Research article

R.N.Molchanov
I.S.Shponka

State establishment "Dnipropetrovsk Medical Academy of Health Ministry of Ukraine"

Key words: bladder tumor, inflammation, tumor infiltrating immunocyte

Received: 20.05.2014
Accepted: 23.06.2014

UDC: 616.62-006-003.2: 577.27:616.9

INFLUENCE OF URINARY TRACT INFECTION ON INFILTRATION OF BLADDER TUMORS BY IMMUNE CELLS

The study was performed as a part of research work "Studying the influence of inflammatory process on origin and development of cancer in the organs of genito-urinary system" (state registration number 0103U002379).

ABSTRACT. Background. Tumor-infiltrating immune cells have been associated with outcomes in various tumors, including urothelial carcinoma. It is supposed that the accompanying urinary infection can influence the local immunity activity, leading to changes of features of bladder tumor course. **Objective** of the research was studying of the urinary tract infection influence on an infiltration of a tumor with immune cells. **Methods.** Immunohistochemical research of CD3+, CD4+, CD8+, CD20+, CD68+ markers expression in tumor specimens, received from 44 patients with a bladder cancer was made. The patients were divided on two groups in conformity with absence (I) or presence (II) of urinary tract infection**. Results.** It is established that in group I specimens 96,0±4,9 % CD3+, 98,6±0,9% CD4+, 82,6±12,6% CD8+ and 78,7±9,29% CD68+ immunocytes were revealed in stromal compartment of tumor, while in group II - 97,0±2,1%, 98,3±0,8% и 84,4±13,1% and 81,9±6,2% respectively. The difference was not statistically significant (p>0,05). CD20+ cells were revealed only in stromal compartment of tumor, and they formed foci in group II specimens (p>0,05). **Conclusion.** T-cells are prevailing among immunocytes, infiltrating a superficial bladder cancer. In stromal compartment prevail CD4+, while in epithelial - CD8+ T-lymphocytes and CD68+ macrophages. The accompanying urinary tract infection had no statistically significant influence on intensity and selectivity of infiltration of a tissue of tumor with CD3+, CD4+, CD8+, CD68+ immunocytes. The significant augmentation of infiltration of the stromal compartment of tumor with CD20+ B-lymphocytes with formation of lymphatic follicles in patients with urinary tract infection, can be an element of a chronic interstitial inflammation.

✉ **rob_molch@yahoo.com**

Citation:
Molchanov RN, Shponka IS. [Influence of urinary tract infection on infiltration of bladder tumors by immune cells]. Morphologia. 2014;8(2):37-44. Russian.

