

Risk of Fatal and Non-Fatal Coronary Heart Disease and Stroke Events among Adult Patients with Hypertension: Basic Markov Model Inputs for Evaluating Cost-Effectiveness of Hypertension Treatment: Systematic Review of Cohort Studies

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Abstract : Markov model, like cardiovascular disease (CVD) policy model based simulation, is being used for evaluating the cost-effectiveness of hypertension treatment. Stroke, angina, myocardial infarction (MI), cardiac arrest, and all-cause mortality were included in this model. Hypertension is a risk factor for a number of vascular and cardiac complications and CVD outcomes. Objective: This systematic review was conducted to evaluate the comprehensiveness of this model across different regions globally. Methods: We searched articles written in the English language from PubMed/Medline, Ovid/Medline, Embase, Scopus, Web of Science, and Google scholar with a systematic search query. Results: Thirteen cohort studies involving a total of 2,165,770 (1,666,554 hypertensive adult population and 499,226 adults with treatment-resistant hypertension) were included in this scoping review. Hypertension is clearly associated with coronary heart disease (CHD) and stroke mortality, unstable angina, stable angina, MI, heart failure (HF), sudden cardiac death, transient ischemic attack, ischemic stroke, subarachnoid hemorrhage, intracranial hemorrhage, peripheral arterial disease (PAD), and abdominal aortic aneurism (AAA). Association between HF and hypertension is variable across regions. Treatment resistant hypertension is associated with a higher relative risk of developing major cardiovascular events and all-cause mortality when compared with non-resistant hypertension. However, it is not included in the previous CVD policy model. Conclusion: The CVD policy model used can be used in most regions for the evaluation of the cost-effectiveness of hypertension treatment. However, hypertension is highly associated with HF in Latin America, the Caribbean, Eastern Europe, and Sub-Saharan Africa. Therefore, it is important to consider HF in the CVD policy model for evaluating the cost-effectiveness of hypertension treatment in these regions. We do not suggest the inclusion of PAD and AAA in the CVD policy model for evaluating the cost-effectiveness of hypertension treatment due to a lack of sufficient evidence. Researchers should consider the effect of treatment-resistant hypertension either by including it in the basic model or during setting the model assumptions.

Keywords : cardiovascular disease policy model, cost-effectiveness analysis, hypertension, systematic review, twelve major cardiovascular events

Conference Title : ICA 2022 : International Conference on Antihypertensives

Conference Location : Dubai, United Arab Emirates

Conference Dates : February 15-16, 2022