STROBE Statement—checklist of items that should be included in reports of observational studies

| | Item No. | Recommendation | Page No. | Relevant text from manuscript |
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| Title and abstract | 1 | (*a*) Indicate the study's design with a commonly used term in the title or the abstract | Page No. 1 | Enhanced external counterpulsation (EECP) augmentation of amlodipine in elderly patients with isolated systolic hypertension (ISH) and wide pulse pressure: A comparative study |
| | | (*b*) Provide in the abstract an informative and balanced summary of what was done and what was found | Page No. 1 | Methods: Retrospectively included 132 elderly patients with ISH and wide PP in our hospital (Mar 2022-Jun 2024). After exclusion, 120 cases were analyzed and divided into the amlodipine group and the combined group. Primary indicators include endothelin-1 (ET-1), nitric oxide (NO), systolic blood pressure (SBP), PP, systemic vascular resistance (SVR), coronary flow reserve (CFR), flow-mediated vasodilatation (FMD); secondary measures include mean arterial pressure (MAP), wall shear stress (WSS) and adverse reaction incidence. Results: After 4 courses of treatment, patients in the combined group had significantly lower rates of ET-1, SBP, PP, MAP, SVR and the incidence of adverse reactions (all $P<0.05$); NO, FMD, WSS and CFR were higher (all $P<0.05$) than in the amlodipine group. |
| Introduction | | | | |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported | Page No. 1-2 | The first four paragraphs of the Introduction |
| Objectives | 3 | State specific objectives, including any prespecified hypotheses | Page No. 2 | The final paragraph of the introduction |

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| Methods | | | | |
| Study design | 4 | Present key elements of study design early in the paper | Page No. 2 | This study retrospectively selected ISH patients admitted to Hangzhou Gongshu District People's Hospital of Integrated Traditional Chinese and Western Medicine from March 2022 to June 2024, with the aim of comparing the effect of EECP combined with amlodipine with amlodipine alone to improve hemodynamic parameters. As shown in the flow chart of the experimental design in fig. 1, a total of 132 patients' information was collected, 120 cases were analyzed after exclusion, which were categorized into a amlodipine group and a combined group in line with the treatment modality, with 60 cases in each group. |
| Setting | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | Page No. 2/5 | General information and data collection sections. |
| Participants | 6 | (*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up<br>*Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls<br>*Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants | Page No. 2 | *Inclusion criteria*: (1) patients with ISH were diagnosed by the Chinese Journal of Hypertension July 2024 publication of the Chinese Guidelines for the Prevention and Control of Hypertension (2024 Revision) written by the Chinese Guidelines for the Prevention and Control of Hypertension Revision Committee(Wang, 2025); (2) a PP difference of >70 mmHg; (3) 60 years of age or older; (4) clinical data and relevant examinations were complete.<br><br>*Exclusion criteria*: (1) with speech, mental or psychological disorders; (2) heart failure; (3) stroke; (4) moderate to severe valvular |

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| | | | | disease; (5) chronic renal dysfunction; (6) chronic liver disease; and (7) thrombotic diseases and blood diseases. |
| | | (*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed<br>*Case-control study*—For matched studies, give matching criteria and the number of controls per case | Page No. 2 | This study retrospectively selected ISH patients admitted to Hangzhou Gongshu District People's Hospital of Integrated Traditional Chinese and Western Medicine from March 2022 to June 2024, with the aim of comparing the effect of EECP combined with amlodipine with amlodipine alone to improve hemodynamic parameters. As shown in the flow chart of the experimental design in fig. 1, a total of 132 patients' information was collected, 120 cases were analyzed after exclusion, which were categorized into a amlodipine group and a combined group in line with the treatment modality, with 60 cases in each group. |
| Variables | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | Page No. 4 | Observation indicators section. |
| Data sources/ measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | *Page No. 4* | *Observation indicators section.* |
| Bias | 9 | Describe any efforts to address potential sources of bias | Page No. 5 | Propensity scores were used to control for confounding factors, with the nearest-neighbor matching method employed for propensity score matching (PSM) and a matching tolerance of 0.02. After matching, the standardized mean difference (SMD) was used to evaluate the balance of baseline characteristics between groups, where an SMD < 0.1 indicated good balance. |
| Study size | 10 | Explain how the study size was arrived at | Page No. 4-5 | The sample size of this study was determined through analysis using |

