Introduction: Brain Natriuretic Peptide (BNP) is secreted by cardiomyocytes under stretch condition. High blood levels are associated with decreased patient survival in heart failure patients. This association has been also reported in hemodialysis (HD) patients (Zoccali JASN 2001) for whom it is difficult to know if BNP increase is related to the cardiac condition or fluid overload. In our unit we assess monthly plasma BNP level in all patients. We report the BNP change in the first months of HD therapy in incident patients who undergo sustained fluid excess correction and its relationship with cardiac history.

Methods:
- Retrospective study including all incident HD patients from May 2008 to December 2012
- Follow-up: until September 2014
- BNP assessment: Monthly (M) from M1 to M6 and predialysis mid-week
- CH patients: Patients above M6-BNP median were at higher risk of dying (Figure 6). Only M6-BNP (p=0.0152) was related to mortality in the Cox analysis**.
- CH- patients: Patients above M6-BNP median were at higher risk of dying (Figure 5). However, only age (p=0.0024) was related to mortality in the Cox analysis**.
- CH+ patients: Patients above M6-BNP median were at higher risk of dying (Figure 4). Age (p=0.007) and M1-BNP (p=0.038) were significantly and independently related to mortality (Cox multivariate analysis)*.

Results:
- Total incident patients during the period: 242
- Excluded patients for missing data: 6
- Patients included in the analysis: 236
- Follow-up: 2.3±15 years (extr:0-6.0)
- Average BNP at HD start: 1088±1284 pg/ml
- According to CH: 705 (CH-) vs 1601 (CH+) pg/ml (Figure 1)
- BNP at M1 and mortality (Kaplan Meier according to median): displayed in Figure 2 (patients CH-) and in Figure 3 (patients CH+). The Cox analysis (including age, gender, cancer H, diabetes and M2-BNP) found associated with survival age (p=0.006) and M1-BNP (0.0439) in CH-patients and M1-BNP (0.0016) in CH+ patients.
- BNP change (Δ) between M1 and M6:
  - M1-M6 BNP Δ: significant decrease in the whole population and in the 2 CH sub-groups (see Table 1)
  - M1-M6 BNP Δ: significantly correlated with fluid removal (BW decrease between HD start and M2 (BWΔ), more importantly in CH-patients (see Table1).
  - M1-M6 BNP Δ (stepwise multiple regression): significantly and independently related to CH (p=0.0051) and fluid removal (p<0.0001) in the whole group; In CH- and CH+ patients significantly and independently related to fluid removal (respectively p<0.0001 and p=0.0204).
- BNP at M6 and mortality:
  - Whole group: Patients above M6-BNP median were at higher risk of dying (Figure 4). Age (p=0.007) and M6-BNP (p=0.018) were significantly and independently related to mortality (Cox multivariate analysis)*.
  - CH patients: Patients above M6-BNP median were at higher risk of dying (Figure 5). However, only age (p=0.0024) was related to mortality in the Cox analysis**.
  - CH+ patients: Patients above M6-BNP median were at higher risk of dying (Figure 6). Only M6-BNP (p=0.0152) was related to mortality in the Cox analysis**.

Conclusions: These data demonstrate that the BNP level in incident HD patients is related to both fluid excess and cardiac status. Fluid removal decreases significantly BNP in both CH- and CH+ incident patients. It illustrates the reversibility of fluid overload toxicity on the myocardium. Whereas BNP has a constant prognostic value in CH+ patients, it relationship with outcome is less pronounced in CH- patients in which BNP level appears more related to reversible fluid overload than to structural cardiac damage. Hence we propose longitudinal follow-up of BNP level as a marker of cardiac impact of fluid overload. It is an important tool in the guidance of fluid overload correction. Further studies combining BNP with bioimpedance and echocardiography are urgently needed to understand more precisely its significance and prognostic value.