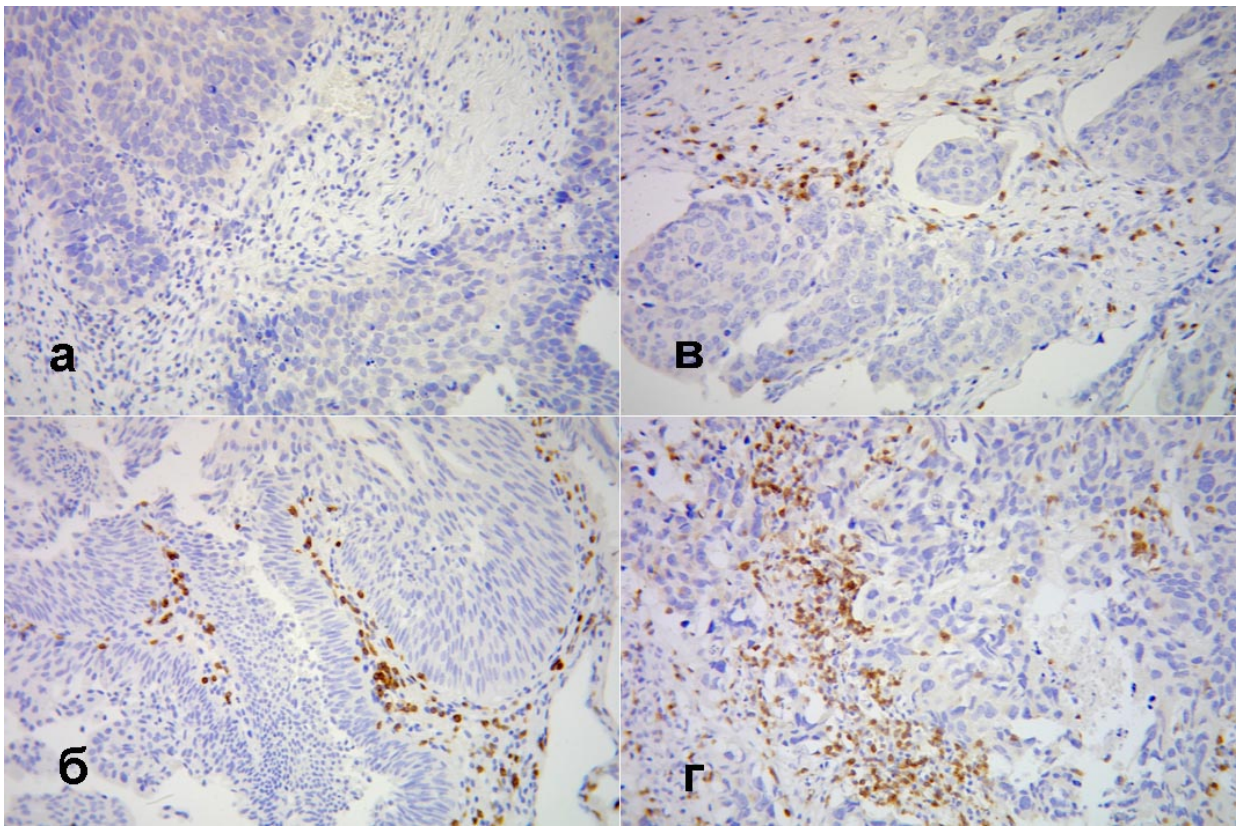

Fig. 1. Cancer of bladder. Severity of tumor infiltration by immune cells (CD3+). Immunohistochemical reaction, additional staining with Mayer's hematoxylin. ×100.

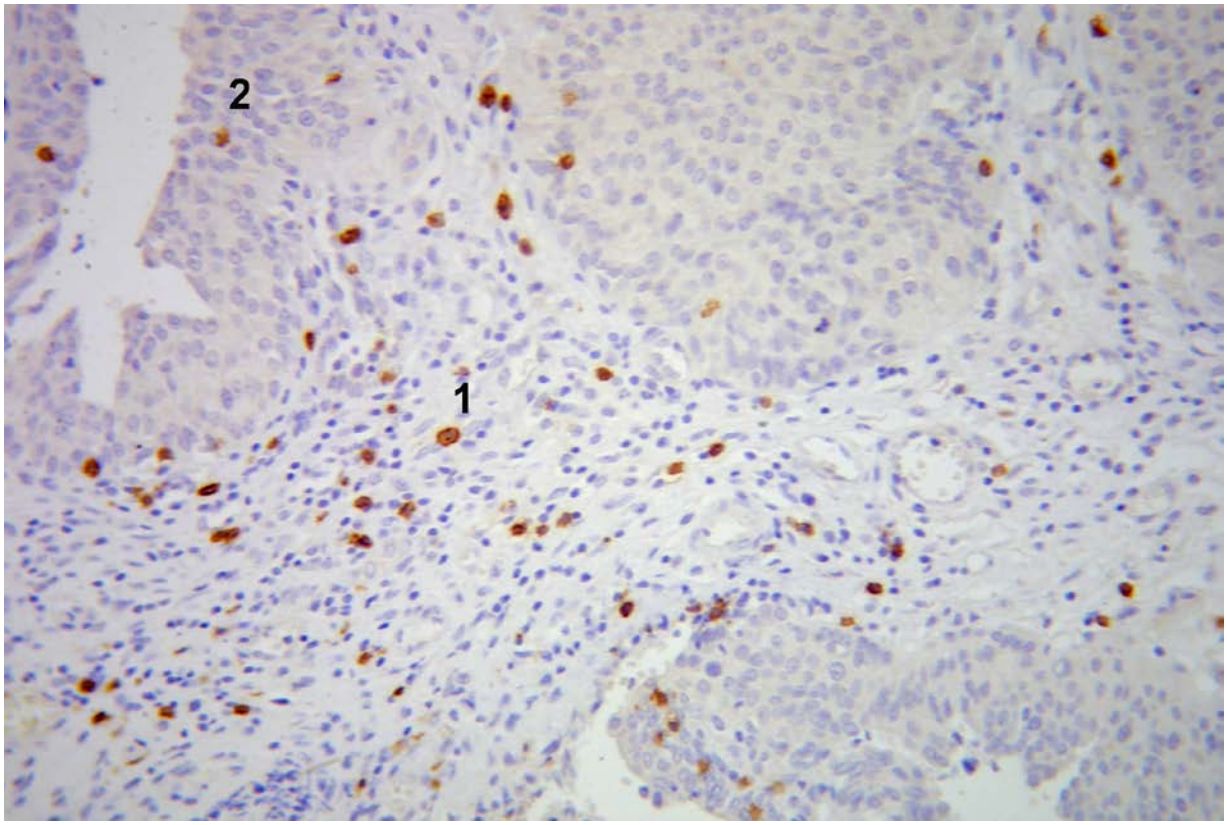

Fig. 2. Cancer of bladder. CD8+ lymphocytes in stromal (1) and epithelial (2) parts of the tumor. Immunohistochemical reaction, additional staining with Mayer's hematoxylin. ×200.

