INTRODUCTION AND AIMS: Middle Molecules (MM) removal, inflammation and nutritional status are determining factors in the prognosis of chronic hemodialysis patients. High-Flux dialyzers (HF) allow in standard hemodialysis an efficient removal of MM by causing albumin loss which may limit their use. Their effect on the production and elimination of pro-inflammatory cytokines (PIC) has not been studied.

METHODS: 30 patients were included in an observational study. 3 types of HF membranes with the same surface area (2m²) were compared in standard bicarbonate hemodialysis: PEPA (low pore size) (5 pts), Helixone (18 pts), Polyphenylene (7 pts). Reduction rates (RR) of urea, phosphorus, creatinine, β2-microglobulin, myoglobin, and RBP were measured during one hemodialysis session. Plasma concentrations of PIC (IL-6, TNF-α and IL-1β) were measured before and after the session. The loss of albumin in the effluent dialysate was measured with the Polyphenylene membrane.

RESULTS: Kt/V and RR of small molecules are identical according to the type of membrane. RR of β2-microglobulin are comparable whereas myoglobin RR for PEPA and Polyphenylene membranes are higher than those for Helixone (0.50 ± 0.14, 0.59 ± 0.13 vs 0.24 ± 0.06, p < 0.0001). RR of RBP for Polyphenylene membrane is higher than Helixone (0.37 ± 0.15 vs 0.09 ± 0.25, p = 0.013). Plasma concentrations of CKI do not vary significantly between the beginning and the end of the session. The loss of albumin in dialysate for Polyphenylene, the most efficient membrane, is 1.97 ± 1 g/session. There are significant differences between membranes for the heaviest MM removal (myoglobin MW = 17184 Da and RBP MW = 21200 Da). The values are identical to those observed in hemodialfiltration. The most efficient membrane does not cause albumin loss beyond the recommended thresholds (5g/session). No significant increase in PIC concentration was observed.

CONCLUSIONS: Standard hemodialysis with HF Polyphenylene membrane allows middle molecules removal close to performance levels obtained in hemodialfiltration, without PIC production and without risk of protein malnutrition by albumin loss.