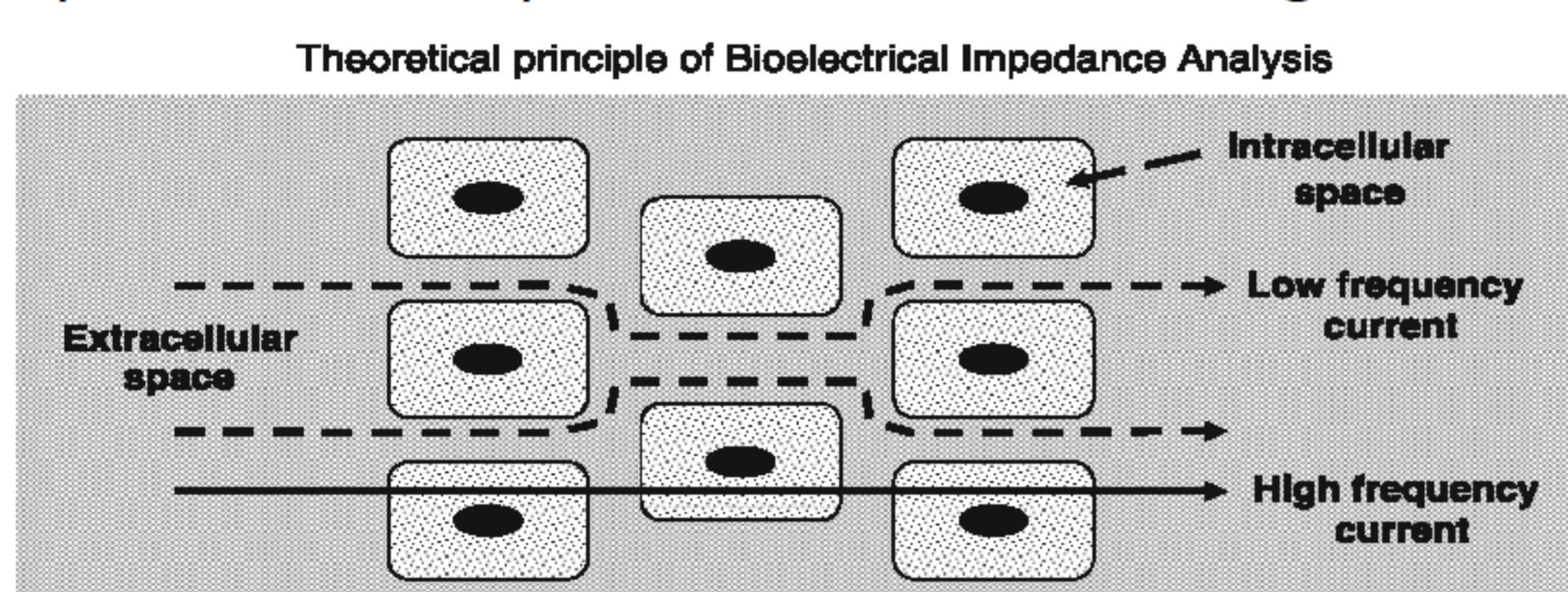


Background and objectives

Hypertension (HTN) due to volume overload (VOL) is a common finding in hemodialysis (HD) patients and it increases cardiovascular mortality. HTN correlates with increased serum values of atrial natriuretic peptide (sANP). HD patients might benefit from a better systolic blood pressure (SBP) control if VOL is determined and accurate dry weight (DW) is targeted at HD treatments. VOL estimation and accurate DW in HD patients is deficient with conventional clinical practice (physical examination, pre-HD weight gain, intra-dialytic blood to avoid hypotension).

The Spectroscopic Bio-Impedance BCM (Body Composition Monitor, Fresenius Medical Care, Ger) is a non-invasive tool than can be used in clinical settings of HD practice and helps to determine patient VOL and thus to target an accurate DW.

