

Attitudes and perceptions towards multiparametric magnetic resonance imaging of the prostate: A national survey among Italian urologists

Arnaldo Stanzione¹, Massimiliano Creta², Massimo Imbriaco¹, Roberto La Rocca², Marco Capece², Fabio Esposito², Ciro Imbimbo², Ferdinando Fusco³, Giuseppe Celentano², Luigi Napolitano², Francesco Mangiapia², Vincenzo Mirone², Nicola Longo²

¹ Department of Advanced Biomedical Sciences, University of Naples "Federico II", Naples, Italy;

² Department of Neurosciences, Reproductive Sciences and Odontostomatology, University of Naples "Federico II", Naples, Italy;

³ Department of Woman Child and of General and Specialist Surgery, University of Campania "Luigi Vanvitelli", Naples, Italy.

Summary *Objective: We aimed to assess the attitudes and perceptions towards multiparametric magnetic resonance imaging (mpMRI) of the prostate among Italian urologists.*

Material and Methods: A national, web-based survey was performed. A questionnaire composed of 18 multiple choice questions was e-mailed to 941 currently active urologists, members of the Italian Society of Urology. Preserving anonymity, respondents' demographics were collected (e.g. geographic region, type of workplace, prostate procedures performed) as well as data concerning their attitudes and perceptions towards mpMRI (e.g. indications deemed appropriate, degree of confidence in mpMRI results). Data were expressed as raw numbers and percentages of survey answers.

Results: In total, 98 responses were received (participation rate = 10.4%). Respondents mostly worked in urban areas (96%) and primarily in hospital settings (89%), while 48% of them worked in southern Italy. 97% of respondents considered mpMRI useful to detect Prostate Cancer (PCa) in patients with prior negative biopsy, 64% in biopsy-naïve patients and 60% for PCa pre-operative staging. About half (42%) of the participants declared that mpMRI results frequently lead them to change PCa management strategy. Standardization of mpMRI acquisition and reporting was partially unsatisfactory.

Reported waiting time for mpMRI scans was longer than 4 weeks for 51% of respondents. The major limitation of this survey includes the small number of participants.

Conclusions: Prostate mpMRI is used by Italian urologists mainly for detection and for pre-operative staging of PCa. Further improvements in terms of mpMRI availability and report standardization are required.

KEY WORDS: Multiparametric magnetic resonance imaging; Prostate cancer; Prostate imaging reporting and data system; Prostate biopsy; Survey.

Submitted 5 July 2020; Accepted 3 September 2020

INTRODUCTION

Multiparametric magnetic resonance imaging (mpMRI) of the prostate has emerged as a valuable tool for the detection of clinically significant prostate cancer (PCa) and the

acceptance of this novel technology within the urology community has steadily increased (1). Current European Association of Urology (EAU) Guidelines strongly recommend prostate mpMRI before re-biopsy in patients with persistent suspicion of PCa despite a prior negative biopsy and before confirmatory biopsy in PCa patients on active surveillance (AS) (2). Further potential applications of prostate mpMRI include detection of PCa in biopsy naïve patients, PCa staging prior to treatment and suspicion of local PCa recurrence (1, 2).

The technique has undergone progressive refinements over time regarding acquisition protocol, image interpretation and reporting (3, 4).

In 2012, the European Society of Urogenital Radiology established clinical guidelines for the acquisition, interpretation, and reporting of prostate mpMRI in order to allow an adequate level of standardization and consistency (5). These recommendations, popularly referred to as Prostate Imaging - Reporting and Data System (PI-RADS), were based on literature evidence and consensus expert opinion (5).

In 2014, the PI-RADS version 2 was officially launched (6). Currently, the standard mpMRI protocol combines morphological information derived from high spatial resolution T2-weighted images, and functional data concerning cell density (diffusion weighted imaging [DWI] with apparent diffusion coefficient [ADC] maps) and vascularization (dynamic contrast-enhanced imaging) (7).

Despite the efforts to improve prostate mpMRI adoption and quality of reports, the acceptance and the standardization of the procedure in everyday clinical practice still suffer from many limitations. Indeed, mpMRI is not readily available at all institutions, and facilities' adherence to technical standards is variable and sometimes suboptimal (8).

Attitudes and perceptions toward prostate mpMRI vary across countries and, to date, these aspects have not been investigated in Italy (9-12). The goal of the present survey was to investigate patterns of attitudes and perceptions among practicing Italian urologists with regard to the use of mpMRI to manage PCa as well as mpMRI availability and reporting quality.

