**SUPPLEMENTAL MATERIAL**

Severe Hypertension in China:

Results from the China PEACE Million Persons Project

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**Figure S1.** Flowchart of study participant selection in China PEACE (Patient-Centered Evaluative Assessment of Cardiac Events) Million Persons Project

Participants screened at baseline

N = 2,660,666

(1,583,170 women, 1,077,496 men)

Participants screened at baseline and had blood pressure measurements

N = 2,644,548

(1,574,329 women, 1,070,219 men)

Missing blood pressure measurement at baseline

N = 16,118

(8,841 women, 7,277 men)

Participants screened at baseline, had blood pressure measurements and other covariate data

N = 2,618,757

 (1,559,488 women, 1,059,269 men)

Missing covariate data at the patient level, such as age, sex, household income, education, or BMI

N = 25,791

(14,841 women, 10,950 men)

Participants with severe hypertension

N = 378,457

(219,862 women, 158,595 men)

Participants without severe hypertension

N = 2,240,300

(1,339,626 women, 900,674 men)

# Figure S2. Classes of antihypertensive medications used by treated severe hypertensive adults

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | F |
| A | 30,260 (29.93%) | 1,832 (1.81%) | 8,199 (8.11%) | 3,521 (3.48%) | 388 (0.38%) |
| B |  | 6,691 (6.62%) | 2,811 (2.78%) | 504 (0.50%) | 106 (0.10%) |
| C |  |  | 56,144 (55.54%) | 1,592 (1.57%) | 680 (0.67%) |
| D |  |  |  | 9,676 (9.57%) | 153 (0.15%) |
| F |  |  |  |  | 9,428 (9.33%) |

The numbers in each cell represent the number (N) and percentage (%) of participants taking a specific drug class or combination of classes.

A: angiotensin-converting-enzyme inhibiors or angiotensin-receptor blockers; B: beta-blockers; C: calcium channel blockers; D: diuretics; F: fixed-dose combination drugs.

Note: we did not present alpha-blocker in this figure because the use of alpha-blocker was less than 0.1% among treated patients.

**Table S1.** Baseline characteristics of participants with severe hypertension, by treatment status

|  |  |  |
| --- | --- | --- |
| **Characteristics, n (%, 95% CI)** | **Untreated participants with severe hypertension** | **Participants with severe hypertension despite treatment** |
| N (%) | 222589 (58.8%) | 155868 (41.2%) |
| Age (years) |  |  |
| 35-39 | 5587 (2.5%) | 1382 (0.9%) |
| 40-44 | 14539 (6.5%) | 4483 (2.9%) |
| 45-49 | 26218 (11.8%) | 11380 (7.3%) |
| 50-54 | 36478 (16.4%) | 21561 (13.8%) |
| 55-59 | 32742 (14.7%) | 23050 (14.8%) |
| 60-64 | 44195 (19.9%) | 34964 (22.4%) |
| 65-69 | 36968 (16.6%) | 33969 (21.8%) |
| 70-75 | 25862 (11.6%) | 25079 (16.1%) |
| Sex |   |   |
| Men | 98232 (44.1%) | 60363 (38.7%) |
| Women | 124357 (55.9%) | 95505 (61.3%) |
| Urbanity |   |   |
| Urban | 79921 (35.9%) | 55125 (35.4%) |
| Rural | 142668 (64.1%) | 100743 (64.6%) |
| Region |   |   |
| Eastern | 78500 (35.3%) | 59567 (38.2%) |
| Western | 82289 (37%) | 50321 (32.3%) |
| Central | 61800 (27.8%) | 45980 (29.5%) |
| Education |   |   |
| Primary school or lower | 109393 (49.1%) | 83048 (53.3%) |
| Middle school | 66206 (29.7%) | 44377 (28.5%) |
| High school | 29636 (13.3%) | 19582 (12.6%) |
| College or above | 13693 (6.2%) | 7373 (4.7%) |
| Unknown\* | 3661 (1.6%) | 1488 (1%) |
| Employment |   |   |
| Employed | 163844 (73.6%) | 104014 (66.7%) |
| Unemployed | 2588 (1.2%) | 2019 (1.3%) |
| Retired | 34418 (15.5%) | 34320 (22%) |
| Housework | 17411 (7.8%) | 13574 (8.7%) |
| Unknown\* | 4327 (1.9%) | 1938 (1.2%) |
| Occupation |   |   |
| Famer | 118037 (53%) | 82777 (53.1%) |
| Nonfarmer | 100224 (45%) | 71150 (45.6%) |
| Unknown\* | 4327 (1.9%) | 1938 (1.2%) |
| Household Income (Yuan/year) |   |   |
| < 10 000 | 53341 (24%) | 36270 (23.3%) |
| 10 000-50 000 | 118115 (53.1%) | 85267 (54.7%) |
| > 50 000 | 28909 (13%) | 21729 (13.9%) |
| Unknown\* | 22224 (10%) | 12602 (8.1%) |
| Marital Status |   |   |
| Married | 204749 (92%) | 140356 (90%) |
| Widowed, separated, divorced, single | 14483 (6.5%) | 14020 (9%) |
| Unknown\* | 3357 (1.5%) | 1492 (1%) |
| Health Insurance Status |   |   |
| Insured | 217432 (97.7%) | 153207 (98.3%) |
| Uninsured | 1272 (0.6%) | 706 (0.5%) |
| Unknown\* | 3885 (1.7%) | 1955 (1.3%) |
| Medical History |   |   |
| Myocardial Infarction | 1379 (0.6%) | 2401 (1.5%) |
| Stroke | 5811 (2.6%) | 10503 (6.7%) |
| Diabetes Mellitus | 13809 (6.2%) | 23406 (15%) |
| CVD Risk Factor |   |   |
| Current smoker | 46995 (21.1%) | 28473 (18.3%) |
| Current drinker | 61986 (27.8%) | 36698 (23.5%) |
| Obesity  | 47746 (21.5%) | 46194 (29.6%) |

