Quality Assurance Improves Accuracy of MRI Prostate Detection in a Community Based Setting

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INTRODUCTION

- Multi-parametric magnetic resonance imaging (mpMRI) has assumed an increasing and important role in the diagnosis of prostate cancer
- Concerns have been raised about the variability in mpMRI interpretation and how this may impair the utility of MRI fusion biopsy in the diagnosis of prostate cancer
- AIM: This study was done to determine if a joint quality assurance process (QA) involving urologists and radiologists could impact the results of mpMRI directed fusion prostate biopsy at a single large independent urology practice (Integrated Medical Professionals, (IMP).

METHODS

- To reduce technical variability, IMP restricts performance of fusion biopsy to 5 of our group of 103 providers
- QM processes consist of urologists and interpreting radiologists cross-referencing biopsy results to MRI reads; this process commenced in 2015
- We assessed the positive biopsy rates for Pi-RADS 4 and 5 lesions (P4/5) as well as the negative biopsy rates for Pi-RADS 3 lesions (P3)
- Positive biopsy rates were assessed both between IMP providers performing fusion biopsy and radiology sites interpreting mpMRI

METHODS (cont'd)

- Some patients went to sites not participating in QA due to personal preference or for insurance reasons
- No financial relationship existed between IMP and any of the radiology centers
- Statistical analysis was performed using Student's t-test and two proportion z-test

RESULTS

- Between 2014-2018, a total 2098 patients underwent mpMRI guided fusion biopsy
- 1294 patients were in the QA group while 804 patients were in the non-QA group
- Positive biopsy rates were similar between providers
- Negative biopsy rates for P3 between groups were not significantly different in any year
- Read accuracy for both primary and all targets was higher in the QA vs. non-QA group for all years
- The difference between the QA and non-QA groups was 20.7% and 13.1% for all targets and 16.5% and 23.0% for primary targets in 2017 and 2018, respectively. This was significant ($p < 0.01$) for both years and both groups
- Positive biopsy rates for the QA group increased significantly ($p<0.01$) while the increase in positive biopsy rates for the non-QA group was not. ($p=0.07$)

RESULTS (cont'd)

- Biopsy accuracy for P4/5 primary targets improved 48.5% ($p=.04$) and 18.7% ($p=0.69$) in the QA and non-QA groups, respectively

Year	All P4/5		P4/5 Primary Target	
	QA	Non-QA	QA	Non-QA
2014	45.5%	36.4%	45.5%	37.5%
2015	51.5%	40.0%	51.6%	44.4%
2016	53.3%	46.1%	54.4%	48.4%
2017	**64.6%**	**43.9%**	**64.2%**	**47.6%**
2018	**66.3%**	**53.2%**	**67.5%**	**44.5%**

Table 1. Positive biopsy rate for P4/5 lesions in QA and non-QA groups from 2014 to 2018, primary and all targets. Data bolded in red denotes years where difference between QA and non-QA groups was significant

CONCLUSIONS

Institution of a standardized, ongoing review QA process correlating histopathological findings with radiological interpretation of mpMRI findings improves biopsy accuracy more rapidly and to greater degree than without such processes, particularly for lesions identified as the the primary biopsy target. These programs should be considered by all providers performing this procedure.