**Online Resource for Cardiorenal Medicine Submission:**

**Elevated lung sestamibi uptake on myocardial perfusion imaging and mortality in chronic kidney disease**

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Table S1: STROBE statement

|  |  |  |  |
| --- | --- | --- | --- |
|  | Page | Item No | Recommendation |
| **Title and abstract** | 2 | 1 | (*a*) Indicate the study’s design with a commonly used term in the title or the abstract |
| 2 | (*b*) Provide in the abstract an informative and balanced summary of what was done and what was found |
|  | Introduction | | |
| Background/rationale | 4 | 2 | Explain the scientific background and rationale for the investigation being reported |
| Objectives | 4 | 3 | State specific objectives, including any prespecified hypotheses |
|  | Methods | | |
| Study design | 4-6 | 4 | Present key elements of study design early in the paper |
| Setting | 4 | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection |
| Participants | 4 | 6 | (*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up |
| n/a | (*b*)For matched studies, give matching criteria and number of exposed and unexposed |
| Variables | 5 | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable |
| Data sources/ measurement | 4-6 | 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 |
| Bias | 6 | 9 | Describe any efforts to address potential sources of bias |
| Study size | fig1 | 10 | Explain how the study size was arrived at |
| Quantitative variables | 6 | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why |
| Statistical methods | 6 | 12 | (*a*) Describe all statistical methods, including those used to control for confounding |
| 6 | (*b*) Describe any methods used to examine subgroups and interactions |
| n/a | (*c*) Explain how missing data were addressed |
| n/a | (*d*) If applicable, explain how loss to follow-up was addressed |
| 6 | (*e*) Describe any sensitivity analyses |
|  | Results | | |
| Participants | Fig1 | 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 |
|  | (b) Give reasons for non-participation at each stage |
| Fig1 | (c) Consider use of a flow diagram |
| Descriptive data | Table1 | 14\* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders |
| Table1 | (b) Indicate number of participants with missing data for each variable of interest |
| Table 3 | (c) Summarise follow-up time (eg, average and total amount) |
| Outcome data | Table 3 | 15\* | Report numbers of outcome events or summary measures over time |
| Main results | Table 3 | 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 |
| 6-8 | (*b*) Report category boundaries when continuous variables were categorized |
|  | (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period |
| Other analyses | 7 | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses |
|  | Discussion | | |
| Key results | 7-8 | 18 | Summarise key results with reference to study objectives |
| Limitations | 8 | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias |
| Interpretation | 9 | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence |
| Generalisability | 8-9 | 21 | Discuss the generalisability (external validity) of the study results |
|  | Other information | | |
| Funding | 10 | 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 |

Table S2: Baseline Characteristic by dialysis status

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **All** | **CKD-ND** | **ESKD** | **p** |
| N | 289 | 144 | 145 |  |
| Age (mean years (SD)) | 64.7 (8.27) | 66.5 (7.06) | 62.9 (8.99) | <0.001 |
| Gender = Males (N(%)) | 275 (95.2) | 136 (94.4) | 139 (95.9) | 0.774 |
| Race (N (%)) |  |  |  | <0.001 |
| African American | 155 (55.4) | 50 (36.0) | 105 (74.5) |  |
| White American | 120 (42.9) | 86 (61.9) | 34 (24.1) |  |
| Other | 5 (1.8) | 3 (2.2) | 2 (1.4) |  |
| **BMI** |  | 31.4 (5.7) | 29.4 (5.3) | 0.002 |
| **Medical History (N (%))** |  |  |  |  |
| CKD stage |  |  |  | NA |
| 3a | 98 (33.9) | 98 (68.1) | 0 (0.0) |  |
| 3b | 32 (11.8) | 34 (23.6) | 0 (0.0) |  |
| 4 and 5 | 12 (4.2) | 12 (8.3) | 0 (0.0) |  |
| ESKD | 145 (50.2) | 0 (0.0) | 145 (100.0) |  |
| Hypertension | 276 (95.5) | 131 (91.0) | 145 (100.0) | 0.001 |
| Diabetes Mellitus | 204 (70.6) | 91 (63.2) | 113 (77.9) | 0.009 |
| Congestive Heart Failure | 49 (17) | 16 (11.1) | 33 (22.8) | 0.013 |
| Prior Coronary Artery Disease | 84 (29.1) | 46 (31.9) | 38 (26.2) | 0.345 |
| History of Stroke or TIA | 36 (12.5) | 15 (10.4) | 21 (14.5) | 0.385 |
| Pulmonary Disease (COPD, Emphysema) | 65 (22.5) | 54 (37.5) | 11 (7.6) | <0.001 |
| **Medications (N (%))** |  |  |  |  |
| Dihydropyridine CCB | 110 (38.1) | 43 (29.9) | 67 (46.2) | 0.006 |
| Non-Dihydropyridine CCB (Verapamil or Diltiazem) | 7 (2.4) | 6 (4.2) | 1 (0.7) | 0.124 |
| Angiotensin Converting Enzyme Inhibitor | 103 (35.6) | 71 (49.3) | 32 (22.1) | <0.001 |
| Angiotensin Receptor Blocker | 55 (19) | 25 (17.4) | 30 (20.7) | 0.568 |
| Mineralocorticoid Receptor Blocker | 14 (4.9) | 9 (6.3) | 5 (3.4) | 0.396 |
| Beta Blocker | 179 (61.9) | 79 (54.9) | 100 (69.0) | 0.019 |
| Statins | 219 (75.4) | 110 (76.4) | 108 (74.5) | 0.811 |
| ASA | 154 (53.3) | 85 (59.0) | 69 (47.6) | 0.067 |
| Clopidogrel | 16 (5.5) | 7 (4.9) | 9 (6.2) | 0.808 |

