A glycomic serum marker analysed at one week after liver transplantation is an independent predictor of graft loss during the first year after liver transplantation

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Background and Aims: Poor graft function after liver transplantation (LT) remains a challenge for transplant professionals and sometimes requires retransplantation. Pretransplant estimation of graft function using scores like donor risk index has limited use in individual patients. Diagnosis of early allograft dysfunction after liver transplantation by clinical criteria is associated with graft loss. However, biomarkers that reliably identify patients at risk for graft failure after LT are lacking. Analysis of N-glycans in serum (glycomics) has shown to reflect the underlying liver function in liver disease but has never been assessed after liver transplantation. The aim of this study was to assess the potential of serum glycomics as predictive markers for graft and patient survival after liver transplantation.

Methods: In this monocentric prospective cohort 127 liver transplant patients were included between 1 December 2012 and 31 December 2014. Serum samples were collected just before and on daily bases during the first 2 weeks after liver transplantation. Glycomic profiles were analysed using an optimized glycomic technology on a DNA sequencer. The major outcome parameters (graft and patient survival during 1 year) were related to the observed glycomic alterations and the best predictive association was searched for using cox regression analysis.

Results: The assessment of 2 serum glycans NG1A2F (an agalacto, core-alpha-1,6-fucosylated biantennary glycan structure) and NA3 (a triantennary glycan), combined as log(NG1A2F/NA3) on day 7 after liver transplantation was strongly associated with graft loss (hazard ratio = 7.222; p<0.001; 95% CI 2.352-22.182) and patient death (hazard ratio = 3.885; p=0.30; 95% CI 1.127-13.276) during the first year after liver transplantation (cox regression analysis). In a multivariable cox regression model including early allograft dysfunction (according to Olthoff) and Donor Risk Index, this glycomic marker, called GlycoTransplantTest, was the only independent predictor of graft survival (p=0.003).

Conclusions: Assessment of GlycoTransplantTest, a glycomic serum marker, on day 7 post liver transplantation is a strong and independent predictor of graft survival during the first year after liver transplantation. These findings add to the increasing evidence that serum glycomics are sensible markers of liver dysfunction.