MATERIALS AND METHODS

Questionnaire

An online survey consisting of 18 multiple choice questions (formulated in Italian with the aim of increasing the response rate) was designed using the Google Form application included in the Google Drive office suite (Google LLC). The questionnaire was composed of two sections: a first one to assess respondents' demographics and a second one to evaluate their attitudes and perceptions (i.e. prescription attitudes; mpMRI availability; reporting quality; sequences considered useful in clinical practice; perceptions toward the usefulness of the procedure; impact of mpMRI results on the decision making process; management of PI-RADS 3 lesions; type of targeted prostate biopsy performed or recommended). In particular, questions about demographics included: years since completion of residency, type and location of medical practice, execution of prostate biopsies, and number of prostatectomies performed monthly. mpMRI availability was addressed by asking about average waiting time for the exam. Questions about attitudes toward mpMRI indications investigated the following potential settings: biopsy naïve patients, patients with clinical suspicious PCa despite a previous negative biopsy, pre-treatment staging, suspicion of local recurrence, AS. Questions about reporting quality addressed: the description of the sequences used, the adoption of the PI-RADS version 2 scoring system, and the presence of a segmentation map with clear identification of the index lesion in the reports received. Questions about perceptions toward the clinical utility of prostate mpMRI were formulated to assess the perceived reliability of PI-RADS v2 in identifying clinically significant PCa, and the utility in the evaluation of local stage and recurrences. Some questions required a single answer while others gave the respondents the choice to select as many answers as they felt appropriate.

Data collection

Invitations to participate in this anonymous survey were e-mailed on 28 January 2019 to 941 current *Italian Society of Urology* (SIU) members who gave the approval to the use of their e-mail address. All survey participants were practicing urologists in Italy. For those who had not completed the survey, four follow-up reminder e-mail invitations were sent over the following 2 weeks. The survey was closed on 28 February 2019. All respondents had to fully complete the questionnaire before submission since all questions were flagged as mandatory. After submission, users could not review neither amend their answers. Both personal contact information and data collected were not accessible to third parties.

Data analysis

Data were expressed as raw numbers and percentages of survey answers. Chi square and Fisher's exact tests were used to assess variability in responses between demo-

Table 1.

Survey demographics and mpMRI of the prostate availability.

Question	n (%)	
How many years since you completed residency?	< 10 years	42 (43)
	10-30 years	46 (47)
	> 30 years	10 (10)
What type of practice do you work in primarily?	Academic hospital	51 (52)
	Community hospital	36 (37)
	Private practice	11 (11)
What type of setting do you practice in?	Urban	94 (96)
	Non urban	4 (4)
In which Region do you practice in?	North	28 (29)
	Center	23 (23)
	South	47 (48)
Do you perform prostate biopsy?	Yes	69 (70)
	Not	29 (30)
On average, how many radical prostatectomies are performed monthly in your Center?	< 10	40 (41)
	10-20	32 (33)
	> 20	26 (26)
On average, how long do your patients wait for a mpMRI?	< 2 weeks	13 (13)
	2-4 weeks	35 (36)
	> 4 weeks	50 (51)

mpMRI: multiparametric Magnetic Resonance Imaging

graphic groups and according to mpMRI availability. Statistical analyses were two-sided using a significance level of 0.05. All statistical analyses were performed with SPSS version 17.0 (SPSS, Inc., Chicago, IL) software.

RESULTS

A total of 98 responses were received from the survey within 30 days of the initial request (participation rate = 10.4%). Table 1 shows demographic data of the respondents and information about average waiting time for prostate mpMRI. Ninety percent of respondents (n = 88)

Figure 1.

Attitudes toward the prescription of mpMRI of the prostate in the various clinical settings.

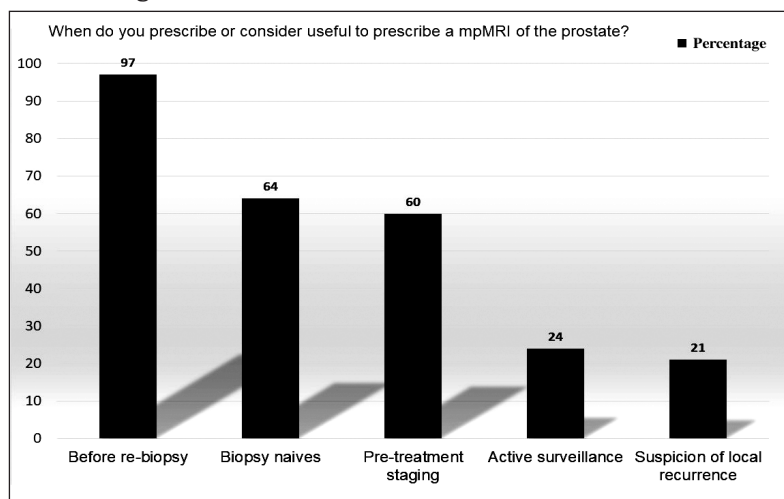


Table 2.
Urologists' attitudes and perceptions toward mpMRI of the prostate.

