## Prostate Cancer: Detection and Screening I

## Moderated Poster 48

**Sunday, May 17, 2015** **1:00 PM-3:00 PM**

### MP48-01

### PREVALENCE OF ANTIBIOTIC RESISTANCE IN FECAL FLORA BEFORE TRANSRECTAL ULTRASOUND-GUIDED PROSTATE BIOPSY AND CLINICAL IMPACT OF TARGETED ANTIBIOTIC PROPHYLAXIS

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INTRODUCTION AND OBJECTIVES: In this study, we aimed to evaluate the clinical impact of targeted antibiotic prophylaxis on the sepsis rate after transrectal ultrasound guided prostate biopsy.

METHODS: Between September 2012 and January 2014, 300 patients were randomized to two groups, while the first group (Group 1, n=156) received routine ciprofloxacin prophylaxis, and the second group (Group 2, n=144) received targeted prophylactic antibiotic regime adequate to rectal swab culture results. Rectal swab cultures were taken two weeks before the procedure. After the procedure, patients were followed one month and told to apply hospital if they see any symptoms such as fever (>38 C), shivering, dysuria or fatigue.

RESULTS: Prostate specific antigen (PSA), prostate volume, digital rectal examination findings, pathology results and comorbidity rates were similar between two groups (Table 1.). While in Group 1 four patients (2.6%) applied to our clinic due to signs of sepsis, no patients (0%) applied to our clinic in Group 2 (p= 0.124). When rectal swab culture results of Group 2 were evaluated, ESBL presence in 18 patients (12.5%), quinolone resistance in 26 patients (18%), both the presence ESBL and quinolone resistance in 15 patients (10.4%) were observed. TMP-SMX to 6 patients, Cefuroxime to 10 patients, gentamicin to 4 patients, meropenem to 4 patients, amikacin to 1 patient and amoxicillin to 1 patient were received for prophylactic regimen who had fluoroquinolone resistant bacteria or ESBL. There were no statistically significance between antibiotic resistance and urologic operations, urinary tract infections, prior catheterization history, presence of catheter during prostate biopsy and antibiotic usage history due to high level of PSA.

CONCLUSIONS: In our study, it has also been detected that rates of ESBL presence and ciprofloxacin resistance in rectal flora were not negligible. On the other hand, with obtaining rectal swab culture prior transrectal prostate biopsies and the use of targeted prophylaxis before prostate biopsy it has been observed that sepsis rates were reduced but these results were statistically insignificant.

Clinical characteristics of patients

| | Group1-Mean | Group1-Median | Group2-Mean | Group2-Median | p |
|---|---|---|---|---|---|
| Age (year) | 63.6 ± 7.8 | 64 (45 - 83) | 62.9 ± 7.5 | 63 (43 - 86) | 0.446 |
| PSA (ng/ml) | 14.8 ± 38.5 | 7 (0.5 - 437) | 15 ± 43.7 | 7 (1 - 492) | 0.795 |
| Prostate volume (ml) | 52.2 ± 27.9 | 46 (10 - 152) | 50.3 ± 30.6 | 40 (9 - 177) | 0.228 |
| DRE benign | 84 (53.8%) | | 93 (64.6%) | | 0.059 |
| DRE malign | 72 (46.2%) | | 51 (35.4%) | | |
| Pathology - Benign | 94 (60.3%) | | 93 (64.6%) | | 0.665 |
| Pathology - ASAP | 17 (10.9%) | | 12 (8.3%) | | |
| Pathology - Malign | 45 (28.8%) | | 39 (27.1) | | |
| Comorbidity - total | 89 (57.1%) | | 86 (59.7%) | | 0.639 |
| Comorbidity - HT | 47 (30.1%) | | 58 (40.3%) | | 0.066 |
| Comorbidity - DM | 32 (20.5%) | | 36 (25.0%) | | 0.354 |
| Comorbidity - CAD | 21 (13.5%) | | 15 (10.4%) | | 0.417 |
| Comorbidity - CRF | 0 (0.0%) | | 2 (1.4%) | | 0.140 |
| Comorbidity - COPD | 9 (5.8%) | | 7 (4.9%) | | 0.727 |

Independent Sample t-test / Mann-Whitney U test / Chi-square test

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### MP48-02

### FLUORESCENCE SPECTROSCOPY CAN INCREASE DIAGNOSTIC YIELD OF PROSTATE BIOPSIES

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INTRODUCTION AND OBJECTIVES: Transrectal ultrasound (TRUS) guided prostate biopsy cores have a very low diagnostic yield as 90% cores are histopathologically classified as benign. We investigated potential clinical application fluorescence spectroscopy (FS) to increase diagnostic yield of TRUS biopsies. The fluorescence emissions from natural fluorophores (e.g., collagen) in prostate tissue are altered by the presence of prostate cancer (PCa). Thus, FS can be used to distinct malignant locations from benign to aid TRUS biopsies.

METHODS: 14G optical biopsy needle was prototyped to capture FS of prostate tissue. Integrated optical sensor uses 8x100 μm fibers for excitation and 1x200 μm fiber to collect FS data. Custom made fluorometers with 2 light-emitting diodes at 290 and 340 nm and a spectrometer were used to measure FS of prostate tissue. User interface for fluorometer operation and data collection was developed using LabView software. Each spectral data acquisition takes ~250 milliseconds. The in vivo biopsies were performed during radical prostatectomy surgery on the exposed prostate with blood flow to the gland intact. A tissue biopsy core was obtained from each biopsy site after acquisition of FS data. Above procedure was repeated ex vivo after surgical excision of the prostate. Biopsy cores were histopathologically classified as benign or malignant and correlated with corresponding FS data. Partial Least Square analysis of the FS data was performed to determine principal components (PCs) at each excitation wavelength. Using linear support vector machine and leave-one-out cross validation method, several combinations of PCs were tested for their ability to classify benign vs. malignant prostatic tissue.

RESULTS: Thirteen patients were consented. A total of 208 in vivo biopsies (29 malignant) and 224 ex vivo biopsies (51 malignant) were analyzed. Results for benign vs. malignant prostatic tissue classification based on number of PCs used are given in the table.

CONCLUSIONS: Our optical biopsy needle assisted with FS has a very high NPV to indicate benign tissue while sufficient SE and SP for real-time diagnosis of PCa by targeting areas positive for cancer within the prostate gland. Hence, systematic use of optical biopsies can potentially increase diagnostic yield of prostate biopsies.

**Table: Results for benign vs malignant prostate tissue classification**

| Study Type | *In Vivo* Study | | | *Ex Vivo* Study | | |
|---|---|---|---|---|---|---|
| Principal Components (PCs) | #1-5 | #1-7 | #1-10 | #1-5 | #1-7 | #1-10 |
| Sensitivity (SE) | 68% | 84% | 76% | 88% | 81% | 78% |
| Specificity (SP) | 80% | 90% | 90% | 92% | 95% | 97% |
| Negative Predictive Value (NPV) | **94%** | **97%** | **96%** | **97%** | **96%** | **95%** |
| Positive Predictive Value (PPV) | 37% | 60% | 58% | 72% | 79% | 83% |

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