Abstract 15

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Title: Gender Inequality on ECG to Decision Time for Primary PCI Treatment of STEMI

Background:
Primary PCI (percutaneous coronary intervention) is generally accepted as the guideline preferred reperfusion strategy over fibrinolysis in STEMI, when performed within 90 - 120 minutes or less of first medical contact. Various time segment metrics are often considered when trying to analyze and improve STEMI care performance, including door to ECG, door to balloon, etc. Very little data appears to be published focusing on the unique care performance metric of ECG to decision (E2Decide) time for Primary PCI treatment of STEMI. Furthermore, little appears known about the impact of gender on E2Decide time. The primary purpose of this retrospective analysis was to evaluate the impact of gender on E2Decide time for Primary PCI treatment of STEMI, for cases within two large rural mid-west STEMI systems, identified in three different settings: PCI capable hospital emergency departments, non-PCI capable facilities, and in the field by emergency medical services (EMS).

Methods:
289 consecutive STEMI activation cases were retrospectively analyzed for gender impact on E2Decide time for Primary PCI treatment. Data was collected and combined from two different PCI capable hospitals located 210 miles apart, in Duluth, Minnesota, and Fargo, North Dakota. We evaluated E2Decide time in the three different settings listed above. Cases were evaluated from May 2013 through February 2015 at one hospital, and from September 2013 through February 2015 at the other. Decision time was defined by the call time for inter-facility transport for Primary PCI, or the call time when the PCI capable hospital received the request to activate the Cath Lab. This analysis excluded cases if a fibrinolytic was given. EMS-identified STEMI’s presenting first to a non-PCI capable facility, were also not included in this analysis. Cases were excluded if intended Primary PCI was not performed. Some reasons for these exclusions include discovery of 3-vessel disease requiring coronary artery bypass graft surgery, cases deemed false activations with no culprit lesion found, if the patient died before PCI could be performed, or if the Cath Lab procedure was cancelled for any reason. Data was collected by three individuals, and was both stored and analyzed using a Microsoft Excel spreadsheet.

Results:
In all 3 settings combined (n=289), the mean (SD) and median female E2Decide time for Primary PCI treatment of STEMI was 11.1 (13.4) and 7 minutes (n=96) and that for males was 9.7 (1.9) and 6 minutes (n=193). The observed difference was 1.3 minutes longer for females than for males. Difference in mean log-transformed times: P=0.186 In the non-PCI capable
hospital setting (n=157), the mean (SD) and median female E2Decide time for Primary PCI treatment of STEMI was 12.5 (14.8) and 9 minutes (n=46) and that for males was 12.0 (15.7) and 7 minutes (n=111). The observed difference was 0.6 minutes longer for females than for males. Difference in mean log-transformed times: P=0.174 In the PCI capable hospital setting (n=73), the mean (SD) and median female E2Decide time for Primary PCI treatment of STEMI was 8.3 (10.0) and 5 minutes (n=29) and that for males was 5.7 (5.7) and 4 minutes (n=44). The observed difference was 2.6 minutes longer for females than males. Difference in mean log-transformed times: P=0.523 In the EMS field activation setting (n=59), the mean (SD) and median female E2Decide time for Primary PCI treatment of STEMI was 11.7 (14.5) and 6 minutes (n=21) and that for males was 7.9 (11.2) and 4 minutes (n=38). The observed difference was 3.8 minutes longer for females than males. Difference in mean log-transformed times: P=0.351

Conclusion:
We observed that the unique metric of E2Decide time for Primary PCI treatment of STEMI appears to take longer with females compared to males. This treatment decision delay with female STEMI patients was consistently observed in three different settings: at PCI capable hospital emergency departments, at non-PCI capable facilities, and in the field by EMS. The largest magnitude of decision delay disparity for females was observed in the EMS field activation setting, while the smallest magnitude of decision delay disparity for females occurred in the PCI capable hospital emergency department setting. The time delay disparity for females compared to males did not reach statistical significance. Given the sample size, it remains unknown if a clinically significant difference would be found in a larger cohort. The reasons for this observed disparity in STEMI treatment decision delay in females are unknown.

Our secondary finding was that the overall E2Decide time for both males and females was longest in the non-PCI capable hospital setting, and shortest in the PCI capable setting. Our data suggests that the metric of E2Decide time for Primary PCI treatment of STEMI in different settings should be considered by quality and educational efforts for STEMI care process improvement, with particular attention paid to female gender inequality. Further research of E2Decide time may be warranted.