IL-6 determination in serum of kidney graft recipients by a new bedside test. Its diagnostic relevance.

J. Kaden, G. May, V. Strobelt - Vivantes Institute of Laboratory Medicine, Berlin and Transplantation Centre Berlin, Charité

Introduction

The multifunctional Interleukin 6 (IL-6) is the main mediator of the acute phase reaction and earliest indicator of inflammation, tissue damage, hypoxia or infection. After kidney transplantation ongoing rejections are announced by elevated urinary but hardly serum IL-6 concentrations (Kaden J., R. Priesterjahn, Transplant Int 13[2000],S34-41). On the other hand the differentiation between bacterial and viral infections is relatively simple and valid by serum IL-6 concentration (Kaden J. et al. Transplant Int 9[1996], S63-67). The nowadays used immunoassays for IL-6 quantification are relatively time consuming, need a special technical support and well trained laboratory staff. Recently a new IL-6 bedside test was introduced by Milenia Biotec. The results are available after 20 minutes by visual chip testing or photometry as preferred method.
We evaluated this test with respect to its diagnostic significance at the first time after kidney transplantation. In a retrospective study a total of 269 Sera stored at -20 oC from 27 kidney graft recipients were selected, blinded and measured „en bloc“.

Patients

Recipients	**n = 27**
Female/Male	14/13
Age (years), x ± s	44,0 ± 9,9
1st/2nd Grafts	24/3
Maximum panel cytotoxicity ≤5% / >5%	21/6
Cold ischemia time (min), x ± s	1039 ± 365

Basic immunosuppression

Azathioprine (change to Cellcept in one case at day 30)
Prednisolone
Ciclosporin (change to FK 506 in one case at day 18)

Induction therapy (intraoperatively)

[Kaden J., Optimal management of induction therapy with ATG in kidney allograft recipients. Int.J.Immunotherapy 15 (1999), 115-124]

ATG Fresenius (9 mg/kg body weight, bw)	n = 15
Lymphoglobulin Merieux (30mg/kg bw)	n = 8
RATG Biotest (1,5 mg/kg bw)	n = 3
Pressimmun Behring (60 mg/kg bw)	n = 1

Material

Serum samples (stored at -20°C)
Total number: n= 269
Procedure: Selection - Blinding - Measurement 'en bloc'

	Selection of defined post transplant courses	No. of recipients n	No. of sera n
Group 1	No post transplant complication until discharge	6	35
Group 2	CMV-infections	6	71
Group 3	Rejection crises	8	72
Group 4	Bacterial infections	7	91

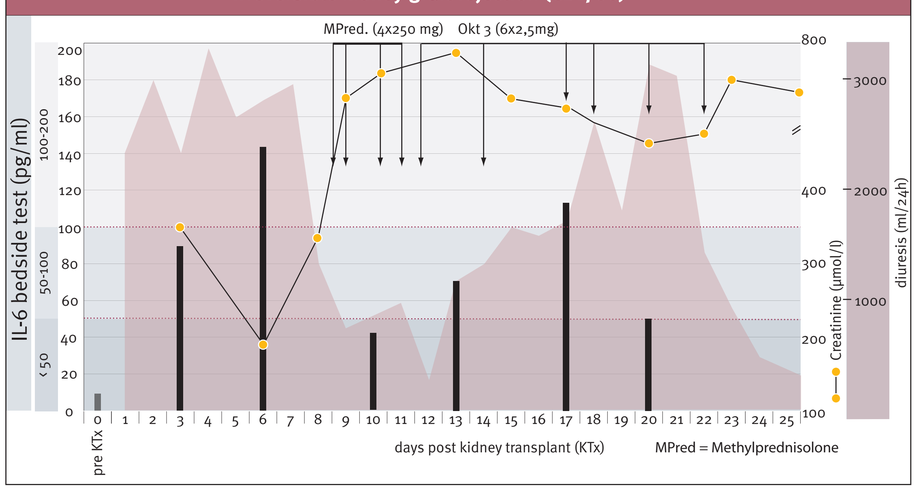
Method

IL-6 bedside test: MILENIA BIOTEC GmbH, 61231 Bad Nauheim, Hohe Str. 4-8, Germany. Volume of serum necessary: 100µl. Turn-a-round time: 20 min

Visual interpretation: by means of an evaluation card. The colour intensity of the test band (caused by patient's serum) is compared to different colour intensities shown on the evaluation card. Four different ranges of IL-6 levels are differentiated: <100, ≥100, ≥300, ≥1000 pg/ml

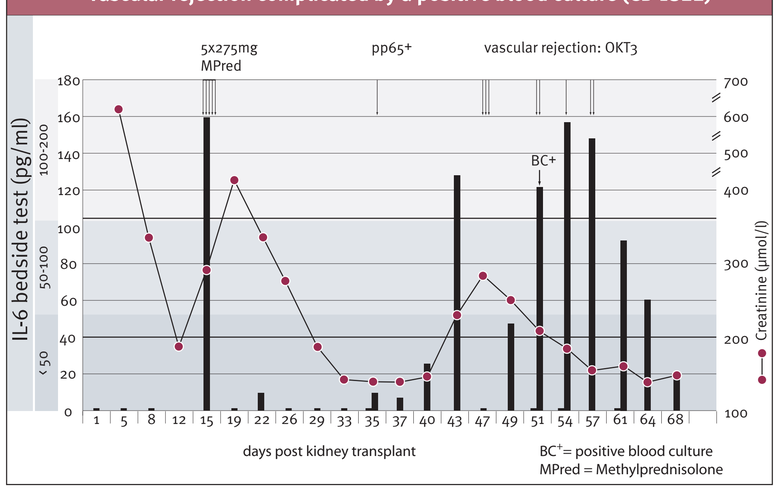
Photometric measurement: by means of PicoScan. The IL-6 level is calculated according to a stored standard curve and allows the differentiation of six ranges: <50, 50-100, >100-200, >200-500, >500-1000 pg/ml.

