Objective

To determine the impact of histological factors observed in zero-time biopsies on 3 years post transplant kidney allograft function.

To compare the semi-quantitative Banff Classification with digital quantification of fibrosis.

Methods

Biopsies from allograft kidney cadaver performed at implantation time in the last three years (2005-2007), with at least three year follow-up, are reviewed.

Chronic changes in glomeruli, vessels, tubules and interstitium (Cg, Ah, Cv, Ct, Ci) were semi quantitatively scored (0-3) using the Banff Working Classification. Glomeruloesclerosis (GE) and GE / Total glomerulus are registred.

By adding these individual chronic changes a Banff Chronic Sum Score was generated.

Sirius Picro Red staining was used for identification of collagen I and III under polarized light. (Fig.1)

Percentage of cortical biopsy area stained was quantified using a computer program (Leica® system).

Glomerular filtration rate (GFR) at 3 years was calculated according to Cockcroft-Gault formula.

Results

63 biopsies evaluated.

Immunosuppressive protocols included induction with ATG or Basiliximab, calcineurin inhibitors (tacrolimus in 86,9%) or mTOR inhibitors(7,1%) plus mycophenolate mofetil and prednisolone.

The histological, clinical features and three years GFR value are described in Tables 1 and 2.

A significant negative linear regression between %PSR/ GFR at 3 year post-transplantation was established. (Graph 1)

A significant negative correlation between the individual Banff scores, Ah, BCS and 3 years GFR were found.

No correlation was found between SG, SG/TG and 3 years GFR.

No correlation was present between fibrosis parameters evaluated by semi-quantitative and digital methods.

BCS and donor kidney age had significant negative predictive value in multivariate linear regression models.

Conclusions

The % cortical area stained by Sirius predicts short term kidney function in univariable linear regression but involves extra-routine and expensive-time work.

We think that Sirius Picro Red must be regarded as a research instrument.

The Banff chronic sum seems a good and easy to perform tool, available to every pathologist, with significant predictive short-term value.