Question	n (%)
When do you prescribe or consider useful to prescribe a mpMRI of the prostate?	
Biopsy naïve patients	63 (64)
Before re-biopsy	95 (97)
Pre-operative staging	59 (60)
Suspicion of local recurrence	21 (21)
Active surveillance	24 (24)
Which of the following sequences do you consider useful for your clinical practice?	
High resolution T2-weighted alone	9 (9)
Axial DWI with ADC maps alone	3 (3)
Axial perfusion alone	3 (3)
High resolution T2-weighted + Axial DWI with ADC maps	24 (25)
High resolution T2-weighted + Axial perfusion	2 (2)
Axial DWI with ADC maps + Axial perfusion	7 (7)
High resolution T2-weighted + Axial DWI with ADC maps + Axial perfusion	39 (40)
High resolution T2-weighted + Axial DWI with ADC maps + Axial perfusion + Spectroscopy	8 (8)
Axial DWI with ADC maps + Axial perfusion + Spectroscopy	2 (2)
High resolution T2-weighted + Axial DWI with ADC maps + Spectroscopy	1 (1)
How do you manage PI-RADS 3 lesions?	
No further investigations	1 (1)
Secondary interpretation in referral centers	25 (26)
Targeted prostate biopsy as for PI-RADS 4 and 5 lesions	25 (26)
Targeted prostate biopsy only in cases of high clinical suspicious	20 (19)
Standard biopsy	27 (28)
How often results from mpMRI change your strategy?	
Almost always	5 (5)
Often	36 (37)
Sometimes	52 (53)
Hardly ever	5 (5)
Which technique of targeted prostate biopsy do you perform or advise?	
Visual-cognitive	46 (47)
Software-assisted registration MRI-TRUS	49 (50)
MRI guidance	3 (3)
In your clinical practice, how do you rate the reliability of PI-RADS v2 in identifying clinically significant PCa?	
Highly reliable	21 (21)
Reliable	75 (76)
Unreliable	2 (2)
In your clinical practice, how do you rate the reliability of mpMRI in local staging of PCa?	
Highly reliable	24 (24)
Reliable	69 (70)
Unreliable	5 (5)
In your clinical practice, how do you rate the reliability of mpMRI in the evaluation of local recurrence?	
Highly reliable	11 (11)
Reliable	68 (69)
Unreliable	19 (20)

ADC: Apparent Diffusion Coefficient; DWI: Diffusion Weighted Imaging; mpMRI: multiparametric Magnetic Resonance Imaging; PI-RADS: Prostate Imaging - Reporting and Data System.

completed residency less than 30 years before the survey. About half of them (48%, n = 47) worked in Southern Italy, 96% (n = 94) in urban areas, and 89% (n = 87) primarily in a hospital setting. Seventy percent of respondents (n = 69) declared to personally perform prostate biopsy and about half of them (51%, n = 50) declared that their patients wait more than 4 weeks for a prostate mpMRI. Urologists' attitudes toward prostate mpMRI prescription in various clinical scenarios are reported in Table 2. The prevalence of indications for prostate mpMRI in the settings explored are shown in

Table 3.
Indications to mpMRI according to demographic features and mpMRI availability.

