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Prevalence of Recognized and Unrecognized Myocardial Infarction: The ICELAND MI Substudy to the AGES-Reykjavik Study

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Background: The National Institute on Aging and the Icelandic Heart Association are characterizing approximately 6000 persons aged 67 to 95 in the Age, Gene/Environment Susceptibility Study (AGES-Reykjavik Study). For the ICELAND MI ancillary study to AGES-RS, we hypothesized that the prevalence of unrecognized myocardial infarction (MI) is high in an elderly cohort and more MI will be detectable with gadolinium enhanced MRI than by ECG or clinically.
Methods: A random sample of 458 participants enrolled in AGES-RS underwent cardiac MRI (CMR) at 1.5T. Steady state free precession cine MRI was used to measure myocardial mass, LV volumes, and LV ejection fraction. Gadolinium enhanced inversion recovery MRI was performed to detect MI. Strict criteria and consensus of two cardiologists was used to diagnose myocardial infarction and exclude atypical delayed enhancement. Minnesota Codes were used to detect Q-wave MI by ECG. Recognized MI was defined by hospital records and the MONICA registry.
Results:
Of the 458 participants, gadolinium enhanced CMR quality was good or excellent in 87%, fair in 11%, non-diagnostic 0.4%, and not done in 2%. There were no complications. Thus, results were summarized for 447 subjects. Participants averaged 77±5 years, 54% were female, and 16% had a history of CABG or PCI. From hospital records and the MONICA registry, 42 subjects (9.4%) had known MI. By ECG at the time of the study, only 30 subjects (6.7%) met Minnesota Codes diagnostic for MI in the entire cohort. Combined, 62 subjects (13.9%) had MI identified by hospital records, MONICA criteria, or ECG. The prevalence of MI by gadolinium enhanced MRI was 97 (21.7%; 95% confidence limits 18-27%) and was greater than that determined by ECG ($p<0.001$) and vs clinically recognized MI ($p<0.001$). Accounting for overlap in criteria, the MRI determined prevalence of unrecognized MI was 12.5%.
Conclusions: The high prevalence of unrecognized MI led to a substantially higher overall prevalence of MI (21.7%) than predicted from the literature, even taking into account the age of the participants. MRI was substantially more sensitive in detecting MI than the ECG and/or clinical criteria.