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| | | | | G*Power 3.1.9.7 computer software, aiming to identify the sample size required to detect statistically significant differences. The sample size calculation was based on the primary outcome measure of SBP. Referring to previous studies (Islam et al., 2025), a mean reduction of 20.9 mmHg in systolic blood pressure after treatment was considered clinically significant for patients aged over 55 years, with an estimated Cohen's d of 0.72. Setting the alpha level at 0.05 and statistical power at 95%, the calculation indicated that 52 patients per group were needed. Considering potential uncertainties, the final sample sizes for analysis in this study were determined as the amlodipine monotherapy group (n=60) and the combined treatment group (n=60), which we believe are sufficient to draw reliable conclusions. |

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| Quantitative variables | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why | Page No. 2 | This study retrospectively selected ISH patients admitted to Hangzhou Gongshu District People's Hospital of Integrated Traditional Chinese and Western Medicine from March 2022 to June 2024, with the aim of comparing the effect of EECP combined with amlodipine with amlodipine alone to improve hemodynamic parameters. As shown in the flow chart of the experimental design in fig. 1, a total of 132 patients' information was collected, 120 cases were analyzed after exclusion, which were categorized into a amlodipine group and a combined group in line with the treatment modality, with 60 cases in each group. |
| Statistical methods | 12 | (*a*) Describe all statistical methods, including those used to control for confounding | Page No. 5 | Statistical methods section |
| | | (*b*) Describe any methods used to examine subgroups and interactions | Page No. 5 | Statistical methods section |
| | | (*c*) Explain how missing data were addressed | Page No. 5 | Statistical methods section |
| | | (*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed<br>*Case-control study*—If applicable, explain how matching of cases and controls was addressed<br>*Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy | Page No. 5 | Statistical methods section |
| | | (*e*) Describe any sensitivity analyses | Page No. 5 | Statistical methods section |
| **Results** | | | | |
| Participants | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | Page No. 5 | In this retrospective cohort study, the patients' pretreatment characteristics were statistically analyzed and the control and combined groups were comparable, as no significant difference was found between them (Table 1). |
| | | (b) Give reasons for non-participation at each stage | Page No. 2 | This study retrospectively selected ISH patients admitted to Hangzhou Gongshu District People's Hospital of Integrated Traditional Chinese and Western Medicine from March 2022 to June 2024, with the aim of |

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| | | | | comparing the effect of EECP combined with amlodipine with amlodipine alone to improve hemodynamic parameters. As shown in the flow chart of the experimental design in fig. 1, a total of 132 patients' information was collected, 120 cases were analyzed after exclusion, which were categorized into a amlodipine group and a combined group in line with the treatment modality, with 60 cases in each group. |
| | | (c) Consider use of a flow diagram | Page No. 3 | Figure 1 |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders | Page No. 5 | ***Comparison of baseline data between the two groups***<br>In this retrospective cohort study, the patients' pretreatment characteristics were statistically analyzed and the control and combined groups were comparable, as no significant difference was found between them (Table 1). |
| | | (b) Indicate number of participants with missing data for each variable of interest | Page No. 3 | Figure 1 |
| | | (c) *Cohort study*—Summarise follow-up time (eg, average and total amount) | Page No. 2 | This study retrospectively selected ISH patients admitted to Hangzhou Gongshu District People's Hospital of Integrated Traditional Chinese and Western Medicine from March 2022 to June 2024, with the aim of comparing the effect of EECP combined with amlodipine with amlodipine alone to improve hemodynamic parameters. As shown in the flow chart of the experimental design in fig. 1, a total of 132 patients' information was collected, 120 cases were analyzed after exclusion, which were categorized into a amlodipine group and a combined group in line with |