	Biopsy naïve patients (n = 63)	Before repeat biopsy (n = 95)	Pre-operative staging (n = 59)	Suspect local recurrence (n = 21)	Patients active surveillance (n = 24)
Years since completion of residency					
< 10 (n = 42)	28 (66.7%)	41 (97.6%)	26 (61.9%)	8 (19.0%)	11 (26.2%)
10-30 (n = 46)	27 (58.7%)	44 (95.7%)	25 (54.3%)	10 (21.7%)	12 (26.1%)
> 30 (n = 10)	8 (80.0%)	10 (100%)	8 (80.0%)	3 (30.0%)	1 (10.0%)
p	0.419	1.000	0.316	0.682	0.657
Setting of practice					
Academic hospital (n = 51)	33 (64.7%)	50 (98.0%)	30 (58.8%)	14 (27.5%)	14 (27.5%)
Community hospital (n = 36)	23 (63.9%)	36 (100%)	22 (61.1%)	6 (16.7%)	8 (22.2%)
Private practice (n = 11)	7 (63.6%)	9 (81.8%)	7 (63.6%)	1 (9.1%)	2 (18.2%)
p	0.999	0.032	0.999	0.333	0.792
Region					
North (n = 28)	23 (82.1%)	26 (92.9%)	18 (64.3%)	2 (7.1%)	8 (28.6%)
Center (n = 23)	10 (43.5%)	23 (100%)	17 (73.9%)	5 (21.7%)	4 (17.4%)
South (n = 47)	30 (63.8%)	46 (97.9%)	24 (51.1%)	14 (29.8%)	12 (25.5%)
p	0.016	0.438	0.162	0.060	0.652
Do you perform biopsy?					
Yes (n = 69)	42 (60.9%)	68 (98.6%)	40 (58.0%)	15 (21.7%)	17 (24.6%)
No (n = 29)	21 (72.4%)	27 (93.1%)	19 (65.5%)	6 (20.7%)	7 (24.1%)
p	0.276	0.208	0.486	0.907	0.958
Radical prostatectomies performed in the working center per month					
< 10 (n = 40)	19 (47.5%)	39 (97.5%)	24 (60.0%)	11 (27.5%)	8 (20.0%)
10-20 (n = 32)	25 (78.1%)	30 (93.8%)	19 (59.4%)	6 (18.8%)	10 (31.3%)
> 20 (n = 26)	19 (73.1%)	26 (100%)	16 (61.5%)	4 (15.4%)	6 (23.1%)
p	0.014	0.483	0.985	0.495	0.533
Waiting time for mpMRI					
< 2 weeks (n = 13)	8 (61.5%)	12 (92.3%)	5 (38.5%)	4 (30.8%)	6 (46.2%)
2-4 weeks (n = 35)	23 (65.7%)	33 (94.3%)	24 (68.6%)	7 (20.0%)	6 (17.1%)
> 4 weeks (n = 50)	32 (64.0%)	50 (100%)	30 (60.0%)	10 (20.0%)	12 (24.0%)
p	0.962	0.139	0.166	0.463	0.114

Figure 1. In particular, the following values were found: suspicious PCa in patients with prior negative biopsy (97%, n = 95), suspicious PCa in biopsy naïve patients (64%, n = 63), pre-operative staging (60%, n = 59), active surveillance (24%, n = 24), suspicious local recurrence (21%, n = 21). Geographic region and number of radical prostatectomies performed per month were significant factors influencing the prescription of prostate mpMRI in biopsy-naïve patients while setting of practice was the only factor influencing the prescription of prostate mpMRI in the re-biopsy setting (Table 3). Results from questions investigating the quality of reports received are showed in Table 4. Most respondents (81%, n = 79) declared to receive reports including a list of the sequences acquired and evaluated. The percentages of respondents declaring to receive often or almost always a report interpreted using PI-RADS v2 guidelines and including a prostate segmentation map with the index lesions highlighted were 88% (n = 86) and 78% (n = 76), respectively. mpMRI sequences judged as useful are showed in Table 2. Forty percent of respondents (n = 39) judged useful the combination of high resolution T2-weighted, axial DWI with ADC maps, and axial perfusion sequences. The percentages of respondents judging reliable or highly reliable mpMRI in identifying clinically significant PCa, in local staging and in evaluating of local recur-

Table 4.
mpMRI data reporting.

Question	n (%)
Do mpMRI reports you receive include a list of MRI sequences acquired and evaluated?	
Yes	79 (81)
Not	19 (19)
How often the mpMRI reports you receive are interpreted (and lesions scored) using the PI-RADS v2 guidelines?	
Almost always	62 (63)
Often	24 (25)
Sometimes	11 (11)
Hardly ever	1 (1)
How often the mpMRI reports you receive include a prostate segmentation map with the index lesions highlighted?	
Almost always	45 (46)
Often	31 (32)
Sometimes	14 (14)
Hardly ever	8 (8)

mpMRI: multiparametric Magnetic Resonance Imaging; PI-RADS: Prostate Imaging - Reporting and Data System.

rences were 97%, 94% and 79%, respectively. Overall, 42% of them declared to change often or almost always PCa management strategy based on mpMRI results. In total, only 26% of respondents declared to prescribe targeted biopsy in cases of PI-RADS 3 lesions as for PI-RADS 4 and 5 lesions. The percentages of respondents declaring to perform or advise targeted prostate biopsy with software assisted registration MRI-ultrasound, visu-

Table 5.
Targeted biopsy modality of choice.

