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Background and objectives

Hypertension (HTN) due to volume overload (VOL) is a common finding in hemodialysis (HD) patient and it increases cardiovascular mortality. VOL estimation and accurate dry weight (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 HD clinical settings and helps to determine patient VOL and thus to target an accurate DW.

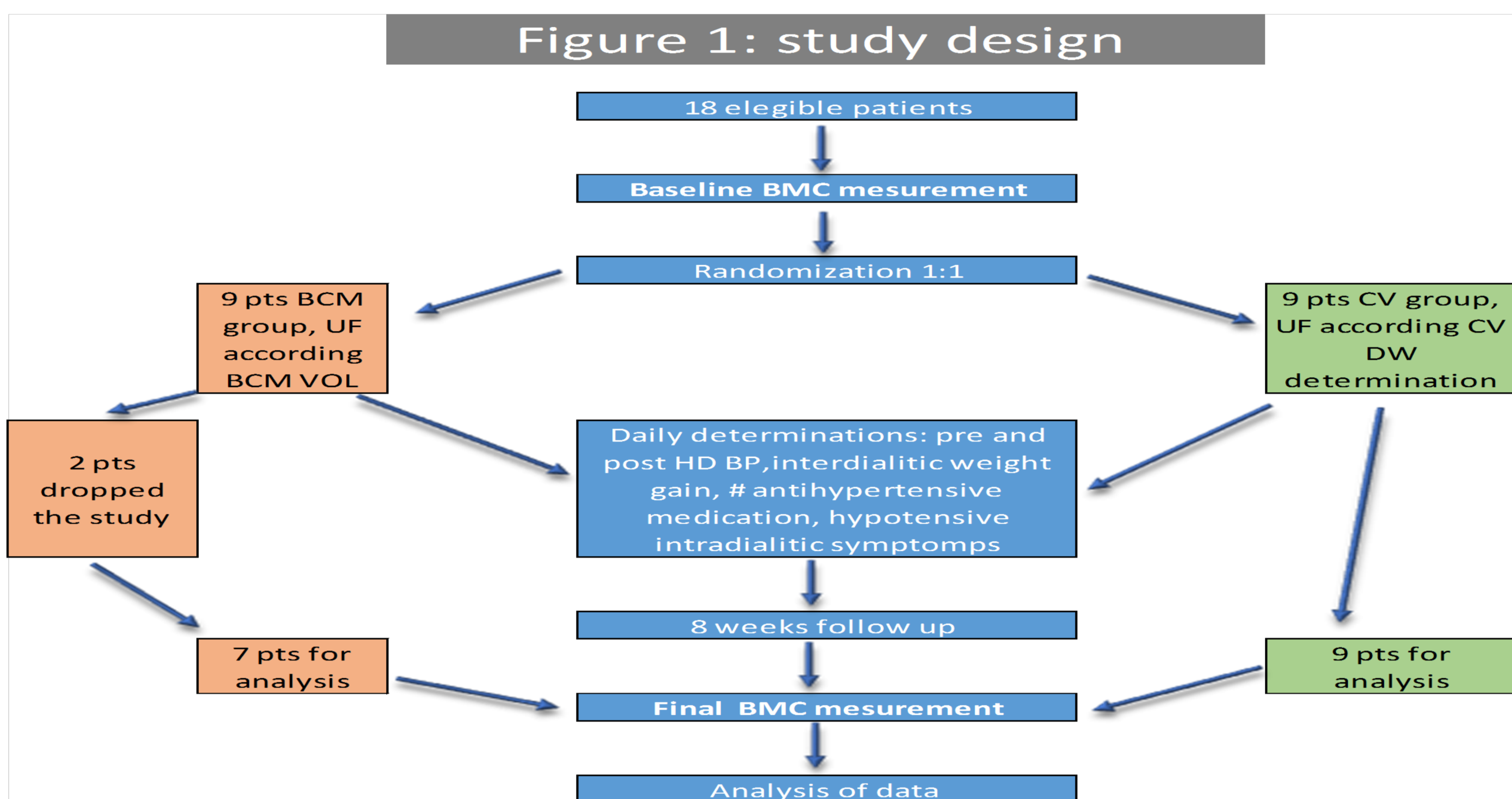
HD patients might benefit from a better systolic blood pressure (SBP) control if VOL is determined and accurate dry weight is targeted in HD treatments.

Methods

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 and intradialytic symptoms were recorded. BP was recorded at the beginning and end of each 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 patients maintained BP values <140 / 90mmHg during the HD.

