Initial experience of photodynamic therapy in prostate cancer patients

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Introduction and objective: Photodynamic therapy (PDT) is one of the ablative microinvasive methods of cancer treatment which might be useful for patients with small volume prostate adenocarcinoma as an alternative to radical local treatment or watchful waiting. PDT may be an alternative method for patients with local recurrence after radical prostatectomy, external beam radiation, brahitherapy treatment.

The aim of our study was to develop method of PDT for prostate cancer (PC) patients and evaluate side effects of this procedure, treatment the all volume of prostate, minimal invasion, surrounding tissue protection.

Materials and methods: PDT was performed to fourteen patients with verified PC. For eleven pts PDT performed for local recurrence after external beam radiation therapy (six pts) and after radical prostatectomy (RPE) (five pts). Three pts have undergone PDT prior radical prostatectomy. For five pts PDT was performed in case localized low volume prostate tumors. Median PSA level was 6.25 ng/ml [min 0,5; max 10,2]. Gleason score was 4-6 for seven patients, 7 for four, 8-10 for one and was not assessed due to small volume of tissue for two patients. Mean patient's age was 64.8±7.2 years [min 56, max 78]. Median prostate volume was 29 cm³ [min 3, max 85]. Two hours before PDT photosensitizer – Photosens (sulfonated aluminum phthalocyanine, the producer is FSUE “SSC “NIOPIK”, Moscow, Russia) was injected intravenously. The light 675 nm from BIOSPEC's high-power diode laser systems LPhT-675-01-BIOSPEC was delivered to the prostate using optical fibers within transparent needles. Transrectal ultrasound (TRUS) guided installation of 4-7 needles (18 Gauge) was performed into the prostate gland to deliver optical fibers. The number of radiation points varied from 4 to 15. The needles and fibers were moved simultaneously to expose the whole volume of prostate gland. Light energy during PDT on one position was 200-500 J. Median PDT time was 27 minutes.

Results: We didn’t observe any complications during the procedure. Urethral catheter was removed on the 1-st day after PDT. In one patient we observed urinary irritation which needed prologue catheterization. We didn’t observe any specific complications (allergic, dermatological and laboratory abnormalities). Erection in patients with preserve function was not significantly affected. Mean time of hospital stay was 3±1 days. There were no pre and post-
operative complications in patients who had undergone radical prostatectomy after PDT. Follow up was 3-12 month. 6 months after PDT we observed decreasing of PSA level: 3.1 ng/ml [min 0.1; max 6.8]

**Conclusion:** From preliminary results obtained from a small number of patients we can conclude that PDT non invasive procedure with small adverse effects. PDT can be an alternative method treatment of patients not eligible to radical prostatectomy or external beam radiation therapy. The clinical trials will provide additional information of this method effectiveness. This work was supported by Moscow City Government.