	Visual-cognitive (n = 46)	Software-assisted registration MRI-TRUS (n = 49)	MRI guidance (n = 3)
Years since completion of residency			
< 10 (n = 42)	19 (45.2%)	21 (50.0%)	2 (4.7%)
10-30 (n = 46)	24 (52.1%)	21 (45.6%)	1 (2.1%)
> 30 (n = 10)	3 (30.0%)	7 (70.0%)	0 (0%)
p	0.429	0.398	0.714
Setting of practice			
Academic hospital (n = 51)	28 (54.9%)	23 (45.0%)	0 (0%)
Community hospital (n = 36)	13 (36.1%)	20 (55.5%)	3 (8.3%)
Private practice (n = 11)	5 (45.4%)	6 (54.5%)	0 (0%)
p	0.225	0.292	0.125
Region			
North (n = 28)	7 (25.0%)	19 (67.8%)	2 (7.1%)
Center (n = 23)	13 (56.5%)	10 (43.4%)	0 (0%)
South (n = 47)	26 (55.3%)	20 (42.5%)	1 (2.1%)
p	0.024	0.088	0.436
Do you perform biopsy?			
Yes (n = 69)	33 (47.8%)	33(47.8%)	3 (4.3%)
No (n = 29)	13 (44.8%)	16 (55.1%)	0 (%)
p	0.786	0.506	0.552
RP performed in the working center per month			
< 10 (n = 40)	22 (55%)	18 (45.0%)	0 (0%)
10-20 (n = 32)	18 (56.2%)	13 (40.6%)	1 (3.1%)
> 20 (n = 26)	6 (23.0%)	18 (69.2%)	2 (7.6%)
p	0.017	0.071	0.183
Waiting time for mpMRI			
< 2 weeks (n = 13)	6 (46.1%)	7 (53.8%)	0 (0%)
2-4 weeks (n = 35)	18 (51.4%)	17 (48.5%)	0 (0%)
> 4 weeks (n = 50)	22 (44%)	25 (50.0%)	3 (6.0%)
p	0.818	0.999	0.372

al cognitive, and MRI guidance techniques were 50%, 47%, and 3%, respectively. Geographic region and number of radical prostatectomies performed per month were significant factors influencing the adoption of visual cognitive technique (Table 5).

DISCUSSION

The adoption of prostate mpMRI to detect and characterize prostate lesions and to tailor the management of PCa patients has evolved over the last 10 years (11, 13-15). Currently, however, the availability of this technology, the quality of reporting, and urologists' perceptions and attitudes toward significantly varies across countries and some authors have stressed the need to integrate prostate mpMRI teaching courses into the training of urologists (16). To the best of our knowledge, we performed the first survey examining prostate mpMRI availability, quality of reports as well as urologists' attitudes and perceptions toward this diagnostic modality in Italy. The response rate elicited was within the range of surveys on this topic (10, 11, 17). Respondents seemed to look favorably upon use of prostate mpMRI, as 100% of them declared to prescribe or consider useful to prescribe it in at least one setting. By comparison, the survey published by Muthigi and coworkers in 2017 found only 85.7% of urologists declaring to use prostate mpMRI in their practice (9).

The top settings for the use of prostate mpMRI was in patients with persistent PCa suspicion despite a prior negative biopsy (97%), followed by PCa suspicion in biopsy naïve patients (64%) and pre-operative staging (60%). Accordingly, most of respondents had a positive perception toward the ability of mpMRI to identify clinically significant PCa and to provide an adequate local staging. The high percentage of respondents declaring to prescribe mpMRI in patients with persistent PCa suspicion despite a prior negative biopsy confirms the results from previous surveys from other counties (9, 11). Indeed, 89.5% of respondents in the survey by *Muthigi and coworkers* declared to prescribe prostate mpMRI in this clinical scenario (9). To date, there is strong evidence demonstrating that mpMRI-guided biopsy increases the detection rate for clinically significant PCa when compared to standard biopsies and current EAU Guidelines strongly recommend mpMRI prior to repeat biopsy (2). Interestingly, we found that urologists working in private practice setting were less prone to prescribe mpMRI before repeat biopsy.