Figure 1: study design



Results

Eighteen patients were included. Two patients in the BCM group abandoned the protocol (1 kidney transplant, 1 withdrawal). No difference between the groups was observed at the end of the 8 weeks regarding average SBP (BCM group 122.1 +/- 20.7 mmHg vs CV group 124.4 +/- 26.9 mmHg (p = 0.85)). However, when baseline and final SPB were compared within each group, the BCM group had a statistically significant decrease in the SBP (p = 0.004), while the CV group didn't (p = 0.22) (Figure 2). 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 patients (22%) in the CV group (p=0.59, RR 1.59 (0.49-5.08)).

Figure 2: Baseline and final average BP between groups

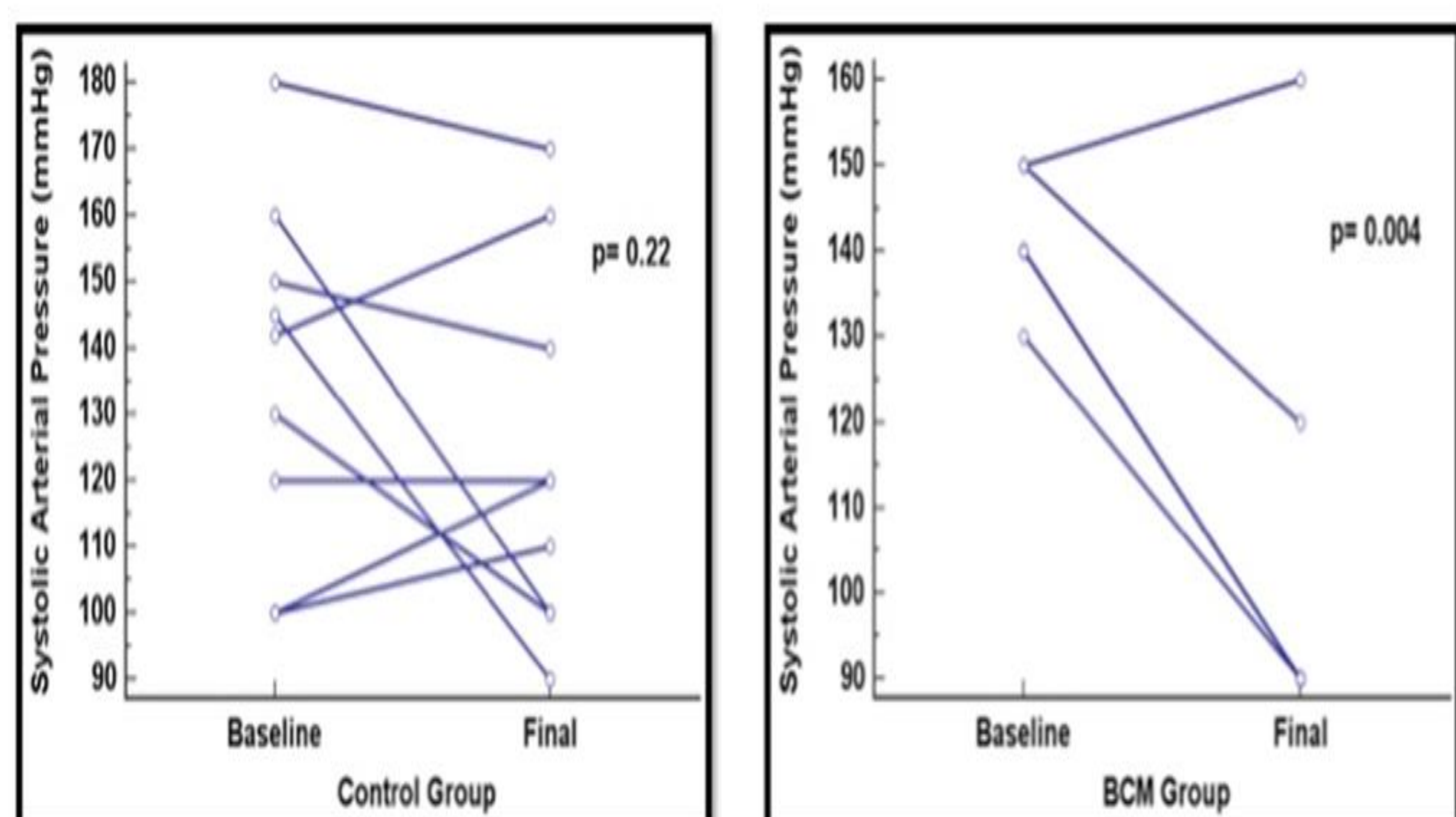


Table 1: Patients characteristics

Table 1	All n=16	CV group n=9	BCM group n=7	p
Age (y)	41	46± 3	36± 4	
Male, (%)	6 (37.5%)	7 (77%)	5 (71%)	0.35
HD vintage (y)	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 3: Baseline and final average SBP between groups

