2017-09-01

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The Lancet 2

Availability and affordability of blood pressure-lowering medicines and the effect on blood pressure control in high-income, middle-income, and low-income countries: an analysis of the PURE study data

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Background

Hypertension is considered the most important risk factor for cardiovascular diseases, but its control is poor worldwide. We aimed to assess the availability and affordability of blood pressure-lowering medicines, and the association with use of these medicines and blood pressure control in countries at varying levels of economic development.

Methods

We analysed the availability, costs, and affordability of blood pressure-lowering medicines with data recorded from 626 communities in 20 countries participating in the Prospective Urban Rural Epidemiological (PURE) study. Medicines were considered available if they were present in the local pharmacy when surveyed, and affordable if their combined cost was less than 20% of the households' capacity to pay. We related information about availability and affordability to use of these medicines and blood pressure control with multilevel mixed-effects logistic regression models, and compared results for high-income, upper-middle-income, lower-middle-income, and low-income countries. Data for India are presented separately because it has a large generic pharmaceutical industry and a higher availability of medicines than other countries at the same economic level.

Findings

The availability of two or more classes of blood pressure-lowering drugs was lower in low-income and middle-income countries (except for India) than in high-income countries. The proportion of communities with four drug classes available was 94% in high-income countries (108 of 115 communities), 76% in India (68 of 90), 71% in upper-middle-income countries (90 of 126), 47% in lower-middle-income countries (107 of 227), and 13% in low-income countries (nine of 68). The proportion of households unable to afford two blood pressure-lowering medicines was 31% in low-income countries (1069 of 3479 households), 9% in middle-income countries (5602 of 65 471), and less than 1% in high-income countries (44 of 10 880).

Participants with known hypertension in communities that had all four drug classes available were more likely to use at least one blood pressure-lowering medicine (adjusted odds ratio [OR] 2·23, 95% CI 1·59–3·12); p<0·0001), combination therapy (1·53, 1·13–2·07; p=0·054), and have their blood pressure controlled (2·06, 1·69–2·50; p<0·0001) than were those in communities where blood pressure-lowering medicines were not available. Participants with known hypertension from households able to afford four blood pressure-lowering drug classes were more likely to use at least one blood pressure-lowering medicine (adjusted OR 1·42, 95% CI 1·25–1·62; p<0·0001), combination therapy (1·26, 1·08–1·47; p=0·0038), and have their blood pressure controlled (1·13, 1·00–1·28; p=0·0562) than were those unable to afford the medicines.

Interpretation

A large proportion of communities in low-income and middle-income countries do not have access to more than one blood pressure-lowering medicine and, when available, they are often not affordable. These factors are associated with poor blood pressure control. Ensuring access to affordable blood pressure-lowering medicines is essential for control of hypertension in low-income and middle-income countries.

Funding

Population Health Research Institute, the Canadian Institutes of Health Research, Heart and Stroke Foundation of Ontario, Canadian Institutes of Health Research Strategy for Patient Oriented Research through the Ontario SPOR Support Unit, the Ontario Ministry of Health and Long-Term Care, pharmaceutical companies (with major contributions from AstraZeneca [Canada], Sanofi Aventis [France and Canada], Boehringer Ingelheim [Germany amd Canada], Servier, and GlaxoSmithKline), Novartis and King Pharma, and national or local organisations in participating countries.

On-line Access: DOI: http://dx.doi.org/10.1016/S2468-2667(17)30141-X