

[MRI use may “change the equation” for prostate cancer screening](#)

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Screening for prostate cancer is controversial. It can save lives, but it can also lead to unnecessary diagnoses, followed by surgical or radiation procedures, which themselves may lead to severe side-effects. Now a new study, coming from the Dutch part of the European Randomised study for the Screening of Prostate Cancer (ERSPC) has found that MRI-based screening can reduce overdiagnosis by 50% and reduce unnecessary biopsies by 70%, potentially changing the equation for prostate cancer screening. This work, the first to confirm that the use of MRI in a population-based screening setting may be viable, is presented at the EAU conference in London.

Prostate cancer is the most common cancer in men worldwide; in Europe alone there are more than 100,000 prostate cancer deaths each year. Despite this, prostate cancer has a rather slow progression rate, needing several years before becoming threatening for a patient. Cancer screening can cut the deaths significantly, but the current prostate cancer screening approach with repeated measurements of PSA (Prostate Specific Antigen) followed by a transrectal ultrasound-guided random prostate biopsy (TRUS-biopsy) does not give a satisfactory balance between lives saved and harm caused.

If a man has an elevated PSA level, the next step to determine whether he has prostate cancer is a TRUS-biopsy. This normally involves taking a series of 6 to 12 individual samples (“core samples”) from the prostate, using a fine needle. It’s often a hit or miss procedure, but the more samples you take, the more likely you are to find a small cancer, with the risk of finding a small cancer which may not be clinically threatening.

Now a group of Dutch researchers has compared the outcomes from the TRUS-biopsy approach with an MRI-based screening approach in a group of heavily pre-screened men*. They took 6-core TRUS-biopsy samples from 177 men, and 12-core TRUS-biopsy samples from 158 men: the 158 men who received a 12-core TRUS-biopsy had first been given an MRI scan. If the MRI showed a suspicious area, then further MRI- targeted biopsy samples were taken.

The researchers found that the 6-core TRUS-biopsy, 12-core TRUS biopsy and MRI-targeted biopsy method all had a similar detection rate for more dangerous (high-grade) cancers; however using the MRI-targeted biopsy method the majority of men (70%) did not need a biopsy at all as the MRI scan had shown no suspicious areas. In addition to potentially eliminating 70% of biopsies, the MRI-targeted biopsy only approach meant that the number of men who were overdiagnosed with non-aggressive cancer was reduced by half.

“This could change the balance of the equation” said lead author Dr Arnout Alberts (Erasmus Medical Centre, Rotterdam). *“It means that population-based prostate cancer screening with MRI instead of TRUS-biopsy has a significantly better risk/benefit ratio and could offer real benefits to men at risk of prostate cancer. Now we have shown that MRI screening has potential, we need confirmatory studies in a true screening setting to allow us to get a better handle on the statistics and costs. MRI screening for prostate cancer will be more expensive than the currently used approach, but*

introducing mammography screening a generation ago was also expensive; we have to decide if it's worthwhile. In this study we achieved a 70% reduction in biopsies and a 50% reduction in overdiagnosis of insignificant prostate cancer: if larger studies can reproduce these results it will mean a considerable saving further down the line"

Commenting, Professor Jochen Walz (Institut Paoli-Calmettes Cancer Centre, Marseille, France), Chair of EAU Section of Urological Imaging, said:

"MRI indeed has great potential to improve prostate cancer diagnosis. Still, we need to note that prostate MRI is a challenging imaging technology with good results depending on the skills of dedicated and well trained experts, which is another parallel shared with mammography. Before prostate MRI might be used in a general population for early detection or screening of prostate cancer, these issues need to be solved, which is why the EAU and the European Society of Urogenital Radiology have jointly started a quality initiative for prostate MRI. Moreover, the cost effectiveness and the extensive need of health resources are another pending issue, needing further realistic analyses before the above approach can be recommended for routine use.

