Methods that Lead to Increasing Mitomicyn C Concentration in Tumor Tissue Can Enhance Recurrence-Free Survival in Patients with Non-muscle Invasive Bladder Cancer

Introduction and Objective: Risk of recurrence in patients with non-muscle invasive bladder cancer (NMIBC) is high. Development of techniques to prevent disease recurrence is actual. The aim of our study was to assess results of adjuvant IVC with Mitomycin C (MMC) in combination with photodynamic therapy (PDT) or low level laser therapy (LLLT) in patients with NMIBC intermediate risk.
Materials and methods: From 2006 to 2010 131 patients with intermediate risk NMIBC were included in the study. Experimental preclinical part of the study included 27 patients in whom concentrations of MMC in tumor and normal tissue were assessed after standard IVC with PDT/LLLT using method of high effective liquid chromatography (HELC). Control (retrospective) arm included 54 patients received TUR+6 courses of IVC. In experimental arm A 25 patients received 6 courses of IVC+PDT as adjuvant treatment. In experimental arm B 25 patients received 6 courses IVC+LLLT. Patients in all groups were comparable by prognostic risk factors using EORTC criteria. The patients with carcinoma in situ were excluded from this study.
Results: Results of HELC have demonstrated that median MMC concentration in normal tissue was 197mkg/g after IVC; 33.5mkg/g (IVC+PDT) and 67mkg/g (IVC+LLLT). Median MMC concentration in tumor tissue was 101mkg/g (IVC), 42mkg/g (IVC+PDT) and 128mkg/g (IVC+LLLT) ($p=0.0002$). In control arm median follow-up was 33 months. During this period recurrence was diagnosed in 28 (52%) patients, median recurrence free survival (RFS) was 32.5 months. In experimental arm A median follow-up was 27 months. During this period recurrence was diagnosed in 1 patient (4%), median RFS was 24 months. In experimental arm B median follow-up was 29 months. Recurrence in this group of patients was also diagnosed in 1 case (4%) with median RFS of 27 months. RFS rates in two experimental arms were significantly higher than in control arm ($p<0.0001$). Complications of combination therapy were similar in control and two experimental groups of patients ($p=0.46$).
Conclusions: IVC in combination with PDT and LLLT are perspective methods of treatment of patients with intermediate risk NMIBC. These methods are not associated with increased risk of complications and could be recommended in clinical practice.