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Objectives

- Determine if there was a significant difference in the proportion of patients presenting to rural facilities with ST-elevation myocardial infarction (STEMI) who achieve percutaneous coronary intervention (PCI) within 120 minutes of first medical contact when comparing helicopter versus ground transport.

Background

In Southwest Oklahoma, ST-segment myocardial infarction (STEMI) patients often present to facilities that do not have the capability of performing percutaneous coronary intervention (PCI). In these scenarios, patients require transfer to PCI-capable hospitals for definitive care. The American Heart Association (AHA) currently recommends that PCI be achieved within 120 minutes of arrival at the initial, non-PCI facility, therefore requiring emergent and rapid transfer for definitive care.

Helicopter emergency medical services (HEMS) is often utilized when the transport distance is greater than 30 miles, however, it is uncertain if it is any better than ground transport in reducing time to PCI. The southwest Oklahoma region's STEMI network utilizes Comanche County Memorial Hospital (CCMH) as the primary receiving PCI facility.

The purpose of this study was to evaluate if HEMS transport to the regional PCI hospital in southwest Oklahoma is superior to ground transport in achieving PCI within 120 minutes of first medical contact.

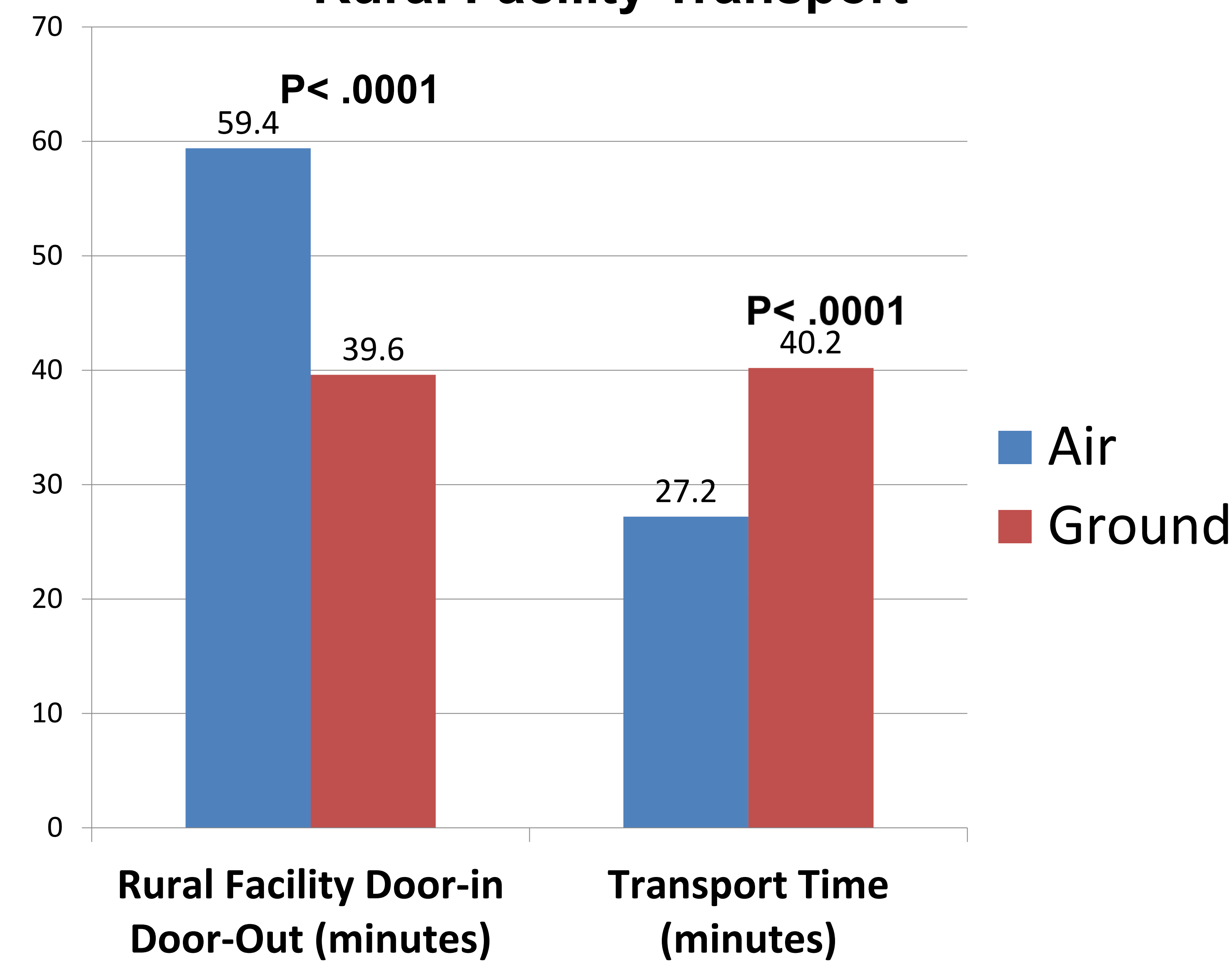
Methods

The project was approved by the Institutional Review Board prior to data collection and analysis. The STEMI registry was reviewed to gather data on patients transferred to Comanche County Memorial. Observational cohort study of STEMI patients in Southwest Oklahoma transferred from rural non-PCI capable facilities to the PCI-capable Regional Medical Center (Comanche County Memorial Hospital (CCMH)). All rural facilities in this study were greater than 30 miles from CCMH and utilized both helicopter and ground transport. The mode of transport was at the discretion of the rural clinician. The primary outcome variable was the proportion of STEMI patients that achieved PCI within 120 minutes from first medical contact. Secondary outcome variables were; rural facility door-in door-out time, transport time, Regional Medical Center arrival to PCI, and first medical contact to PCI. Chi-square test was utilized to compare the proportion of patients achieving PCI within 120 minutes. Mann-Witney U test was utilized to evaluate the secondary outcome time intervals. The results were expressed as means (minutes) ± SD. 137 total patient were enrolled (ground n=96, helicopter n=41).