**The authors note that this is a potential limitation of the study*

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Notes for Editors

PLEASE MENTION THE EUROPEAN ASSOCIATION OF UROLOGY CONGRESS IN ANY STORY RESULTING FROM THIS PRESS RELEASE

The 32nd European Association of Urology conference takes place in London from 24th to 28th March. This is the largest and most important urology congress in Europe, with up to 13,000 expected to attend. Conference website <http://eau17.uroweb.org/>

Contacts

Dr Arnout Alberts

a.r.alberts@erasmusmc.nl

Ass. Professor Jochen Walz

WALZJ@ipc.unicancer.fr

EAU Press Officer, Tom Parkhill: tom@parkhill.it telephone +39 349 238 8191

How has this work been reviewed? This work has not gone through a journal peer-review process. This work is amongst the top-rated 150 abstracts (out of 1171 accepted from around 5000 submissions) from the EAU congress. It was reviewed for suitability and accuracy by members of the EAU communications group at more than one stage in development, and subsequently reviewed by a specialist in the field on behalf of the EAU.

Abstract: Value of magnetic resonance imaging in population-based prostate cancer screening: Comparison of 3 biopsy strategies in the 5th screening round of the ERSPC Rotterdam [Alberts, A.](#), Schoots, I., Drost, F.-J., Bokhorst, L., Van Leenders, G., Dwarkasing, R, Barentsz, J⁴, Schröder, F¹, Bangma, C., Roobol, M

Introduction & Objectives

The European Randomized study of Screening for Prostate Cancer (ERSPC) showed that screening using sextant transrectal ultrasound-guided biopsy (6-TRUS-Bx) reduces mortality but also causes overdiagnosis. A screening strategy using 12-core TRUS biopsy (12-TRUS-Bx) could increase the high-grade (Gleason score $\geq 3+4$) prostate cancer (PCa) detection, while an MRI +/- target biopsy (MRI \pm TBx) strategy could reduce overdiagnosis of low-grade (Gleason score 3+3) PCa. In this study we compare the 3 biopsy strategies in the 5th screening round of the ERSPC Rotterdam.

Material & Methods

Men in the 5th screening round (2013 – 2016) with a PSA ≥ 3.0 ng/ml received either 6-TRUS-Bx or chose to be included in the MRI side study and received a multiparametric MRI. In men in the side study a 12-TRUS-Bx was performed blinded for MRI results. Additionally, PI-RADS ≥ 3 lesions were targeted with 2 cores using MRI-TRUS fusion guidance. The PCa detection rates of 3 biopsy strategies were compared: the 6-TRUS-Bx (group 1) vs 12-TRUS-Bx (group 2a) vs MRI \pm TBx (group 2b) strategy.

Results

A total of 177 men with PSA ≥ 3.0 ng/ml received 6-TRUS-Bx while 158 men received MRI with 12-TRUS-Bx \pm TBx. These men had a mean age of 73.2 years (SD \pm 1.1) and a mean PSA of 5.1 ng/ml (SD \pm 2.8). A total of 183/335 (55%) had received a previous negative 6-TRUS-Bx. There were no significant differences in terms of age, PSA and previous biopsy status between men who received 6-TRUS-Bx and men in the MRI side study. A total of 110/158 (70%) men in the side study had no suspicious lesions on MRI and thus did not receive TBx. The high-grade PCa detection rate of 6-TRUS-Bx (10%), 12-TRUS-Bx (12%) and MRI \pm TBx (11%) were comparable (table 1). The low-grade PCa detection rate of 12-TRUS-Bx (28%) was significantly higher as compared to 6-TRUS-Bx (17%), while the low-grade PCa detection rate of MRI \pm TBx (7%) was significantly lower.

Conclusions

In our cohort of repeatedly screened men the performance of 12-TRUS-Bx instead of 6-TRUS-Bx increased only the detection of low-grade PCa. An MRI \pm TBx strategy reduces biopsy procedures (70%) and overdiagnosis of low-grade PCa (>50%), while maintaining a similar detection rate of high-grade PCa. The MRI \pm TBx strategy is thus preferred, as it tackles the major drawbacks of population-based screening.

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