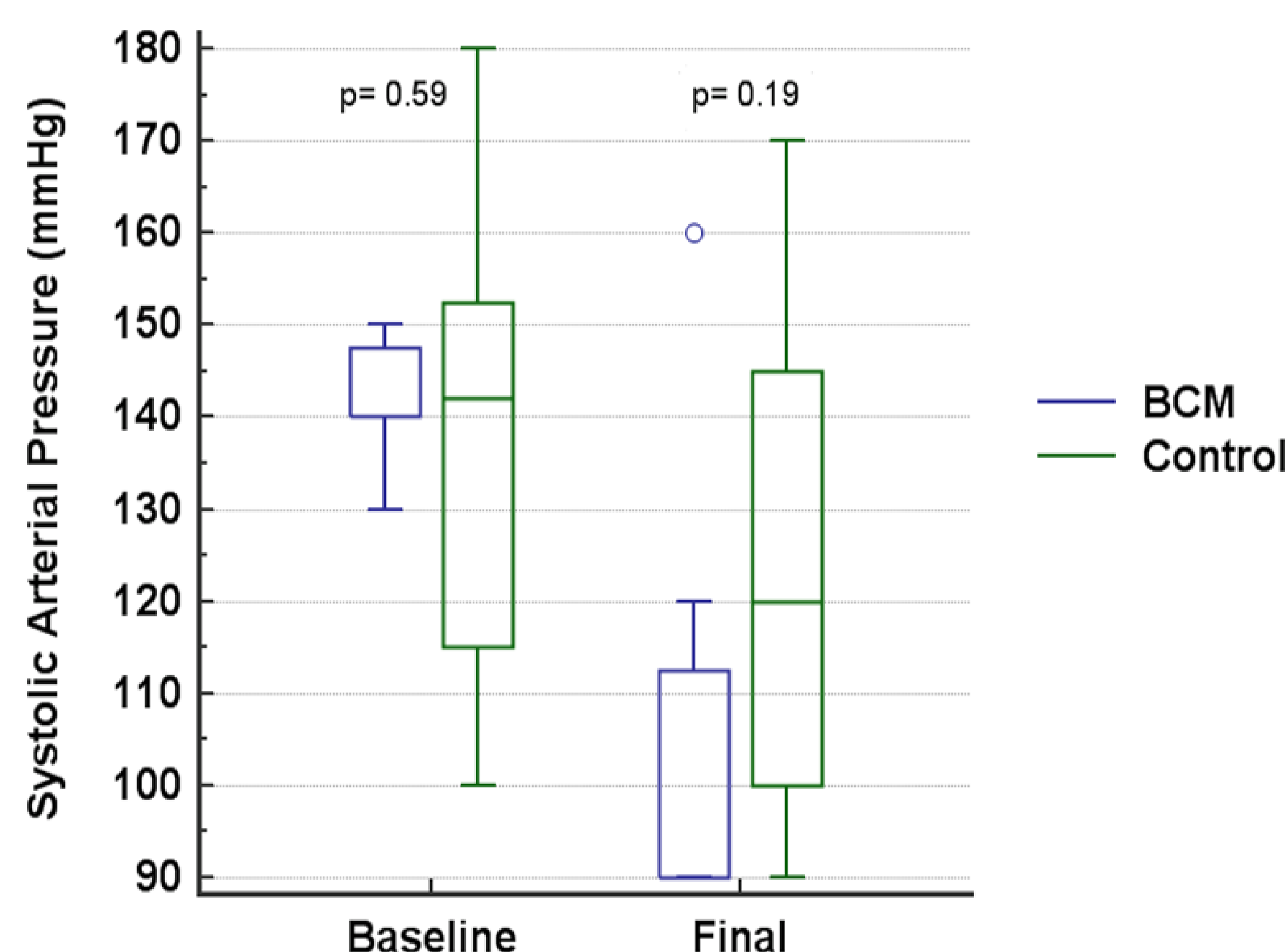


Table 2 : Baseline and final characteristics

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 sANP, (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 n %)	4 (25%)	0	4 (57.5%)	0.25 (0.09-0.66)	0.002*

Conclusions

With the use of BMC to target accurate DW, more HD patients achieved a SBP <140mmHg and decreased the use of antihypertensive drugs without significant adverse effects.

A longer follow up and a largest group of patients is needed to assess these findings in the daily clinical setting.

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