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| | | | | the treatment modality, with 60 cases in each group. |
| Outcome data | 15* | *Cohort study*—Report numbers of outcome events or summary measures over time | *Page No. 5-7* | RESULTS section |
| | | *Case-control study*—Report numbers in each exposure category, or summary measures of exposure | *Page No. 5-7* | RESULTS section |
| | | *Cross-sectional study*—Report numbers of outcome events or summary measures | *Page No. 5-7* | RESULTS section |
| Main results | 16 | (*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | Page No. 5-7 | |
| | | (*b*) Report category boundaries when continuous variables were categorized | Page No. 5-7 | RESULTS section |
| | | (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period | Page No. 5-7 | RESULTS section |

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| Other analyses | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses | Page No. 5-7 | RESULTS section |
| **Discussion** | | | | |
| Key results | 18 | Summarise key results with reference to study objectives | Page No. 7 | In this study, SBP was reduced from baseline in both patient groups after treatment, while the combined treatment group exhibited superior control efficacy. Specific data revealed that the SBP of the control group was 132.80±8.11 mmHg post-treatment, whereas that of the combined treatment group decreased to 128.53±6.62 mmHg. The inter-group difference was statistically significant (P=0.002), with a mean difference of 4.27 mmHg..... |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias | Page No. 11 | This study has several limitations. Retrospective non-randomized grouping is prone to selection bias, as patients with severe conditions or drug intolerance may be more inclined to receive combined treatment. Although there were no statistically significant differences in baseline characteristics, confounding factors cannot be completely excluded. Elderly patients often have comorbidities such as diabetes and hyperlipidemia and take multiple medications. This study did not conduct stratified analysis to explore the impacts of these factors, nor did it collect data on lifestyle factors such as smoking and exercise, making it difficult to control related confounders. The measurement of FMD is affected by the physician's experience, equipment and patient cooperation; the detection of ET-1 and NO is |

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| | | | | interfered by sample processing factors; CFR is calculated indirectly based on ultrasound and its accuracy is lower than that of invasive examinations. All these factors may lead to measurement errors (Liang *et al*., 2024). In addition, the sample size of 120 cases from a single center is limited and the patients are mainly those with normal BMI. Thus, the results cannot be directly generalized to obese patients or those from different regions. The EECP protocol was fixed in this study and the efficacy of different parameters needs further exploration. The observation period of four treatment courses only evaluated the short-term effects. Elderly patients with ISH require long-term management, so the long-term blood pressure-lowering effect of combined treatment, its role in preventing cardiovascular events and the safety of long-term EECP use all need to be clarified through extended follow-up. Moreover, the impact of long-term patient compliance on therapeutic efficacy also deserves attention. The analysis of adverse reactions was too superficial and no detailed risk-benefit interpretation was conducted, which limits its value in clinical guidance. In the future, prospective randomized controlled studies are needed to clarify the long-term efficacy and impact on cardiovascular endpoints. It is also necessary to explore optimized EECP parameter |

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| | | | | protocols to achieve personalized treatment, conduct in-depth research on molecular mechanisms and carry out subgroup analyses targeting special populations such as those with comorbid diabetes to expand the application scope of the treatment regimen. Additionally, risk-benefit analysis of adverse reactions should be performed to improve the clinical application value, thereby contributing to the prevention and control of cardiovascular diseases in the elderly. |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | Page No. 10-11 | Discuss paragraphs 2 to 5. |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results | Page No. 11 | Discuss the final paragraph. |
| **Other information** | | | | |
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | Page No. 12 | The 2021 Gongshu District Medical and Health Science and Technology Plan Project (Grant Number: A202104). |

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

**Note:** An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.