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Different relationships between blood pressures and clinical events in SPRINT and ACCORD-BP trial

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Topic(s):
Hypertension – Epidemiology, Prognosis, Outcome

Citation:

Introduction

SPRINT showed that intensive control of systolic blood pressure (SBP) < 120mmHg was beneficial when compared to the standard treatment (SBP <140mmHg). In contrast, ACCORD-BP trial failed to prove the benefit of intensive SBP lowering in diabetic patients. J-curve phenomenon might be the key to help understanding the different results of two trials.

Methods

SPRINT and ACCORD-BP databases were obtained via BioLINCC. Since BP changes along with the time, timing at which BP became stable after treatment were chosen at 9 months for SPRINT and 1 year for ACCORD BP. The final analytic datasets consisted of 8,787 and 4,306 event-free patients at the time of stable BP, respectively. Clinical events were defined at the primary composite endpoint for each trial. The effects of BP on clinical events were modeled using natural cubic splines in Cox regression models. Degrees of freedom of splines curves were chosen using Akaike Information Criterion.

Results

Analyzing SPRINT database, the spline-based hazard ratio (HR) curve showed a J-curve, which means lowering DBP below 77mmHg could be harmful, while SBP had a linear relationship (HR 1.13 per 10mmHg increase, 95% confidence interval [CI] 1.06~1.20, p<0.0001; Figure). In ACCORD-BP trial, no J-curve phenomenon was observed. The effect of SBP was linear and almost the same to the result of SPRINT with HR 1.13 (95% CI 1.06~1.20, p=0.0003). The relationship between DBP and clinical events was non-significant with a negative trend, which means the lower, the worse (HR 0.91, 95% CI 0.82~1.01 p=0.071).

Conclusions

Despite the different results regarding the benefit of intensive BP control, the effects of SBP on clinical events were quite similar in SPRINT and ACCORD-BP trial. Instead, differences existed in the relationships between DBP and clinical events. Understanding the meaning of different patterns of relationships including J-curve might be the key to determine the optimal BP control.
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