

Modification effect of disability profiles on the association of blood pressure and mortality among older long-term care people

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Introduction

- Evidence of the optimal blood pressure target for older people with disability in long-term care setting is limited.
- We aim to estimate the associations of blood pressure with all-cause and cause-specific mortality in older people with different profiles of disability.

Methods

- This prospective cohort study was based on the government-led long-term care insurance program in Chengdu, China, including 41,004 consecutive disabled adults aged ≥ 60 years.
- BP was measured during the baseline survey by trained medical personnel using electronic sphygmomanometers. Disability profile was assessed using the Barthel index.
- The association between BP and mortality was analyzed with doubly robust estimation, which combined exposure model by inverse probability weighting and outcome model fitted with Cox regression. The non-linearity was examined by restricted cubic spline.
- The primary endpoint was all-cause mortality, and the secondary endpoints were cardiovascular and non-cardiovascular mortality.

Results

- The associations between SBP and all-cause mortality were close to a U-shaped curve in mild-moderate disability group (Barthel index ≥ 40), and a reversed J-shaped in severe disability group (Barthel index < 40).

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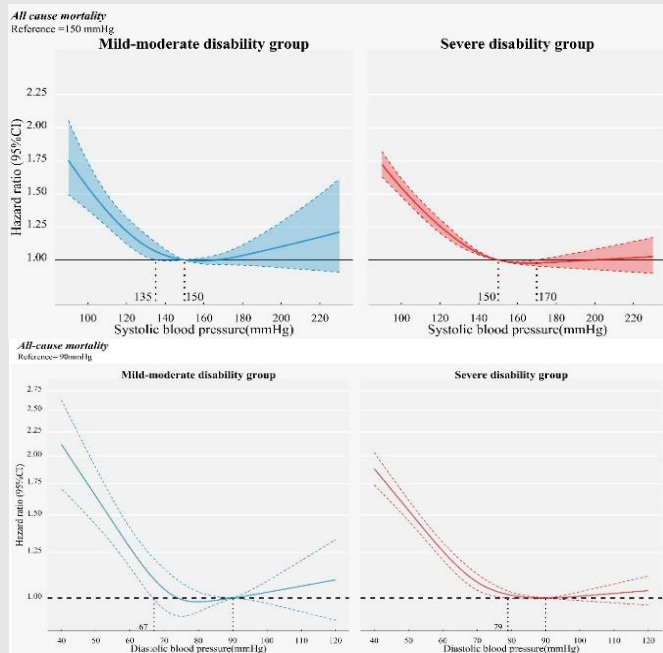


Figure 1 Cox models with cubic restricted splines of the association between BP and all-cause mortality

- In mild-moderate disability group, SBP < 135 mmHg was associated with elevated all-cause mortality risks (HR 1.21, 95% CI, 1.10-1.33), compared to SBP between 135-150 mmHg.
- In severe disability group, SBP < 150 mmHg increased all-cause mortality risks (HR 1.21, 95% CI, 1.16-1.27), compared to SBP between 150-170 mmHg.

Table 2. Association of blood pressure range with all-cause mortality risk stratified by disability status.

Blood pressure values	No. of Participants	No. of deaths	All-cause mortality		P values
			Unadjusted HR (95% CI)	Adjusted HR (95% CI)	
Mild-moderate disability group					
Systolic blood pressure, mmHg					
Lower (< 135 mmHg)	3,077	1,159	1.29 (1.17, 1.41)	1.21 (1.10, 1.33)	< 0.001
Middle (135-150 mmHg)	2,131	708	1.00	1.00	reference
Higher (> 150 mmHg)	2,927	963	0.94 (0.85, 1.03)	0.97 (0.88, 1.07)	0.521
Diastolic blood pressure, mmHg					
Lower (< 67 mmHg)	1,588	728	1.47 (1.35, 1.61)	1.29 (1.18, 1.42)	< 0.001
Middle (67-90 mmHg)	4,964	1,651	1.00	1.00	reference
Higher (> 90 mmHg)	1,583	451	0.83 (0.75, 0.93)	0.99 (0.89, 1.11)	0.927
Severe disability group					
Systolic blood pressure, mmHg					
Lower (< 150 mmHg)	24,029	11,411	1.30 (1.24, 1.36)	1.21 (1.16, 1.27)	< 0.001
Middle (150-170 mmHg)	6,070	2,487	1.00	1.00	reference
Higher (> 170 mmHg)	2,770	1,069	0.92 (0.85, 0.98)	0.95 (0.87, 1.02)	0.174
Diastolic blood pressure, mmHg					
Lower (< 79 mmHg)	19,345	9,571	1.27 (1.22, 1.32)	1.15 (1.11, 1.20)	< 0.001
Middle (79-90 mmHg)	8,771	3,653	1.00	1.00	reference
Higher (> 90 mmHg)	4,753	1,743	0.88 (0.83, 0.93)	1.00 (0.94, 1.06)	0.947

Note: HR values were shown in bold if significant difference.

- DBP < 67 mmHg (HR 1.29, 95% CI, 1.18-1.42) in mild-moderate disability group and < 79 mmHg (HR 1.15, 95% CI, 1.11-1.20) in severe disability group both demonstrated an increased all-cause mortality risk.
- The associations were robust in subgroup analyses in terms of age, gender, care model, cardiovascular comorbidity and antihypertensive treatment.

Conclusion

- The optimal BP range was higher in older people with severe disability than those with mild-moderate disability.
- This study provides new evidence for optimal individualized management of blood pressure of disabled older people in long-term care setting.