The percentage of respondents prescribing mpMRI on biopsy naïve patients was higher if compared with published evidence. Indeed, previous surveys reported percentages of utilization of prostate mpMRI in this setting ranging from 36.8% to 53% (9, 11). Evidences about prostate mpMRI in this setting are contradictory and current Guidelines provide only weak recommendations for the adoption of mpMRI in patients undergoing their first biopsy (2). However, results from the recent randomized multicenter PRECISION trial involving 500 biopsy-naïve patients with suspected PCa support the role of pre-biopsy prostate mpMRI and recommendations may change in the future (18). mpMRI is considered as the imaging modality of choice for local staging (19). Sixty percent of

respondents in the present survey declared to prescribe mpMRI for pre-operative staging. This finding is in line with published evidences as previous surveys from other countries reported percentages of utilization of mpMRI in this setting ranging from 38% to 85% (9, 11, 17).

Only a small percentage of respondents declared to prescribe prostate mpMRI in the clinical setting of AS (24%) and suspect local recurrence (21%). mpMRI has emerged as a valuable diagnostic modality in both patient selection and monitoring for men who undergoing AS for PCa and its use in this clinical scenario is gradually increasing (20-22). Current EAU Guidelines strongly recommend prostate mpMRI in men on AS before confirmatory prostate biopsy if not done before the first biopsy (2). However, multiple barriers have been reported to counteract the widespread use of mpMRI for AS including quality, cost and access to care (20). Accordingly, receipt of mpMRI among PCa patients on AS significantly vary across demographic, geographic, and socioeconomic strata (21). The percentage of respondents prescribing mpMRI in AS setting we reported is lower if compared to data obtained from published surveys. Indeed, 85% of French urologists and 66% of urologists working in the United States declared to utilize mpMRI in this setting (11, 17). Moreover, although published surveys involving urologists working France and in the United States demonstrated that the percentage of urologists prescribing prostate mpMRI in patients enrolled in AS was significantly higher among those working in academic hospitals, we failed to confirm this finding (11). Similar to AS setting, the percentage of urologists involved in the present survey that declared to prescribe mpMRI in patients with suspicious of local recurrence was lower when compared to those from other surveys. Indeed, 51% of French urologists declared to prescribe mpMRI with the intent to detect local recurrence following radical treatments (11).

Urologists prescribing prostate mpMRI need to be confident regarding the report they receive, as both their decision-making process and the quality of targeted prostate biopsy they perform mainly depends on the count, location, and radiographic stage of lesions identified by the radiologist (16, 23). Interestingly, about 22% of respondents in the present survey declared to receive reports that sometimes or hardly ever include a prostate segmentation map with the index lesions highlighted, 19% declared to receive reports that do not include a list of MRI sequences acquired and evaluated, and 12% declared to receive reports that sometimes or hardly ever are interpreted using the PI-RADS v2 guidelines. Taken together, these results underline the need to further improve in our Country the process of standardization of prostate mpMRI reporting.

We collected evidences about urologists' point of view concerning mpMRI acquisition protocol and relevance of included sequences. The answers collected seem to indicate that the urologists might not be completely aware of the dominant sequence structure of the PI-RADS v2 guidelines. Indeed, fewer than half responders (40%) correctly identified the currently recommended protocol suggesting that the major revision of the original PI-RADS has not been universally embraced among urolo-

gists. Furthermore, it should also be noted that a relatively high percentage (25%) of urologists indicated that a protocol without the perfusion sequence could be considered adequate for their patients. This is somewhat in line with a current trend advocating for the need of shorter, cheaper and less invasive MRI protocols and reinforces the ongoing debate about the role of perfusion sequences in prostate imaging (24-26).

The management of undetermined, PI-RADS 3 lesions has represented a controversial issue for many years. Accordingly, the attitude of respondents is heterogeneous with only 26% of them recommending targeted biopsies as for PI-RADS 4 and 5 lesions and 20% performing targeted biopsies only in cases of high clinical suspicion. More recent EAU Guidelines, updated in March 2019, consider prostate lesions with a PI-RADS score ≥ 3 as positive and strongly recommend performing targeted plus systematic biopsy in biopsy naïve patients and targeted biopsy only in patients with prior negative biopsy (2).

The modality with which prostate lesions identified by mpMRI are targeted at biopsy vary considerably. Visual-cognitive and software-assisted registration MRI-Transrectal ultrasound guidance were the most frequently adopted guidance modalities by respondents in the present survey with MRI-guidance being adopted by only 3% of interviewed. Of note, the adoption of visual-cognitive guidance was significantly lower in Northern Italy and in centers where more than 20 radical prostatectomies are performed monthly. Of note, the modality of lesion targeting during prostate biopsy represents a controversial and evolving issue (27-29). Beyond technical aspects, tumor multifocality is frequently involved in the discrepancies between findings from mp-MRI, prostate biopsy, and surgical specimens (29). Although MRI-guidance may represent a promising technique of biopsy guidance, it is still considered a time-consuming and expensive procedure and further investigations are needed to identify the ideal candidates (30).