**Table S2.** Commonly used mediations among treated severe hypertension compared with less severe hypertension \*

\*This is calculated among participants who reported names of the medications

|  |  |
| --- | --- |
| **Less severe hypertension****(SBP between 140-159 or** **DBP between 90-99 mmHg)** | **Severe hypertension****(SBP≥160 or DBP≥100 mmHg)** |
| **Drug name** | **N (%)** | **Drug name** | **N (%)** |
| **Among adults using any medication** |
| Nifedipine  | 32772 (21.1%) | Nifedipine  | 24746 (24.5%) |
| Amlodipine  | 10813 (7.0%) | Amlodipine  | 5019 (5.0%) |
| Indapamide  | 8169 (5.3%) | Nitrendipine | 4656 (4.6%) |
| Total | 155548 (100%) | Total | 101089 (100%) |
| **Among adults using one medication** |
| Nifedipine  | 32772 (24.9%) | Nifedipine  | 24746 (28.9%) |
| Amlodipine  | 10813 (8.2%) | Amlodipine  | 5019 (5.9%) |
| Indapamide  | 8169 (6.2%) | Nitrendipine | 4656 (5.4%) |
| Total | 131585 (100%) | Total | 85639 (100%) |
| **Among adults using two medication** |
| Nifedipine and metoprolol | 1099 (5.0%) | Nifedipine and captopril | 864 (6.1%) |
| Captopril and nifedipine | 949 (4.3%) | Nifedipine and metoprolol | 799 (5.7%) |
| Nifedipine and irbesartan | 619 (2.8%) | Nifedipine and irbesartan | 457 (3.2%) |
| Total | 21890 (100%) | Total | 14117 (100%) |
| **Among adults using three medication** |
| Nifedipine, metoprolol, and irbesartan | 45 (2.3%) | Nifedipine, metoprolol, and irbesartan | 27 (2.5%) |
| Amlodipine, metoprolol, and irbesartan | 33 (1.7%) | Nifedipine, telmisartan, and metoprolol | 22 (1.8%) |
| Nifedipine, telmisartan, and metoprolol | 28 (1.4%) | Nifedipine, metoprolol, and enalapril maleate | 21 (1.7%) |
| Total | 1945 (100%) | Total | 1238 (100%) |

**Table S3.** List of 10 most commonly used traditional Chinese medications (TCM) among treated participants with severe hypertension taking TCMs

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| --- |
| **Severe hypertensive participants taking TCMs****(N=3294)** |
| Name of traditional Chinese medication | Frequency of patients n (%) |
| Zhenju Jiangya Pian | 2572 (78.1%) |
| Niuhuang Jiangya Wan | 204 (6.2%) |
| Luobuma Jiangya Pian  | 160 (4.9%) |
| Qingnao Jiangya Pian  | 75 (2.3%) |
| Luobuma Jiangya Capsule | 65 (2.0%) |
| Duzhong Jiangya Pian | 47 (1.4%) |
| Baichuan Jiangya Capsule  | 44 (1.3%) |
| Niuhuang Jiangya Pian | 22 (0.7%) |
| Jiangya Wan | 15 (0.5%) |
| Niuhuang Jiangya Capsule | 13 (0.4%) |