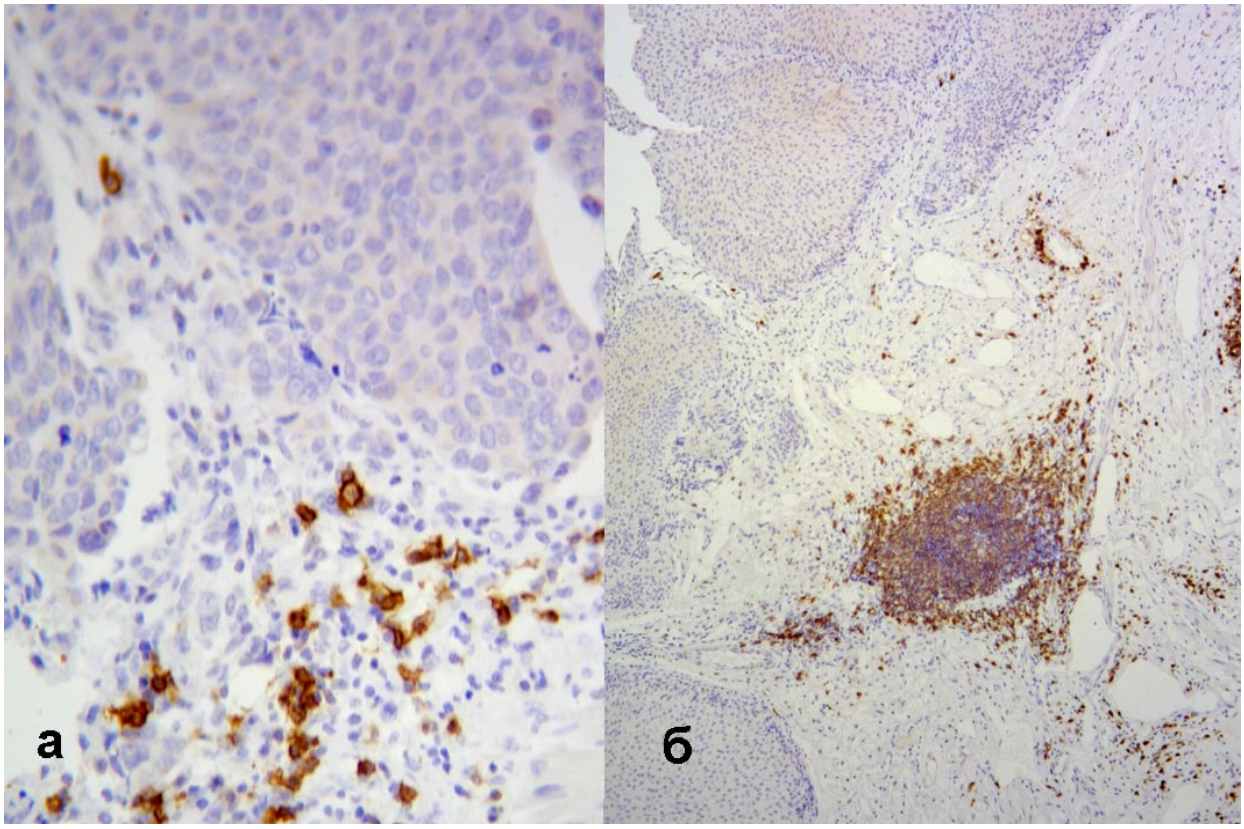

Fig. 3. Cancer of bladder. CD20+ cells in tumor stroma (a) (×400), formation of lymphoid follicles (b) (×100). Immunohistochemical reaction, additional staining with Mayer's hematoxylin.