Table S3: Stress Characteristics by chronic kidney disease stage

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **All** | **3a** | **3b** | **4 and 5** | **ESKD** | **p** |
| N | 289 | 98 | 34 | 12 | 145 |  |
| BMI (kg/m2) | 30.4 (5.6) | 31.3 (5.9) | 30.6 (4.9) | 34.6 (5.6) | 29.4 (5.3) | 0.003 |
| Days from dialysis start to stress test (mean (SD)) | NA | NA | NA | NA | 1077.46 (1352.42) | NA |
| Hemodialysis treatment <24h prior to stress test |  |  |  |  |  | <0.001 |
| NA | NA | 98 (100.0) | 34 (100.0) | 12 (100.0) | 104 (71.7) |  |
| No | NA |  |  |  | 16 (11.1) |  |
| Yes | NA |  |  |  | 25 (17.2) |  |
| Reason for Stress test (N (%)) |  |  |  |  |  | <0.001 |
| Atypical Chest Pain | 89 (30.8) | 51 (52.0) | 17 (50.0) | 3 (25.0) | 18 (12.4) |  |
| Dyspnea on Exertion | 44 (15.2) | 20 (20.4) | 5 (14.7) | 5 (41.7) | 14 (9.7) |  |
| No Reason Listed | 7 (2.9) | 2 (2.0) | 0 (0.0) | 0 (0.0) | 5 (3.4) |  |
| Other | 58 (20.1) | 19 (19.4) | 8 (23.5) | 3 (25.0) | 28 (19.3) |  |
| Pre-Operative Risk Stratification | 86 (29.8) | 4 (4.1) | 3 (8.8) | 1 (8.3) | 78 (53.8) |  |
| Typical Chest Pain | 5 (1.7) | 2 (2.0) | 1 (2.9) | 0 (0.0) | 2 (1.4) |  |
| Qualitative Result (N(%)) |  |  |  |  |  | <0.001 |
| Attenuation Artifact | 33 (11.4) | 26 (26.5) | 4 (11.8) | 2 (16.7) | 1 (0.7) |  |
| Fixed Defect/Scar | 47 (16.3) | 19 (19.4) | 9 (26.5) | 2 (16.7) | 17 (11.7) |  |
| No reversible ischemia or infarct | 163 (56.4) | 41 (41.8) | 17 (50) | 6 (50) | 99 (68.3) |  |
| Peri-infarct reversible ischemia | 10 (3.5) | 5 (5.1) | 0 (0.0) | 0 (0.0) | 5 (3.4) |  |
| Reversible ischemia | 36 (12.5) | 7 (7.1) | 4 (11.8) | 2 (16.7) | 23 (15.9) |  |
| Location N (%) |  |  |  |  |  | 0.01 |
| Anterior | 14 (12.0) | 5 (8.8) | 2 (11.8) | 2 (50.0) | 5 (12.8) |  |
| Anterolateral | 9 (7.7) | 0 (0.0) | 1 (5.9) | 0 (0.0) | 8 (20.5) |  |
| Anteroseptal | 9 (7.7) | 8 (14.0) | 0 (0.0) | 0 (0.0) | 1 (2.6) |  |
| Apex | 12 (10.3) | 5 (8.8) | 2 (11.8) | 0 (0.0) | 5 (12.8) |  |
| Inferior | 51 (43.6) | 31 (54.4) | 10 (58.8) | 1 (25.0) | 9 (23.1) |  |
| Inferolateral | 15 (12.8) | 6 (10.5) | 1 (5.9) | 1 (25.0) | 7 (17.9) |  |
| Lateral | 5 (4.3) | 2 (3.5) | 0 (0.0) | 0 (0.0) | 3 (7.7) |  |
| Septal | 2 (1.7) | 0 (0.0) | 1 (5.9) | 0 (0.0) | 1 (2.6) |  |
| Quantitative Results (mean (SD)) |  |  |  |  |  |  |
| SSS | 5.39 (6.97) | 4.54 (6.55) | 7.00 (9.29) | 4.17 (4.11) | 5.68 (6.78) | 0.274 |
| SRS | 2.98 (5.88) | 2.34 (5.88) | 4.06 (8.16) | 2.25 (2.96) | 3.22 (5.42) | 0.435 |
| SDS | 2.16 (2.44) | 1.97 (1.92) | 2.59 (3.28) | 1.75 (2.30) | 2.23 (2.55) | 0.556 |
| TID | 0.98 (0.11) | 0.98 (0.10) | 0.98 (0.12) | 0.95 (0.11) | 0.98 (0.11) | 0.719 |
| EF | 0.54 (0.12) | 0.58 (0.12) | 0.54 (0.13) | 0.56 (0.14) | 0.52 (0.12) | 0.013 |
| LHR | 0.31 (0.09) | 0.31 (0.08) | 0.29 (0.04) | 0.31 (0.08) | 0.32 (0.10) | 0.402 |