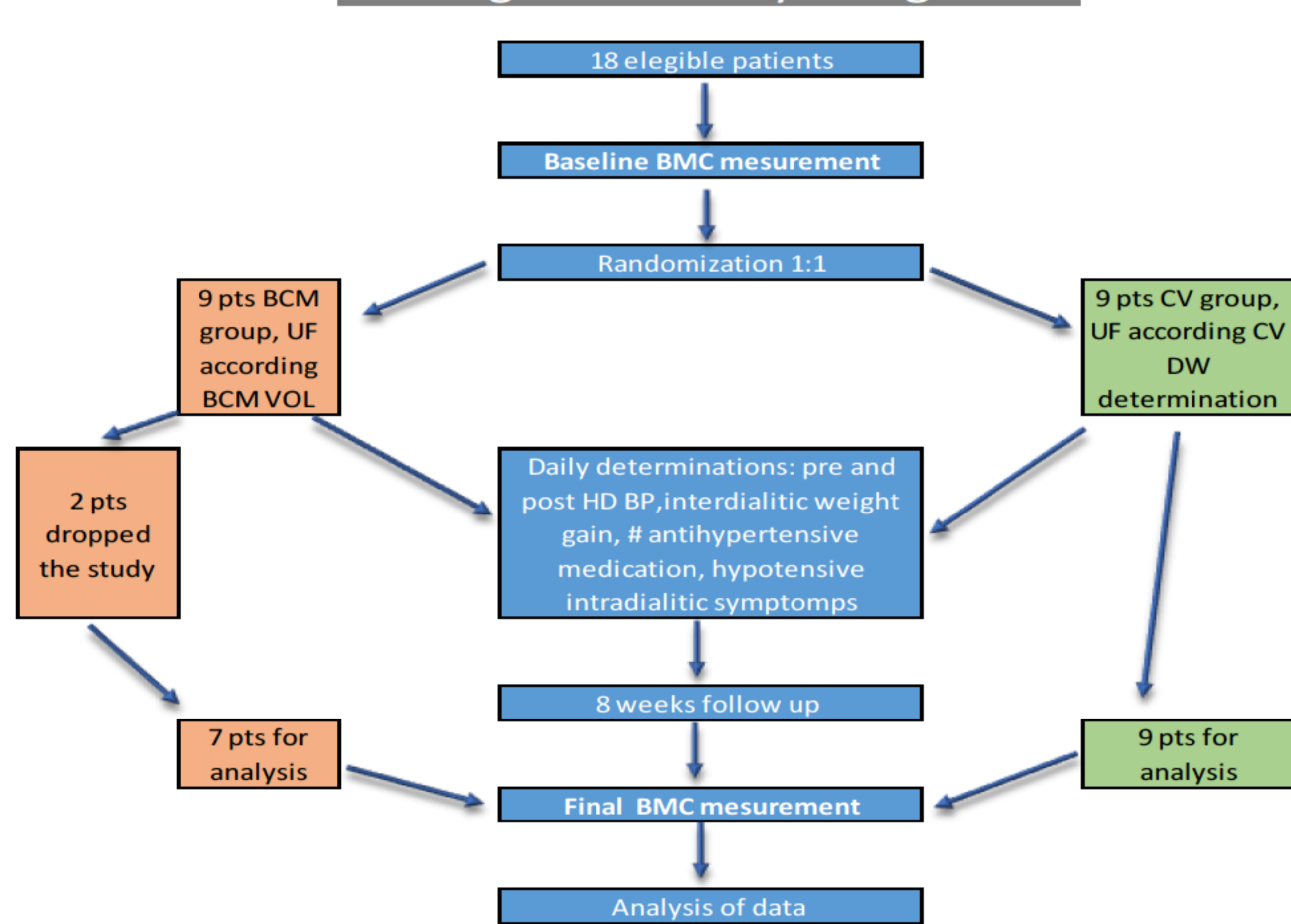


The purpose of this study was to compare sANP changes and its impact on antihypertensive medication when VOL was assessed with the BMC vs CV method.

Methods

Eight weeks follow up of a randomized, controlled, open clinical study among HD prevalent pts at Hospital Civil Guadalajara. BMC vs Conventional (CV) VOL assessment group. VOL was assessed pre-HD treatment for both groups of patients. Socio-demographic, clinical, laboratory values were recorded. BP was recorded at the beginning and end of each HD treatment. Antihypertensive medication was recorded as well. Ultrafiltration rate never exceeded 1L/hr regardless of the amount of VOL. Improvement in BP was considered when patient maintained BP values <140 / 90mmHg during HD. sANP was determined baseline and at the end of the study.

