Hypertension: time for doctors to switch the driver's seat?

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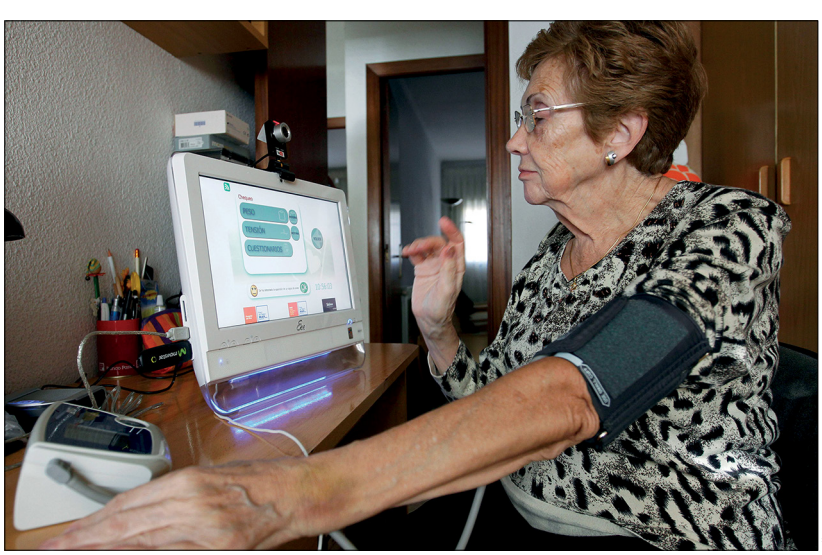
In *The Lancet*, Richard McManus and colleagues[1] in the TASMINH4 trial address a timely and clinically relevant question, as to whether self-monitoring of blood pressure, with or without telemonitoring, when used by general practitioners (GPs) to titrate antihypertensive therapy in individuals with poorly controlled blood pressure, leads to significantly lower blood pressure than titration guided by clinic readings alone.

In their unmasked, randomised controlled trial in 142 UK general practices, hypertensive patients older than 35 years taking no more than three antihypertensive agents with blood pressure higher than 140/90 mm Hg were assigned to self-monitoring using an automated electronic sphygmomanometer (n=395), telemonitoring with patients sending blood pressure readings via a simple free SMS text-based telemonitoring service with web-based data entry back-up (n=393), or to usual care (n=394). 1003 (85%) of these patients were included in the primary analysis and the primary outcome was clinic measured systolic blood pressure at 12 months from randomisation. Compared with usual care, the decrease in clinic measured systolic blood pressure at 12 months in patients in both self-monitoring groups was clinically meaningful (self-monitoring 137·0 [SD 16·7] mm Hg and telemonitoring 136·0 [16·1] mm Hg *vs* usual care 140·4 [16·5] mm Hg; adjusted mean differences *vs* usual care: self-monitoring alone −3·5 mm Hg [95% CI −5·8 to −1·2]; telemonitoring −4·7 mm Hg [−7·0 to −2·4]). If sustained, such reductions in blood pressure could be expected to reduce stroke risk by 20% and coronary heart disease risk by 10%.

These results might seem unsurprising, but it is easy to forget that we lack a critical mass of randomised data showing whether correctly implemented self-monitoring, generating results on which physicians will titrate therapy, can result in better blood pressure control.[2] As such, these results are important and reassuringly validate current clinical practice, as already applied to many individuals with hypertension worldwide.[3] Although certainly not yet the norm, increasingly in many practices, patients bring in a more or less structured set of self-monitored blood pressure measurements on which physicians often base their therapeutic actions.

According to McManus and colleagues, it is the differential intensification by the GPs of antihypertensive medication in response to the patients' input signals of self-monitored blood pressure that is the mechanism involved in the better blood pressure decrease in the self-monitoring groups—an effect that requires the action, time, and attention of a medically trained individual. But does it need to be so? It should be noted that in the TASMINH2[4] and TASMIN-SR[5] trials using telemonitoring and self-titration by the patient, the blood pressure drop was of roughly similar magnitude as in this trial.

There are some limitations to this otherwise excellent trial. First, the trial was designed before starting with combination antihypertensive therapy was the norm.[6] It is a matter of debate whether blood pressure reductions would be successful to the same degree if GPs had to start their efforts in patients with poorly controlled blood pressure who were using more than two or three antihypertensive drugs. Second, would addition of ambulatory blood pressure data—left out for reasons of feasibility—have yielded additional insights? Third, the addition of telemonitoring in this trial on top of self-monitoring resulted in a non-significantly larger but more rapid decrease in blood pressure. The by-design unobtrusive nature of the intervention (SMS reminders to measure blood pressure and a fairly easy way to present results and alerts to the GP and patient) might have nullified a potential significant effect. Blood pressure control could have benefited from a more stringent and compulsory telemonitoring-aided intervention



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urging both patient and GP towards a next mandatory step-up in therapy.

Thus, in the TASMINH4[1] study the physician was in the driver's seat to either ignore the patient's input signal or to re-evaluate the installed therapy. This approach seemed to work, although it is questionable whether this strategy will remain equally effective in the foreseeable future when doctors get overwhelmed by a deluge of such digital health signals.

With increasing use of digital medicine, physicians are facing the early stages of a change in clinical practice, ranging from emails and social media messages from patients to automatically transmitted data from a plethora of wearables or connected point-of-care devices (eg, for blood pressure, glycaemia, N-terminal pro b-type natriuretic peptide, heart rhythms, and therapeutic drug monitoring) or from implantable devices (eg, defibrillators and pacemakers), which will be transmitted to doctors (including GPs) for medical advice, with expectations of direct medical scrutiny and therapeutic reactions if required.[7] Although these changes are useful for advancing daily clinical practice and likely beneficial for the patients, this massive inflow of data, often using proprietary formats and requiring separate dedicated (manufacturer-specific) software platforms, is already starting to put a strain on the medical community. In many countries and health-care systems, there is neither clear technical regulatory guidance for e-health interventions nor properly defined legal responsibilities. Moreover, the necessary structural reimbursement or person power to support doctors is lacking in most settings.

Surely, it is time for care providers to rethink the chain of medical decision taking in hypertension management? Should not the driver's seat be co-chaired by health literate patients and dedicated professionals from allied fields? Could it be a valuable option to empower patients whenever possible, introducing them to self-titration and self-initiation of antihypertensive drug therapy? Such an option would be controversial and not devoid of risks but could be a worthwhile and future-proof strategy.[8]

In 2016, the *Lancet* Commission on hypertension[8] launched "A call to action and a lifecourse strategy to address the global burden of raised blood pressure on current and future generations" that aimed to move beyond the current stalemate. Among other key actions, education (of patients, doctors, and the general public), empowerment, and expansion of the workforce engaged in the management of blood pressure through task sharing were seen as central.

A feasible future scenario could be GPs acting as highly educated central health-care managers who not only treat individual patients but also orchestrate community health through a digital infrastructure, designed in conjunction with the medical end-user and relying on dedicated artificial intelligence. This forward-looking strategy could be equally applicable to middle-income and low-income countries where there is often a shortage of physicians and a high burden of untreated and undiagnosed hypertension—a driver's seat allowing doctors to efficiently achieve both clinical and population outcomes. This should not be viewed as an abdication of responsibility but as an embracing of a far more wide-ranging collective responsibility.

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