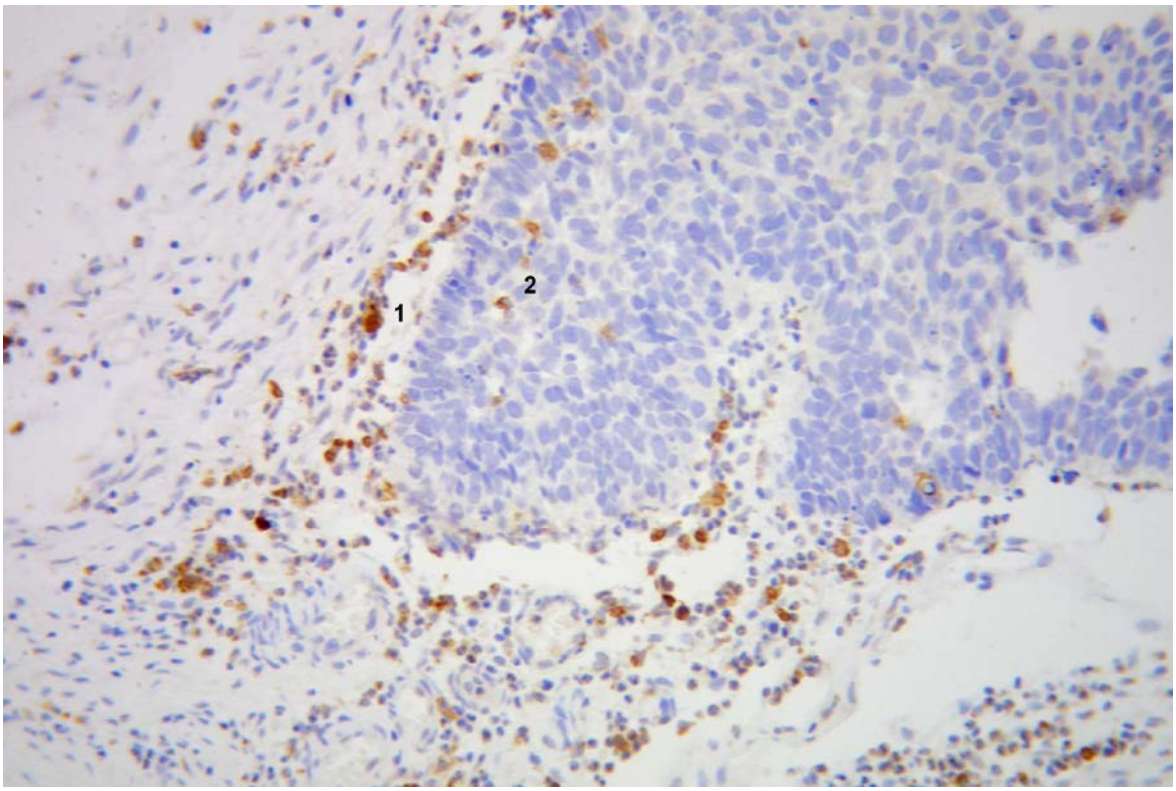

Fig. 4. Cancer of bladder. CD68+ cells in tumor stroma (1), in epithelium (2). Immunohistochemical reaction, additional staining with Mayer's hematoxylin. ×400.

