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The Diagnostic Performance of Myocardial Perfusion Imaging -Results from a Single Hospital Registry between the Years 1997-2008

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Background: A major limitation in assessing the diagnostic accuracy of SPECT MPI is referral bias that must be taken into account when estimating the true sensitivity and specificity. A systematic assessment of the diagnostic performance of SPECT MPI and an estimate of referral bias have not yet been described in an Israeli nuclear cardiology laboratory.
Methods: Using the heart institute computerized database we identified all consecutive SPECT MPI studies between October 1997 and October 2008. We also identified all catheterizations before or following MPI. Demographic, clinical, MPI and catheterization data were extracted. Subjective quantitative assessment of 10-segment, 4-grade system was used to calculate modified sum stress score (SSS). A cutoff of SSS>2 was defined as abnormal. Significant coronary artery disease was defined as stenosis ≥70%.
Results: We identified 40502 studies. The average patients' age was 64 ±12 years, 60% were males, the rate of diabetes, hypertension, dyslipidemia, smoking and history of coronary artery disease was 26%, 53%, 57%, 14% and 48%, respectively. The median number of risk factors was 2. We found 6705 patients that underwent both MPI and catheterization within 180 days (3567 before and 3659 after). In 1579 patients there was no history of coronary disease. Of this group 656 studies were done- 60 following the MPI. For these studies the provocation was exercise in 291(44%) and Technetium was used in 319 (48%), the sensitivity was 362/404 (90%, CI 86-92%)) and the specificity was 88/252 (35%, CI 29-41%). Among 15383 patients with normal study only 328 (2%) were referred to catheterization demonstrating substantial referral bias. There were 1988 normal studies among 2247 very low risk patients giving a normalcy rate of 89%.
Conclusions: MPI gives excellent diagnostic performance with robust sensitivity and good specificity as reflected by the high normalcy rate. The referral bias is substantial.