Introduction and Aims: Residual renal function is important for quality of life, morbidity and mortality. Beta Trace protein (BTP) a low-molecular-weight-protein (molecular weight 23 - 29 kDa) repeatedly has been suggested as a marker of renal function. Recent studies showed that BTP is hardly removed by renal replacement therapy (RRT). We analyzed the influence of hemodialysis and hemofiltration performed with different high flux dialyzers on the elimination of BTP.

Methods: 23 dialysis patients on chronic RRT (16 males and 7 females), aged 57.6 years ± 11.8 years [mean ± standard deviation (SD)] participated in the study. All patients were on stable and long-term treatment for at least twelve months. Treatment prescriptions were standardized, blood flow was set on 300 ml/min, dialysis flow 500 ml/min. Data were ultrafiltration (UF)-corrected and reduction was expressed in percent (%). In total we performed 207 treatment sessions. Each patient received hemodialysis (HD), hemodiafiltration (HDF) in pre- (pre-HDF) and postdilution (post-HDF) mode with three different high flux dialyzers: 2 polysulfone membranes (FX 60, effective surface 1.4 m², ultrafiltration coefficient (UFC) 46 ml/h/mmHg; Fresenius Germany and Braun HI-PS 18, effective surface 1.8 m², UFC 55 ml/h/mmHg; Braun Germany), as well as one polypropylene membrane Elisio 19, effective surface 1.9 m², UFC 76 ml/h/mmHg; Nipro Germany. Samples were collected before and after therapy. Serum levels of BTP, Cystatin C, urea, creatinine, and beta-2-microglobulin (B2MG) were analyzed accordingly. Data are given as means + 95% confidence intervals (95%CI)

Results: Mean treatment time per session was 4.6 hours (95%CI 4.5 - 4.7). Pretreatment levels of BTP were 8.8 mg/l (95%CI 8.3 - 9.2). Post-treatment BTP concentration in serum was 8.1 mg/l (95%CI 7.7 - 8.6) n.s.. Conventional HD treatment did not significantly reduce BTP levels [pre-treatment 8.8 mg/l (95%CI 8.0 - 9.6) vs. post-treatment 8.7 mg/l (95%CI 7.9 - 9.5)] nor did pre-HDF [pre-treatment 8.8 mg/l (95%CI 8.0 - 9.6) vs. post-treatment 8.8 mg/l (95%CI 7.9 - 9.6)]. In contrast, post-HDF resulted in a somewhat more pronounced BTP reduction [pre-treatment 8.7 mg/l (95%CI 7.9 - 9.5) vs. post-treatment 7.0 mg/l (95%CI 6.6 - 7.6) n.s., resembling 19.1% (95%CI 15.5 - 22.7)% n.s.. In detail, usage of Elisio 19 resulted in highest BTP reduction [17.7 % (95% CI 14.1 - 21.2)%] followed by FX 60 [3 % (95%CI -1.1 - 7.2)%] and HI-PS 18 [0.5 % (95%CI -3.9 - 5)%], respectively. As expected levels of creatinine, urea, B2MG and Cystatin C were significantly affected by either treatment (data not shown).

Conclusions: HD and pre-HDF hardly decrease BTP levels, whereas post-HDF tends to reduce BTP levels albeit not significant. Slight variations in BTP concentrations are due to the high ultrafiltration coefficients of each dialyzer (76 vs. 55 vs. 46 ml/h/ mmHg). Overall different renal replacement therapies exert no significant influence on the serum level of BTP irrespective of the applied dialyzers. These results underline previously published data and suggest BTP as a useful marker of residual renal function.