Table S4: Outcomes:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **ALL** | **CKD-ND** | **ESKD** | **p** |
| N | 289 | 144 | 145 |  |
| Primary Outcome | 67 (23.2) | 35 (24.3) | 32 (22.1) | 0.756 |
| Mortality | 52 (18) | 26 (18.1) | 26 (17.9) | 1 |
| Hospitalization for MI/UA | 6 (2.1) | 4 (2.8) | 2 (1.4) | 0.674 |
| Revascularization | 12 (4.2) | 8 (5.6) | 4 (2.8) | 0.37 |
| Number of Days to event (mean days (SD)) |  |  |  |  |
| Primary outcome | 965.2 (287) | 947.19 (309.30) | 983.06 (262.78) | 0.289 |
| Mortality | 1009.4 (227.43) | 1003.90 (238.45) | 1014.86 (216.63) | 0.683 |
| Hospitalization for MI | 1081.9 (97.95) | 1078.34 (108.16) | 1085.41 (86.88) | 0.54 |
| Revascularization | 1057.8 (183.83) | 1042.77 (217.54) | 1072.78 (141.92) | 0.166 |

Figure S1a: Example of lower tertile LHR (LHR = 0.24)



Figure S1b: Example of Middle Tertile LHR (LHR = 0.32)



Figure S1c: Example of Upper Tertile LHR (LHR = 0.39)



Figure S2: Distribution of LHR across renal function at MPI using sestamibi tracer and regadenoson stress agent, performed at Columbia VA Health Care System between 2010 and 2015



CKD: Chronic Kidney Disease; stages: Normal: estimated glomerular filtration rate - eGFR >=60, stage 3a: eGFR 45-59, stage 3b: eGFR 30-44, stage 4/5: eGFR < 30, stage 6: requiring dialysis.

Figure S3a: Variability in primary outcome for LHR category by ESKD status

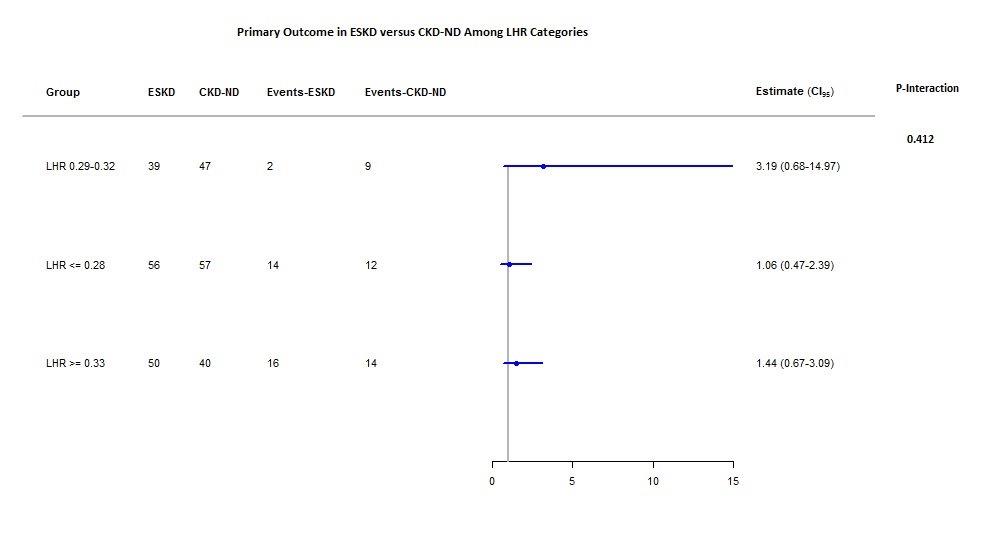


Figure S3b: Variability in mortality for LHR category by ESKD status