Figure 1: study design



Results

Two patients in BCM group dropped out the study (1 kidney transplant, 1 withdraw consent). A 30% reduction in sANP levels was observed in the BCM group (7 vs 2 patients in the CV group, RR=4.5 (IC 95% 1.3-15), p<0.01). No difference between the groups was observed at the end of the 8 weeks regarding the average SBP (average SPB in the BCM group 122.1 +/- 20.7 mmHg vs CV group 124.4 +/- 26.9 mmHg (p = 0.85). When baseline and final SPB were compared within groups, BCM had a statistically significant decrease in the SBP (p = 0.004), while the CV group did not (p = 0.22). Four patients in BMC group (57.5%) stopped antihypertensive medication, whereas none of the patients in CV group did (RR=0.25 (IC95% 0.09-0.66), p=0.01).

No statistical difference was observed between the 2 groups for dyspnea (p= 0.58) and cramps (p= 0.43). No hypotensive symptoms were reported in any group. Three patients (42%) reached the ideal DW in the BCM group vs 2 (22%) in CV group (p= 0.59, RR 1.59 (0.49-5.08)). See tables 1 and 2.

Table 1: Patients characteristics

Table 1	All n=16	CV group n=9	BCM group n=7	p
Age	41	46± 3	36± 4	
Male, (%)	6 (37.5%)	7 (77%)	5 (71%)	0.35
HD vintage (years)	2.65	4	1.3	0.06
Previous DP, (%)	2.5 (15.6%)	3 (33%)	2 (29%)	0.05
Diabetes, (%)	5.5 (34.37%)	6 (66%)	5 (71%)	1.05
Weight (kg)	65.05	65.4	64.7	0.92
Baseline BP (mmHg)	143.5	142	145	0.89
Pre-HD SBP (mm/Hg)	149.5	149	150	0.59
Post-HD SBP (mm/Hg)	141	142	140	0.78
SBP < 140mmHg, (%)	6 (37.5%)	0	6 (85.7%)	< 0.01
Heart rate (min)	84.25	85	84	0.08
Intradialytic symptoms of hypotension	0	0	0	N/A
Volume overload (L)	1.925	1.8	2.05	0.31
Residual urine volume (ml/24hrs)	157.5	165	150	0.07
Baseline use of antihypertensive medication, (%)	5.5 (34.37%)	5(55%)	6(85%)	0.08

