A Systematic Review: Are MR Targeted Biopsies as Efficient as Standard TRUS Biopsies in the Detection of Clinically Significant Prostate Cancer?

Introduction and Objective: There is great interest in the use of MRI to define biopsy targets within the prostate. We performed a systematic review to compare the efficiency of MRI targeted biopsy with standard transrectal biopsy, in the detection of clinically significant prostate cancer.
Materials and Methods: The PubMed, EMBASE and Cochrane databases were searched from inception until 3rd December 2011, using the search criteria: 'prostate OR prostate cancer' AND 'magnetic resonance imaging OR MRI', AND 'biopsy OR target'. 4,222 records were retrieved and the abstracts assessed independently by 4 reviewers, with 222 records requiring full review. 50 unique records were identified which compared an MRI-targeted with a standard transrectal approach.
Results: Where MRI was applied to all biopsy-naïve men, 62% (374/599) had MRI abnormalities. When subjected to a targeted biopsy, 66% (248/374) had prostate cancer detected. Both targeted and standard biopsy detected clinically significant cancer in 43% (236 or 237/555 respectively). Missed clinically significant cancers occurred in 13 men using targeted biopsy and 12 using a standard approach. Targeted biopsy was more efficient. One-third fewer men were biopsied, overall. Those that had biopsy required a mean of 3.8 targeted cores, compared to 12 standard cores. In addition, a targeted approach avoided the diagnosis of clinically insignificant cancer in 53/555 (10%) of the presenting population.
Conclusion: MRI guided biopsy detects clinically significant prostate cancer in an equivalent number of men to standard biopsy, using fewer biopsies in fewer men, and a reduction in the diagnosis of clinically insignificant cancer. There is a need for a robust prospective multicentre study of targeted biopsies using contemporary MR imaging.