The major limitation of this survey includes the small number of participants. However, the response rate is within published ranges. Secondly, respondents are not fully representative of the overall community of Italian urologists as those working in private practice setting and rural areas are poorly represented. Moreover, like any survey, participant responses were limited to the available choices.

CONCLUSIONS

This survey shows that prostate mpMRI is routinely used by urologists in Italy mainly before biopsy and for pre-operative staging purposes. mpMRI availability and report standardization are suboptimal.

REFERENCES

1. Cuocolo R, Stanzone A, Ponsiglione A, et al. Clinically significant prostate cancer detection on MRI: A radiomic shape features study. *Eur J Radiol.* 2019; 116:144-149.
2. Mottet N, van den Bergh R.C.N, Briers E, et al. EAU - EANM - ESTRO - ESUR - SIOG Guidelines on Prostate Cancer, 2019.

3. Weinreb JC, Barentsz JO, Choyke PL, et al. PI-RADS Prostate Imaging - Reporting and Data System: 2015, Version 2. *Eur Urol*. 2016; 69:16-40.
4. Manfredi M, Mele F, Garrou D, et al. Multiparametric prostate MRI: technical conduct, standardized report and clinical use. *Minerva Urol Nefrol*. 2018; 70:9-21.
5. Barrett T, Turkbey B, Choyke PL. PI-RADS version 2: what you need to know. *Clin Radiol*. 2015; 70:1165-76.
6. Turkbey B, Rosenkrantz AB, Haider MA, et al. Prostate Imaging Reporting and Data System Version 2.1: 2019 Update of Prostate Imaging Reporting and Data System Version 2. *Eur Urol*. 2019; 76:340-351.
7. Tewes S, Mokov N, Hartung D, et al. Standardized reporting of prostate MRI: comparison of the Prostate Imaging Reporting and Data System (PI-RADS) Version 1 and Version 2. *PLoS One*. 2016; 11:e0162879.
8. Esses SJ, Taneja SS, Rosenkrantz AB. Imaging facilities' adherence to PI-RADS v2 minimum technical standards for the performance of prostate MRI. *Acad Radiol*. 2018; 25:188-195.
9. Muthigi A, Sidana A, George AK, et al. Current beliefs and practice patterns among urologists regarding prostate magnetic resonance imaging and magnetic resonance-targeted biopsy. *Urol Oncol*. 2017; 35:32.e1-32.e7.
10. Manley BJ, Brockman JA, Raup VT, et al. Prostate MRI: a national survey of Urologist's attitudes and perceptions. *Int Braz J Urol*. 2016; 42:464-71.
11. Renard-Penna R, Rouvière O, Puech P, et al. Current practice and access to prostate MR imaging in France. *Diagn Interv Imaging*. 2016; 97:1125-1129.
12. Bukavina L, Tilburt JC, Konety B, et al. Perceptions of prostate MRI and fusion biopsy of radiation oncologists and urologists for patients diagnosed with prostate cancer: results from a national survey. *Eur Urol Focus*. 2020; 6:273-279.
13. Tu X, Lin T, Cai D, et al. The optimal core number and site for MRI-targeted biopsy of prostate? A systematic review and pooled analysis. *Minerva Urol Nefrol*. 2020; 72:144-151.
14. De Luca S, Fiori C, Bollito E, et al. Risk of Gleason Score 3 + 4 = 7 prostate cancer upgrading at radical prostatectomy is significantly reduced by target biopsy compared to standard biopsy technique. *Minerva Urol Nefrol*. 2020; 72:360-368.
15. Russo F, Manfredi M, Panebianco V, et al. Radiological Wheeler staging system: a retrospective cohort analysis to improve the local staging of prostate cancer with multiparametric MRI. *Minerva Urol Nefrol*. 2019; 71:264-272.
16. Kasivisvanathan V, Ambrosi A, Giganti F, et al. A dedicated prostate MRI teaching course improves the ability of the urologist to interpret clinically significant prostate cancer on multiparametric MRI. *Eur Urol*. 2019; 75:203-204.
17. Tooker GM, Truong H, Pinto PA, Siddiqui MM. National survey of patterns employing targeted MRI/US guided prostate biopsy in the diagnosis and staging of prostate cancer. *Curr Urol*. 2019; 12:97-103.
18. Kasivisvanathan V, Rannikko AS, Borghi M, et al. MRI-targeted or standard biopsy for prostate-cancer diagnosis. *N Engl J Med*. 2018; 378:1767-1777.
19. Caglic I, Kovac V, Barrett T. Multiparametric MRI - local staging of prostate cancer and beyond. *Radiol Oncol*. 2019; 53:159-170.
20. Glass AS, Dall' Era MA. Use of multiparametric magnetic resonance imaging in prostate cancer active surveillance. *BJU Int*. 2019; 124:730-737.
21. Fam MM, Yabes JG, Macleod LC, et al. Increasing utilization of multiparametric magnetic resonance imaging in prostate cancer active surveillance. *Urology*. 2019; 130:99-105.
22. Höfkes F, Arthanareeswaran VK, Stolzenburg JU, Ganzer R. Rate of misclassification in patients undergoing radical prostatectomy but fulfilling active surveillance criteria according to the European Association of Urology guidelines on prostate cancer: a high-volume center experience. *Minerva Urol Nefrol*. 2018; 70:588-593.
23. Puech P, Randazzo M, Ouzzane A, et al. How are we going to train a generation of radiologists (and urologists) to read prostate MRI? *Curr Opin Urol*. 2015; 25:522-535.
24. Stanzione A, Cuocolo R, Cocozza S, et al. Detection of extraprostatic extension of cancer on biparametric MRI combining texture analysis and machine learning: preliminary results. *Acad Radiol*. 2019; 26:1338-1344.
25. Cuocolo R, Stanzione A, Rusconi G, et al. PSA-density does not improve bi-parametric prostate MR detection of prostate cancer in a biopsy naïve patient population. *Eur J Radiol*. 2018; 104:64-70.
26. Salvaggio G, Calamia M, Purpura P, et al. Role of apparent diffusion coefficient values in prostate diseases characterization on diffusion-weighted magnetic resonance imaging. *Minerva Urol Nefrol*. 2019; 71:154-160.
27. Pepe P, Pepe L, Panella P, Pennisi M. Can multiparametric ultrasound improve cognitive MRI/TRUS fusion prostate biopsy. *Arch Ital Urol Androl*. 2020; 92:89-92
28. D'Agostino D, Mineo Bianchi F, Romagnoli D, et al. MRI/TRUS FUSION guided biopsy as first approach in ambulatory setting: Feasibility and performance of a new fusion device. *Arch Ital Urol Androl*. 2020; 91:211-217.
29. Lourenço M, Pissarra P, Brito DV, et al. Lesion location agreement between prostatic multiparametric magnetic resonance, cognitive fusion biopsy and radical prostatectomy piece. *Arch Ital Urol Androl*. 2020; 91:218-223.
30. D'Agostino D, Mineo Bianchi F, Romagnoli D, et al. Comparison between "In-bore" MRI guided prostate biopsy and standard ultrasound guided biopsy in the patient with suspicious prostate cancer: Preliminary results. *Arch Ital Urol Androl*. 2019; 91:87-92.

