



Sex-Based Differences in Sensitivity of Prehospital Stroke Scales in Stroke Detection



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Background

- Stroke is a leading cause of morbidity and mortality.
- Accurate prehospital identification using stroke screening scales is critical for timely treatment.
- Sex-based differences in stroke presentation may influence the sensitivity of these scales.

Objective and Hypothesis

- Objective:** Evaluate whether the sensitivity of prehospital stroke screening scales differs by sex.
- Hypothesis:** The diagnostic sensitivity of prehospital stroke screening tools varies between male and female patients.

Methods

- Retrospective study using data from 70 EMS agencies and 30 hospitals across two states.
- Inclusion:** Adults (≥18 years) identified by EMS as potential stroke patients with a final hospital diagnosis of stroke or TIA between January 1, 2020, and December 31, 2022.
- Sensitivities of commonly used prehospital stroke screening scales were compared between male and female patients using chi-square tests, with a two-sided p-value <0.05 considered statistically significant.

Demographics

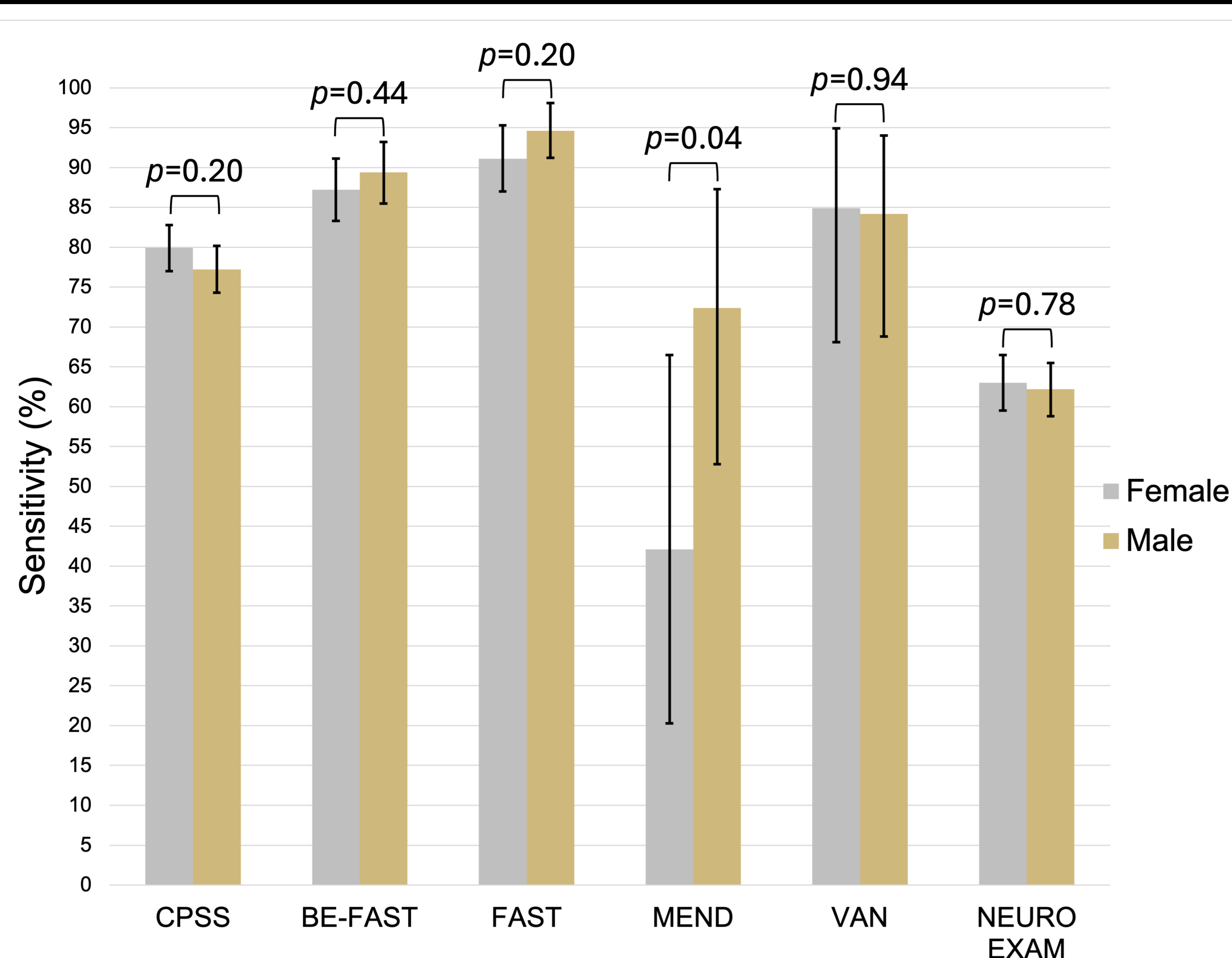
	Females	Males
N (%)	1476 (50.4%)	1451 (49.6%)
Age in years – mean ± stdev	75.8 ± 14.1	71.8 ± 13.8
Race – n (%)		
White	1003 (68.0%)	959 (66.1%)
Black	42 (2.8%)	63 (4.3%)
Asian	21 (1.4%)	18 (1.2%)
American Indian/Alaska Native	9 (0.6%)	6 (0.4%)
Native Hawaiian/Pacific Islander	3 (0.2%)	3 (0.2%)
Other	36 (2.4%)	31 (2.1%)
Ethnicity – n (%)		
Hispanic	78 (5.3%)	66 (4.5%)
Patient Comorbidities – n (%)		
Any cardiovascular risk factor	1281 (86.8%)	1261 (86.9%)
Initial NIHSS – median (IQR)	6 (2-14)	5 (2-13)

Results

Stroke Scale Utilization and Sensitivities

EMS Stroke Scale	Females n (%)	Males n (%)	Sensitivity of Stroke Scale in Females	Sensitivity of Stroke Scale in Males
CPSS	732 (49.6%)	764 (52.7%)	79.90%	77.20%
BE-FAST	282 (19.1%)	245 (16.9%)	87.20%	89.40%
FAST	180 (12.2%)	168 (11.6%)	91.10%	94.60%
MEND	19 (1.3%)	29 (2.0%)	42.10%	72.40%
VAN	33 (2.2%)	38 (2.6%)	84.90%	84.20%
NEURO EXAM	743 (48.5%)	790 (51.5%)	63.0%	62.2%

Comparison of Stroke Scale and Neurologic Exam Sensitivity by Sex



Conclusions and Future Directions

- Most prehospital stroke scales showed moderate to high sensitivity with no significant sex-based differences.
- The MEND scale demonstrated a sex-related difference, though this finding is limited by its small sample size.
- Reliance on neurological exam findings alone had lower sensitivity than validated scales.
- Future directions include research focused on targeted EMS education and protocol standardization to increase consistent stroke scale use.

Limitations

- The retrospective design relies on the accuracy and completeness of electronic health record documentation.
- Variation in stroke scale use across sites may have resulted in unequal representation of specific tools.
- Inclusion of 70 EMS agencies introduces variability in personnel training and assessment methods that may affect scale performance.

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References

