Letter

Measuring outcomes of hypertension treatment in primary care in resource-limited settings

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Cardiovascular disease is the leading global cause of death,1 and hypertension is one of the major risk factors for cardiovascular disease.2 Approximately 80% of the attributable burden of hypertension is in low- and middle-income countries.3 The health systems in these countries are often under strain because of limited financial resources and historically have prioritized maternal and child health and infectious diseases over noncommunicable diseases and their risk factors, such as hypertension.4

Data from low- and middle-income countries on trends in population blood pressure distribution and on hypertension prevalence, awareness, treatment and control in representative populations over time are scarce owing to a lack of active surveillance and to poor follow-up mechanisms.5 A meta-analysis estimates that about 33% of urban and 25% of rural Indians have hypertension, and that only 25% of rural and 42% of urban Indians are aware of their hypertensive status; only 25% of rural and 38% of urban Indians with hypertension are being treated, with blood-pressure control occurring in only 11% of the rural and 20% of the urban Indian hypertensive population.6 In India, the National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke advocates screening of individuals aged more than 30 years for hypertension, as well as free treatment for patients with a confirmed diagnosis and monitoring of treatment outcomes.7 However, currently, health facilities are reporting only the number of patients diagnosed and initiated on treatment, and there is no proper system of follow-up for long-term monitoring of patients' disease status.8

Control rates, follow-up rates and complication rates are the recommended indicators for monitoring treatment of hypertension. There is a need for a system to integrate these indicators into routine reporting by primary health centres. A good monitoring system should be simple and aligned with routinely generated data. In 2016, the World Health Organization (WHO) launched the HEARTS technical package for cardiovascular disease management in primary health care.9 The HEARTS technical package comprises six modules and an implementation guide to strengthen cardiovascular disease management in primary care; it is aligned with the WHO Package of essential noncommunicable disease interventions for primary health care in low-resource settings.10 The HEARTS technical package provides guidance on outlining clear roles for health-care workers (team-based care); incorporating processes for ensuring access to core medicines and technology (access to essential medicines and technology); strengthening referral mechanisms to secondary and tertiary levels of care (evidence-based treatment protocols); and developing patient monitoring systems and preparing for future impact evaluations based on patient outcomes (systems for monitoring). Indicators recommended by HEARTS for monitoring hypertension include treatment initiation rate, control rate, cumulative control rate, follow-up examination rate and complications rate.11 According to the HEARTS technical package, patients’ hypertension control should be recorded at a post-registration time point of 6–9 months, depending on the local context, and then annually thereafter. Health facilities should produce quarterly reports on the proportion of patients whose blood pressure is controlled at 6–9 months and annually after treatment initiation.

This letter reports on a simple tool for calculating indicators for monitoring hypertension, which is based on the treatment card suggested by HEARTS. The tool was used to estimate the control rates of patients with hypertension attending an urban clinic. The aim of the letter is to provide information on the feasibility of tracking hypertension treatment, control and follow-up rates in low-resource settings using existing resources.

Developing the tool

A tool was created in Microsoft Excel containing the variables required to generate hypertension indicators and other variables.12 Patients’ data are to be entered at the time of registration and on follow-up visits. At the time of registration, patients’ identification, demographic and clinical history details are to be entered from the data source, which could be a treatment card or noncommunicable disease register. Systolic blood pressure and diastolic blood pressure, collected at monthly visits, and information on the occurrence of new complications are entered in separate columns. If the blood-pressure data for a patient are not available for a particular month, then “999” is entered. Data entry errors, such as improper cell references, were expected to be a major problem for this Excel-based tool. Therefore, precautions were taken to restrict erroneous data entry; editing of cells, rows, columns and sheets was disabled and only numbers could be entered in the columns recording blood pressure.

Longitudinal records of the hypertension control status of individual patients can be stored for many years. In addition, facility-level reports showing 3-month, 6-month and annual control rates and rates of loss to follow-up can be generated.
automatically. The tool also makes it possible to calculate annual complication rates for coronary artery disease, stroke, nephropathy, retinopathy and lower limb amputation.