Correspondence

Arnaldo Stanzione, MD - arnaldostanzione@yahoo.it
 Massimo Imbriaco, MD - mimbriaco@hotmail.it
 Department of Advanced Biomedical Sciences, University of Naples "Federico II", Via Pansini 5, 80131 Naples (Italy)

Massimiliano Creta, MD (Corresponding Author) - max.creta@gmail.com
 Roberto La Rocca, MD - robertolarocca87@gmail.com
 Marco Capece, MD - drmarcocapece@gmail.com
 Fabio Esposito, MD - fabioesposito025@gmail.com
 Ciro Imbimbo, MD - ciro.imbimbo@unina.it
 Giuseppe Celentano, MD - dr.giuseppcelentano@gmail.com
 Luigi Napolitano, MD - lnuigi89@libero.it
 Francesco Mangiapia, MP - mangiapippo@libero.it
 Vincenzo Mirone, MD - mirone@unina.it
 Nicola Longo, MD - nicolalongo20@yahoo.it
 Department of Neurosciences, Reproductive Sciences and Odontostomatology, University of Naples "Federico II" - Via Pansini 5, 80131 Naples (Italy)

Ferdinando Fusco, MD - ferdinando-fusco@libero.it
 Department of Woman Child and of General and Specialist Surgery, University of Campania "Luigi Vanvitelli" - 80131 Naples (Italy)