Figure 2: Baseline and final average BP between groups

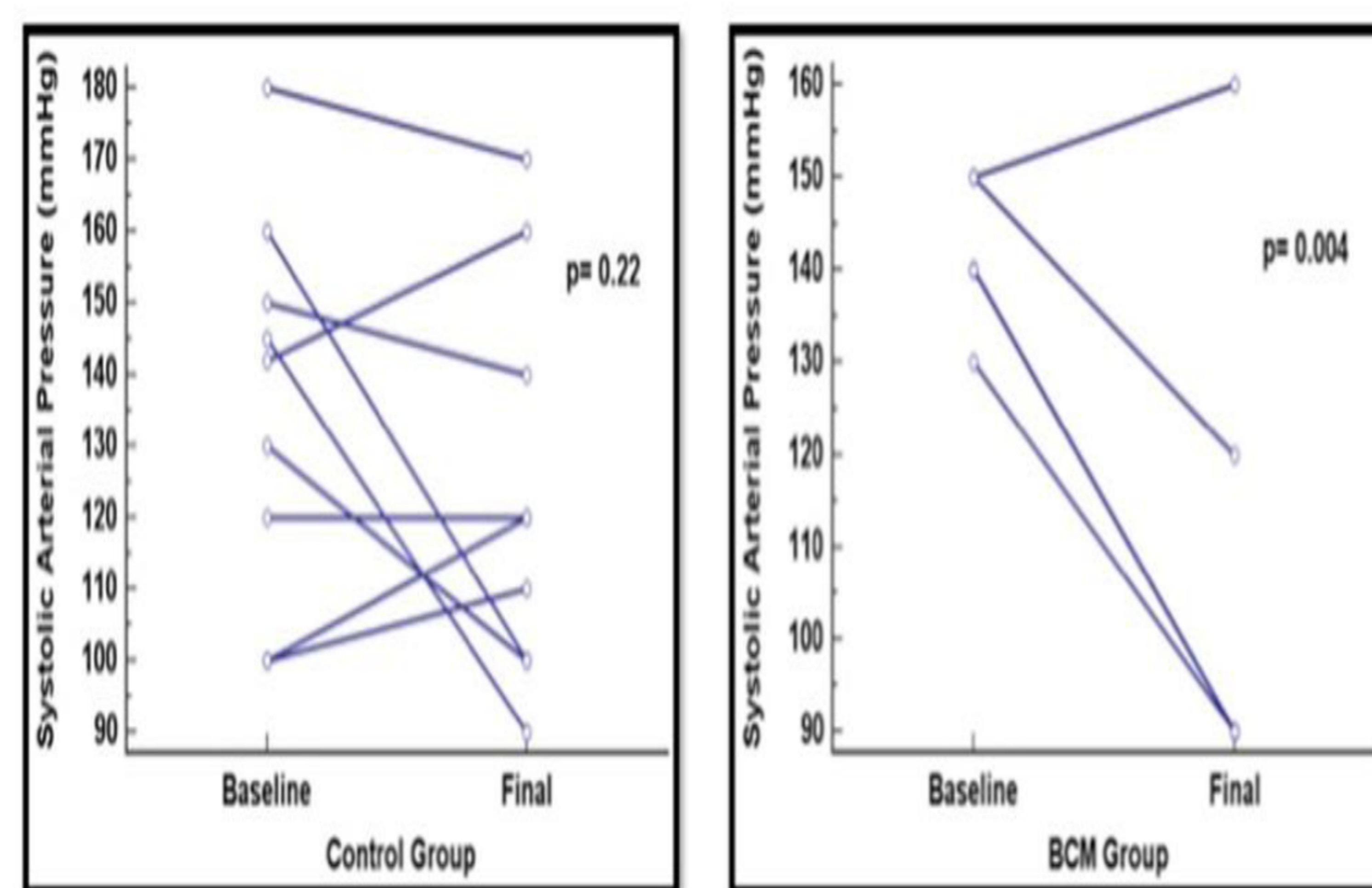


Table 2 : Baseline and final effects on BP and sANP

Table 2	All n=16	CV group n=9	BCM group n=7	RR (IC 95%)	p
Baseline BP, mmHg	143.5	142	145	NA	0.89
Pre-HD SBP, mm/Hg	149.5	149	150	NA	0.59
Post-HD SBP, mm/Hg	141	142	140	NA	0.78
SBP < 140mmHg, (%)	6 (37.5%)	0	6 (85.7%)	0.1 (0.01-0.64)	< 0.01*
Heart rate (min)	84.25	85	84	NA	0.08
Baseline aANP, (median)	855.06 (1487)	448.8 (552.8)	1377 (2127.1)	NA	0.3
Final sANP, (median)	700.6 (1145.4)	476.2 (618.1)	989.1 (1611.7)	NA	0.45
Decreased sANP, (%)	9 (56.2%)	2 (22%)	7 (100%)	4.5 (1.3-15.2)	<0.01*
# pts that achieved DW, (%)	5 (31.2)	3 (42.8)	2 (22.2)	1.59 (0.49-5.08)	0.59
Withdrawal of antihypertensive medication (%)	4 (25%)	0	4 (57.5%)	0.25 (0.09-0.66)	0.002*

Conclusions

sANP decreased in all patients in the BCM group and 57.5% of them stopped antihypertensive medication, whereas none in the CV group did.

With the use of BMC, more HD patients achieved a SBP <140mmHg without significant adverse effects.

A longer follow up and a large sample size is needed to assess these findings in daily clinical setting.

Contact: carlosrgalindo@hotmail.com, krenoirte@hotmail.com