Published in final edited form as:
Lancet. 2010 July 17; 376(9736): 144–146. doi:10.1016/S0140-6736(10)61050-1.

Self-titration for treatment of uncomplicated hypertension

Gbenga Ogedegbe
Center for Healthful Behavior Change, Division of General Internal Medicine, Department of Medicine, New York University School of Medicine, New York NY 10010, USA

Gbenga Ogedegbe: olugbenga.ogedegbe@nyumc.org

Self-titration of prescribed medications is widely accepted for the management of patients with asthma[1] and diabetes mellitus,[2] and for patients who require chronic anticoagulation.[3] Two important developments in blood pressure measurement make self-titration appealing for the treatment of hypertension—the ubiquitous use of automated home blood pressure monitoring devices,[4] and the availability of telemonitoring capability with reliable transfer of patients' data to primary care practices.[5] So far, only two studies have assessed self-monitoring of blood pressure in combination with self-titration of antihypertensive drugs as a strategy for treatment of hypertension.[6,7]

The Telemonitoring and Self-Management of Hypertension Trial (TASMINH2) published in *The Lancet* today[8] advances our knowledge of the role of self-titration in the treatment of hypertension. Among 527 patients enrolled in TASMINH2, Richard McManus and colleagues assessed whether self-monitoring of blood pressure plus self-titration of antihypertensive drugs would significantly reduce systolic blood pressure at 6 months and 12 months, compared with usual care. Patients in the intervention group were instructed to take two self-measurements of blood pressure every morning for 1 week, each month. If the average weekly readings were above target on 2 consecutive months, patients were required to adjust their medications according to prespecified titration schedules that were agreed upon by them and their family doctors. A month was deemed to be "above target" if the readings on 4 or more days were above 130/85 mm Hg for those without diabetes, and 130/75 mm Hg for those with diabetes. Patients were asked to contact their family doctor or the research team if their blood pressure readings exceeded the safety limit of 200/100 mm Hg or if their systolic blood pressure was less than 100 mm Hg. When the patient had not contacted the research team despite blood pressure readings that were outside the safety limits (based on telemonitored readings), the research team contacted such patients by telephone. The intervention resulted in substantially lower systolic blood pressure than did usual care, by 3·7 mm Hg at 6 months and by 5·4 mm Hg at 12 months. The blood pressure reduction was associated with greater medication adjustment in the intervention group than in the control group. The side-effects profile was similar for both groups, apart from leg swelling (32% [74/234] in the intervention group *vs* 22% [55/246] in the control group, p=0·022).

Several aspects of TASMINH2 deserve mention. First, it is the only study to assess the effect of combined blood pressure telemonitoring plus self-titration in primary care practices. The advancement in health information technology makes dissemination of this strategy into primary care practices quite feasible. Second, the patient population was carefully chosen to incorporate those who had failed treatment with at least one antihypertensive drug but were taking fewer than three medications. This strategy is clever because it targets most of those patients with poorly controlled hypertension,[9] and it

I declare that I have no conflicts of interest.

excludes patients with resistant hypertension who might need much closer monitoring and evaluation for secondary causes of hypertension. Finally, unlike other self-monitoring trials, the study duration of 12 months in TASMINH2 allowed adequate assessment of the self-titration strategy in patients with uncomplicated hypertension.

Findings from TASMINH2 could profoundly affect the way we treat patients with uncomplicated hypertension. However, before we take such a leap, three issues must be addressed. First, what constitutes the optimum duration of self-monitoring and self-titration schedules that would yield improved outcomes? The titration schedules used in TASMINH2 were not based on any known evidence. An assessment of the dose-response relation between self-titration and blood pressure reduction in this study would provide initial evidence in this direction. Second, what is the minimum follow-up period before patients are deemed uncontrolled and recommended for self-titration? Should this strategy be recommended for all newly diagnosed patients who recently initiated antihypertensive treatment? Identification of subgroups of patients in whom this strategy would be most effective should address this issue. Unfortunately, TASMINH2 was not powered to identify such subgroups. Finally, what are the cost implications of this strategy? In some countries, such as the USA, provider reimbursement and pay for performance are largely based on office blood pressure readings and not home blood pressure readings. Although not reported, the investigators undertook a cost-effectiveness analysis with the goal of outlining the cost drivers of combined self-titration plus home blood pressure telemonitoring. Such data should provide reassurance to policy makers and insurers on the need to reimburse family doctors for use of self-monitoring devices and adoption of self-titration strategies similar to reimbursement for blood glucose monitors.

Although findings of the TASMINH2 trial suggest that self-titration of antihypertensive drugs has come of age in terms of its feasibility, safety, and efficacy, its widespread dissemination into primary care practices might be premature until these findings are replicated by other investigators, especially in low-income, low-literate patients who receive care in low-resource, non-academic settings. While we await the findings from two studies that are currently investigating these issues,[10,11] the future of telemonitoring plus self-titration as a practice-based strategy for management of patients with uncontrolled hypertension is not far off on the horizon.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

My work is supported by funding from the National Institutes of Health (R01 HL078566 and R01 HL087301).

References

1. Powell H, Gibson PG. Options for self-management education for adults with asthma. Cochrane Database Syst Rev. 2003; 1:CD004107. [PubMed: 12535511]
2. Clar C, Barnard K, Cummins E, Royle P, Waugh N. Self-monitoring of blood glucose in type 2 diabetes: systematic review. Health Technol Assess. 2010; 14:1–140.
3. Levi M. Self-management of anticoagulation. Expert Rev Cardiovasc Ther. 2008; 6:979–985. [PubMed: 18666848]
4. Pickering TG, Miller NH, Ogedegbe G, Krakoff LR, Artinian NT, Goff D. Call to action on use and reimbursement for home blood pressure monitoring: a joint scientific statement from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association. Hypertension. 2008; 52:10–29. [PubMed: 18497370]

5. Pare G, Jaana M, Sicotte C. Systematic review of home telemonitoring for chronic diseases: the evidence base. J Am Med Inform Assoc. 2007; 14:269–277. [PubMed: 17329725]

6. Bobrie G, Postel-Vinay N, Delonca J, Corvol P. Self-measurement and self-titration in hypertension: a pilot telemedicine study. Am J Hypertens. 2007; 20:1314–1320. [PubMed: 18047923]

7. Zarnke KB, Feagan BG, Mahon JL, Feldman RD. A randomized study comparing a patient-directed hypertension management strategy with usual office-based care. Am J Hypertens. 1997; 10:58–67. [PubMed: 9008249]

8. McManus RJ, Mant J, Bray EP, et al. Telemonitoring and self-management in the control of hypertension (TASMINH2): a randomised controlled trial. Lancet. 2010 published online July 8.

9. Hyman DJ, Pavlik VN. Characteristics of patients with uncontrolled hypertension in the United States. N Engl J Med. 2001; 345:479–486. [PubMed: 11519501]

10. Bennett H, Laird K, Margolius D, Ngo V, Thom DH, Bodenheimer T. The effectiveness of health coaching, home blood pressure monitoring, and home-titration in controlling hypertension among low-income patients: protocol for a randomized controlled trial. BMC Public Health. 2009; 9:456. [PubMed: 20003300]

11. Bosworth HB, Olsen MK, McCant F, et al. Hypertension Intervention Nurse Telemedicine Study (HINTS): testing a multifactorial tailored behavioral/ educational and a medication management intervention for blood pressure control. Am Heart J. 2007; 153:918–924. [PubMed: 17540191]

Science Photo Library

1. .