SUPPLEMENTARY METHODS

Definition of vascular risk factors and baseline measurement of physiologic parameters

Hypertension was defined as a condition where the patient was prescribed antihypertensive medication or had a measured office blood pressure (BP) over 140/90 mm Hg on two separate visits. BP was measured twice in a sitting position after ten minutes of rest and the mean of the two measurements was accepted as the BP. Target BP achievement was defined as an office-measured BP at the final visit <140/90 mm Hg except for those who had diabetes or chronic kidney disease, in which case the target was <130/90 mm Hg. Diabetes mellitus was defined as fasting glucose >126 mg/dL or a history of anti-diabetic medication. For the patients who had diabetes, HbA1c was also measured, and target HbA1c achievement was defined as HbA1c <7% at the last visit. Dyslipidemia was defined as a history of receiving cholesterol-lowering medication or a low-density lipoprotein (LDL) reading over 100 mg/dL. For clarity, total cholesterol, LDL cholesterol, high-density lipoprotein cholesterol, and triglycerides were presented as measured values. Smoking status was classified as current smoker or non-smoker. For the comparisons, baseline systolic and diastolic BP, height, weight, and waist circumference were measured at the screening visit. Waist circumference was measured in a supine position at the level of the umbilicus. Target waist circumference was <35 inches in females and <40 inches in males.

Structure and installation procedure of Korea University Health Monitoring System for Stroke (KUHMS2)

Because the purpose of this study was to test the feasibility of using mobile-based applications for the care of patients with stroke, a mobile application was developed and used for the acquisition of data. The application has a menu for hypertension, blood sugar, abdominal circumference, smoking, exercise, weight, and medication adherence under the name of ‘Korea University Health Monitoring System for Stroke: KUHMS2’ (Supplementary Fig. 1). After screening for eligibility and obtaining informed consent, the study coordinator installed KUHMS2 and set the configuration on each patient’s smartphone. Because KUHMS2 has a function that can customize the menu for each patient, each patient set his menu according to his own the vascular risk factors. All patients were educated in the use of KUHMS2 and provided with an instruction manual for it. Each patient received a home BP monitor system (Omron HEM-7203, Omron Healthcare, Kyoto, Japan) and tape measure. The patients were instructed to enter their BP data and waist circumference into the application every day and to measure BP in a sitting posture at early morning after at least ten minutes of rest. Patients who had diabetes were instructed to test their blood sugar four times a day: before breakfast, two hours after breakfast, at 3 p.m. (before dinner), and at 9 p.m. Smoking was measured as the number of cigarettes used per day. Physical exercise was checked if the patient had taken moderate-intensity exercise that day. Drug adherence was checked if the patients took pills according to prescription. KUHMS2 has a function that can send an alarm message to the user and administrator when the registered data value exceeds a pre-defined threshold (i.e., BP, SBP <90 or >160 mm Hg, DBP <60 or >120 mm Hg; blood sugar <70 mg/dL or >350 mg/dL).

All the data registered on KUHMS2 were collected by the server at Data Mining & Information Systems Laboratory via wireless mobile internet. If the registered data exceeded a predefined level, an automated alarm message was sent to the user. The patient could view their accumulated personal data on a web page.

All patients were requested to visit the outpatient clinic at 90 and 180 days from the time of the baseline measurements and were retested for BP, waist circumference, weight, and height. The information registered to the application was retrieved by the attending physician at regular clinic visits for prescription renewal.

REFERENCES