Adjuvant photodynamic therapy with Alasens in combination with intravesical chemotherapy with Mitomicin C in patients with superficial bladder cancer.

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Introduction & Objectives: To develop technique and to assess results of combination treatment of patients with non-muscle-invasive bladder cancer (NMIBC) after transurethral resection (TUR) using photodynamic therapy (PDT) in combination with intravesical chemotherapy with Mitomicin C.

Material and methods: 25 patients (males - 17, females – 8) with intermediate risk NMIBC were included in the study. Patient’s age was 59.96 ± 8.2 years. 5-aminilevulinic acid hydrochloride (Alasens) (FSUE «SSC «NIOPIC», Russia), as photosensitizer, and diode laser with wave length of 630 nm («Biospec», Russia) were used for PDT. For introducing of laser radiation to the bladder through the cystoscopy silicon diffusers were used («CarlStorz», Germany). In all patients 50 ml of 3% of Alasens solution was intravesically instillated 1.5-2 hour before the operation.

First, TUR of bladder was performed with fluorescence navigation with Alasens, after that PDT was performed with irradiation of all bladder walls using energy devise with 25 J/cm². After PDT intravesical instillation of 40 mg of Mitimicin C was performed with exposure time of 1 hour. 7 after TUR 6 courses of adjuvant treatment of PDT with Alasens and instillation of Mitomicin C were performed with interval of 7 days between the courses. After that all patients underwent postoperative examination every 3 months with ultrasound, cystoscopy and urine cytology.

Moreover, in 14 patients Mitomicin C concentrations were assessed in normal and tumor tissue using high-performance liquid chromatography (HPLC). First, in all patients HPLC was performed after intravesical instillation of 40 mg of Mitomicin C with 1 hour exposure. After that biopsy of normal and tumor tissue was done to assess Mitomicin C tissue concentration with HPLC. 7 days after this procedure a PDT with Alasens was done in all 14 patients with radiation energy of 25 J/cm². Thereafter 1 hour Mitomicin C instillation was done. Biopsy of normal and tumor tissue was repeated to assess Mitomicin C tissue concentration with HPLC.

In control group 50 patients with intermediate risk NMIBC were included. Patients in all groups were compared by prognostic risk factors using EORTC criteria.

Results: Median Mitomicin C concentration, assessed using HPLC, before PDT with Alasens was 214.5 mkg/g and 98.0 mkg/g in tumor tissue. After PDT with Alasens median Mitomicin C concentration was 52.5 mkg/g in normal tissue and 130.5 mkg/g in tumor tissue. Median follow-up was 7.7 ± 3.6 months (2-15) in experimental group and 18.4 ± 14.7 months (1-8.8 months) in control one. No recurrence was observed in experimental group during the follow-up. In control group recurrence of bladder cancer was verified in 14 (28%) patients. Median time to recurrence in control group was 7 months. Moderate cystitis was observed in 12 of 25 (%) patients in experimental group during 3 months after the procedure. 1 patient (2%) had severe cystitis (grade 4) during 1 year after the procedure. No complications were observed in the control group.

Conclusions: A new and effective method of complex therapy of NMIBC with combination of TUR, PDT and Mitomicin C reduces risk of recurrence for bladder cancer and have minimal toxicity. This work was supported by Moscow City Government.