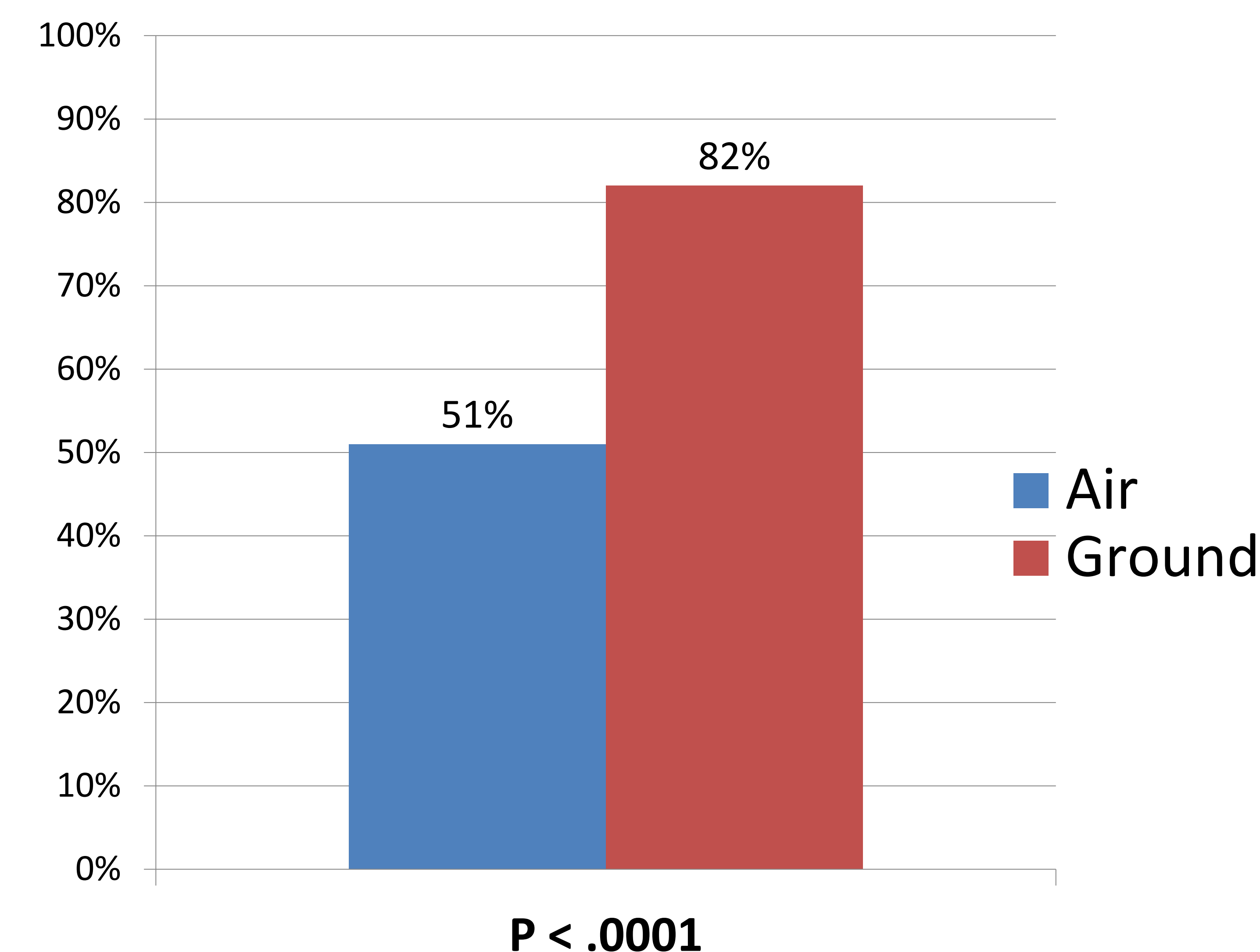
Results

137 consecutive patients (ground n=96 and air n=41) were included from January 1, 2015 – December 31, 2018. Patients that expired prior to PCI were excluded from this study. Rural facility door-in door-out was significantly increased when helicopter transport was utilized (59.4 ± 20.5 vs ground 39.6 ± 28.6 ; $P < .0001$). Transport time was significantly longer for ground transported patients (40.2 ± 8.1 vs helicopter 27.2 ± 8.2 ; $P < .0001$). However, first medical contact to PCI was significantly less with ground transport (114.6 ± 35.6 vs helicopter 125.9 ± 34.4 ; $P < .0001$). There was no significant difference in regional medical center arrival to PCI between the groups. Achieving PCI ≤ 120 minutes was more likely when ground transport was utilized (82% (95% CI .73-.89) vs helicopter 51% (95% CI .35-.67); $P < .0001$).

Rural Facility Transport



PCI Within 120 Minutes From First Medical Contact



Conclusion

In SW Oklahoma, STEMI patients transported by ground EMS were more likely to achieve PCI within the AHA guidelines. These results cannot be generalized to all distances, transport and weather conditions. Nonetheless, all elements of transport must be considered in decision making.

Limitations

- Helipad located 0.5 miles from hospital campus
- The majority of patient transfers were performed using ground EMS
- This was not a randomized trial; the transport decision was left to the discretion of the referring clinician.

References

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