality in young patients on chronic haemodialysis—a machine learning approach, *Nephrology Dialysis Transplantation* (2020). DOI: 10.1093/ndt/gfaa128

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