

Self-measurement of blood pressure at home reduces the need for anti-hypertensive drugs.

A Randomized, controlled trial

55 yo female with a 10-year history of hypertension presents in the FCC IM COC clinic. She is compliant with her BP medication (Lisinopril 10 mg p.o daily) and checks her BP at home. She keeps a log of her BP readings at home. Daily morning BP readings for the past 3 consecutive days: 135/78, 130/76, 132/72. However, her BP at the clinic reads : 138/83. At her last clinic visit about 2 months ago, her office and home BP readings were quite similar to the above and no interventions were made. Lab test today: No micro-albuminuria. What do you recommend?

Article search:

Using PubMed and the search terms: "home BP monitoring", I reviewed articles between 2010-2005.

Study: Multicenter, prospective, randomized, double-blind trial with parallel group design.

Research Question: Whether treatment decisions based on home BP measurements can lead to reduction in the use of antihypertensive drugs and the associated costs, compared to office BP measurements

Population: 430 adult subjects with mild to moderate hypertension.

Intervention: Home BP monitoring

Comparison/control: Office BP monitoring and 24-hour ambulatory BP monitoring

Outcomes: *Clinical/Functional:* No significant difference in self-BP vs office BP monitoring values (1.6/1.0 mmHg, $p=0.25/0.20$), no significant change in left ventricular mass index ($-6.5\text{g}/\text{m}^2$ vs $-5.6\text{g}/\text{m}^2$ $p=0.72$) or in median urinary micro-albumin concentration (-1.7 vs $-1.5\text{ mg}/24\text{ hr}$ $p=0.87$)

Economic: Lower costs with self BP monitoring vs office BP (\$ 3222 vs \$4420 per 100 patients/month)

Importance of the research question: With rising cost of healthcare, more patients without insurance, the relevance of self BP monitoring in reducing unnecessary medication prescription can lead to cost savings, maintain adequate BP control and not facilitate target organ damage.

Critical Appraisal:

Baseline characteristics: Both groups were similar at baseline wrt % males, age, BMI, glucose level, cholesterol, kidney function, micro-albumin and treatment status.

Assignment of patients to treatment: Randomized, double-blind

Treatment of groups: Both groups were treated equally with washout, pre- and post- 24-hour ABP and assessment of target-organ damage

Analysis: All subjects were accounted for, intention-to-treat analysis performed. Drop-out rate 10.02% (46 subjects). Adverse event was reported in only 1 subject. Medication compliance was similar in both groups (87.3% in self- BP group vs 88.1% in office-BP group)

Follow-up: Compliance with self-home BP monitoring prior to each visit was 92.8% (39/42)

Results:

Over a 1 year period, 10.7 vs 1.9% (SP vs OP) subjects could permanently stop their medications. No significant difference between groups was seen for either SBP or DBP at the post-trial office BP ($p=0.25$, $p=0.20$ respectively). SP group had lower treatment cost vs OP group ($p<0.001$). However, the post-trial 24-hour ABP was higher in the SP group vs OP group ($p<0.05$)

Applicability:

Much benefit is to be derived from the correct application of home BP monitoring. Recommended monitoring needs to be done both in the morning and evening to avoid missing diurnal fluctuations in BP. 24-hour ambulatory BP monitoring has the benefit of detecting diurnal dipping, non-dippers and extreme dippers which have prognostic values. The AHA recommends HBPM should become a routine component of BP measurement in most patients with known or suspected hypertension. Recommended target HBPM goal for treatment is $<135/85$ mmHg or $<130/80$ mmHg in high-risk patients¹.

1. Pickering TG, Miller NH, Oggedegbe G, Krakoff LR, Artinian NT, Goff D: Society of Hypertension, and Preventive Cardiovascular Nurses Association. A Joint Scientific Statement From the American Heart Association, American. Call to Action on Use and Reimbursement for Home Blood Pressure Monitoring *Hypertension*. 2008;52:000-000