irreversible kidney graft rejection (CD1700)



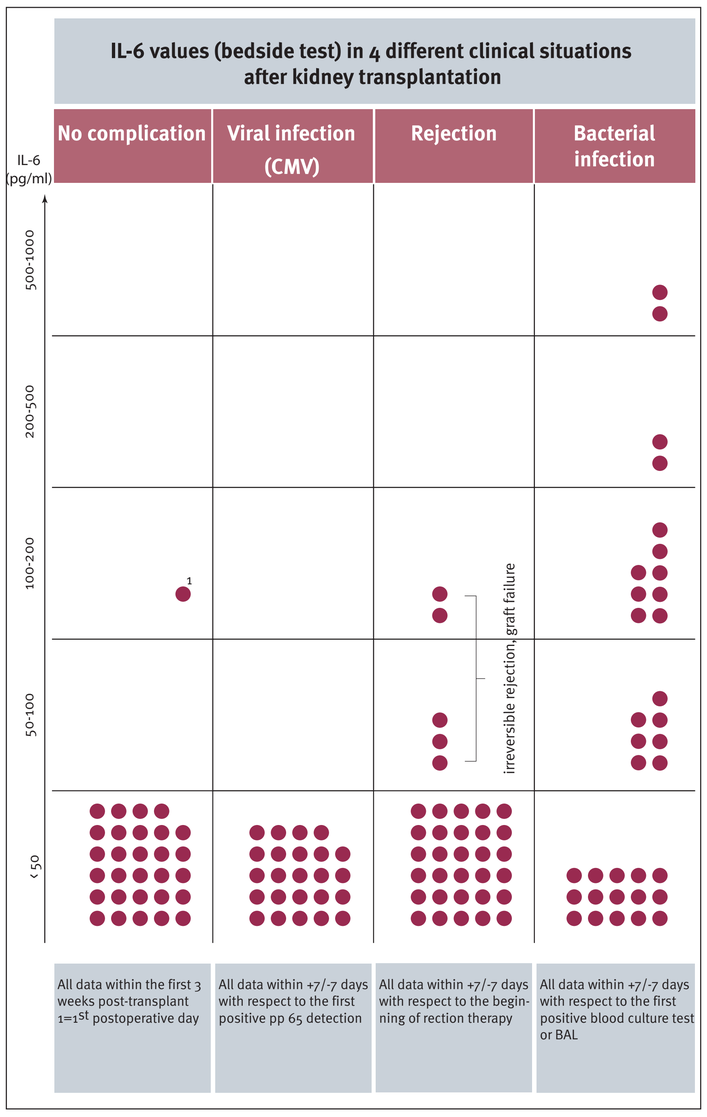
Elevation of IL-6 serum concentration in connection with an irreversible graft rejection indicating a strong inflammatory process.

Vascular rejection complicated by a positive blood culture (CD 1822)

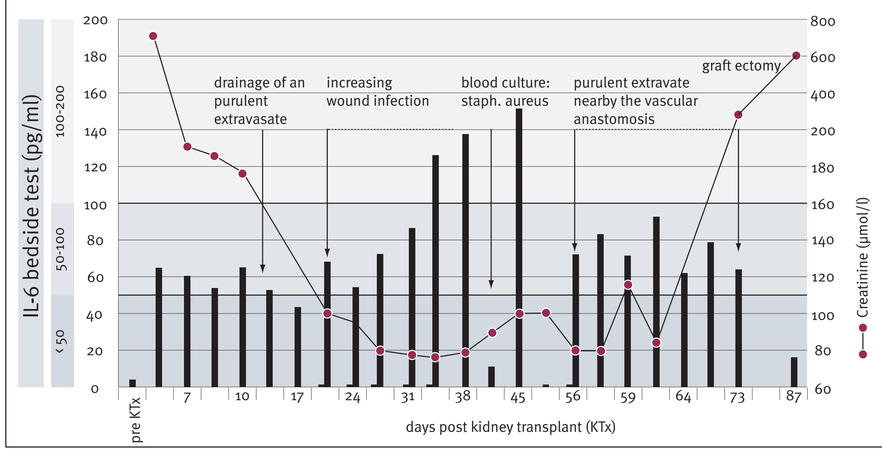


Elevation of IL-6 serum concentration in connection with a bacterial infection complicating a reversible vascular rejection. The occurrence of CMV-pp65 antigen, however, was not associated with changed IL-6 level.

IL-6 values (bedside test) in 4 different clinical situations after kidney transplantation



Ectomy of a functioning kidney graft as a result of an incurable infection (CD 1814)



Long-lasting elevation af IL-6 serum concentration during an incurable staphylococcus aureus infection.

Conclusions

1. Viral infections did not result in an increase of IL-6 more than 50 pg/ml.
2. The diagnostic relevance of this new quantitative IL-6 bedside test is as high as that of other enzymimmunoassays.
3. Advantages: The results are obtained already after 20 minutes and visual chip reading is possible.
4. If possible, photometry should be preferred to visual chip reading since the results are more precise.

Address: Dr. Jürgen Kaden, Klinikum im Friedrichshain, Institute of Laboratory Medicine, Landberger Allee 49, 10249 Berlin, Germany