Testing the tool

Data from patients attending the Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) Urban Health Centre in Pondicherry were used. The centre is run by the Department of Preventive and Social Medicine, JIPMER, Puducherry, India. It provides holistic care to around 9000 people in four urban wards. The centre’s workforce comprises a medical officer, senior resident, junior residents, interns and other health-care providers, as per the Indian Public Health Standards for primary health centres.13 There is a dedicated weekly noncommunicable disease clinic that offers consultation, investigation and free pharmacological and nonpharmacological treatment to registered patients. Patients’ blood pressure is measured and recorded at every visit. Patient-related data are collected at the facility as a routine activity and are also routinely collated to generate reports to be sent to the higher level. Consequently, ethical clearance was not required to collect the relevant data. However, strict confidentiality was maintained and all personal identifiers were stripped out before analysis.

Data from patients who were on treatment for hypertension from January to July 2017 were entered into the Excel tool and outcome indicators were calculated. The control rate was defined as the proportion of patients registered with the facility for treatment of hypertension with blood pressure lower than 140/90 mm Hg. For the purposes of this test, facility control rates were calculated at 3 and 6 months after treatment initiation; loss to follow-up rates were defined as the proportion of patients who did not report to the facility for monitoring at 3 months and at 6 months. Data on complications were not available. Of the 343 patients in treatment for hypertension, blood pressure control rates were 55.1% and 49.6% at 3 months and at 6 months respectively. Loss to follow-up rates were 19.0% and 19.2% at 3 months and at 6 months respectively.

Discussion

To supplement the paper-based systems common in low-resource settings, there is a need for a computerized system for recording patients’ data longitudinally. For India, phasing in of digital health records is planned for the health and wellness centres under the Ayushman Bharat initiative; these records will be interoperable with the overall eHealth architectures planned at the state and national levels.14 It is important that the tool is simple, so that anyone with a basic knowledge of computers can be trained to enter the data, which can then be used to monitor the outcomes of treatment at a health facility. Since this tool also displays the control status of each patient, it will help with the management of individual cases. As the data are stored in Excel, a text message reminder service can be introduced. This should reduce loss to follow-up and increase compliance. Since the tool makes it easy to generate indicator data for monitoring hypertension, comparisons can be made among multiple facilities. The tool can also be used to track the performance of a facility over a period of time and can be integrated with the monthly reporting mechanisms at a primary health centre. The current tool offers the option to record indicators for monitoring blood glucose and lipids. We have demonstrated the utility of the hypertension component of the tool, but there is clearly scope to expand the tool for holistic monitoring of other noncommunicable diseases in a primary health-care setting.

However, since the data source may be a treatment card, it is crucial that the treatment card is properly filled in and regularly updated. Ideally, for proper tracking of patients, the treatment card should be kept in the health facility, so that data can be entered into the computerized system at regular intervals. This will also help in identifying patients who do not return for follow-up visits. Data input errors are likely to happen, and therefore care with data entry and the implementation of a checking process are essential.

A lack of computers poses a challenge to the successful implementation of this tool in resource-poor settings. In addition, it is anticipated that patients may move from one facility to another in seeking treatment for noncommunicable diseases. Therefore, there should be strong linkages between health facilities to ensure that patients can be identified using unique numbers. Nevertheless, all the countries in the WHO South-East Asia Region have at least begun to move towards using electronic health records and digital health systems. Appropriate digital solutions are needed in different contexts, and this tool is an example of a means of bridging the paper-to-electronic transition.

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Authorship: AL developed the tool and prepared the manuscript, RAD helped in the development of the tool and prepared the manuscript, SSK and SKS collected the data and reviewed the manuscript, BN tested the tool and finalized the manuscript, and CV conceived the structure of the tool and reviewed the manuscript.


References