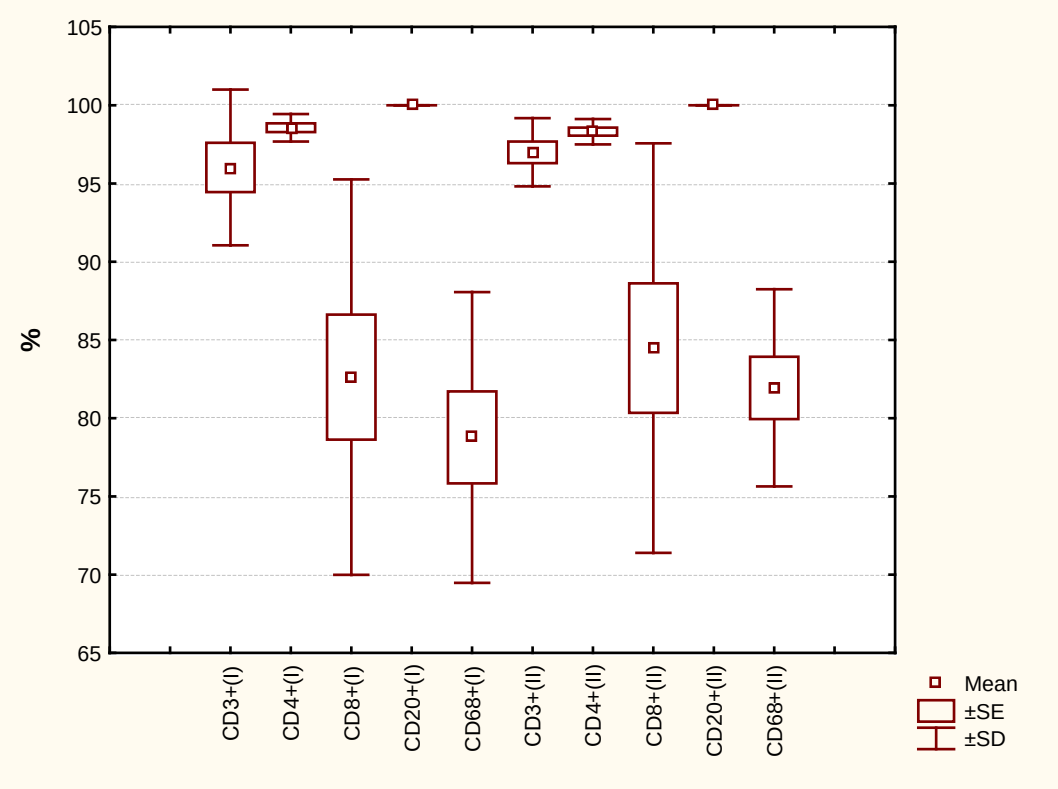

Fig. 5. Content of immune cells in tumor stroma (%). Note: Mean – mediana (M), SE – standard error, SD – standard deviation (m).

References:

1. Jemal A, Siegel R, Ward E, Hao Y, Xu J, Thun MJ. Cancer statistics, 2009. CA Cancer J Clin. 2009;59(4):225-49. Epub 2009/05/29. doi: caac.20006 [pii] 10.3322/caac.20006. PubMed PMID: 19474385.
2. Liakou CI, Narayanan S, Ng Tang D, Logothetis CJ, Sharma P. Focus on TILs: Prognostic significance of tumor infiltrating lymphocytes in human bladder cancer. Cancer Immun. 2007;7:10. Epub 2007/06/27. PubMed PMID: 17591743; PubMed Central PMCID: PMC2935746.
3. Krpina K, Babarovic E, Dordevic G, Fuckar Z, Jonjic N. The association between the recurrence of solitary non-muscle invasive bladder cancer and tumor infiltrating lymphocytes. Croatian medical journal. 2012;53(6):598-604. Epub 2013/01/01. PubMed PMID: 23275325.
4. Sjodahl G, Lovgren K, Lauss M, Chebil G, Patschan O, Gudjonsson S, et al. Infiltration of CD3 and CD68 cells in bladder cancer is subtype specific and affects the outcome of patients with muscle-invasive tumors. Urologic oncology. 2014. Epub 2014/05/06. doi: 10.1016/j.urolonc.2014.02.007. PubMed PMID: 24794251.
5. Odunsi K, Old LJ. Tumor infiltrating lymphocytes: indicators of tumor-related immune responses. Cancer Immun. 2007;7:3. Epub 2007/02/22. doi: 061215 [pii]. PubMed PMID: 17311362; PubMed Central PMCID: PMC2935754.
6. Erdurak K, Dundar PE, Ozyurt BC, Negri E, La Vecchia C, Tay Z. Smoking, occupation, history of selected diseases and bladder cancer risk in Manisa, Turkey. European journal of cancer prevention. 2014;23(1):58-61. Epub 2013/06/22. doi: 10.1097/CEJ.0b013e3283631dde.
7. Redelman-Sidi G, Glickman MS, Bochner BH. The mechanism of action of BCG therapy for bladder cancer – a current perspective. Nature reviews Urology. 2014;11(3):153-62. Epub 2014/02/05. PubMed PMID: 24492433.
8. Mitropoulos DN. Novel insights into the mechanism of action of intravesical immunomodulators. In vivo. 2005;19(3):611-21. Epub 2005/05/07. PubMed PMID: 15875784.
9. Cresswell J, Robertson H, Neal DE, Griffiths TR, Kirby JA. Distribution of lymphocytes of the alpha(E)beta(7) phenotype and E-cadherin in normal human urothelium and bladder carcinomas. Clin Exp Immunol. 2001;126(3):397-402. Epub 2001/12/12. doi: 1652 [pii]. PubMed PMID: 11737053; PubMed Central PMCID: PMC1906227.
10. Baseskiogulu B, Canaz F, Kaya C, Donmez T. The type of lymphocyte infiltration near urothelial carcinoma is diagnostic for chronic lymphocytic leukemia. Urology annals. 2013;5(1):47-9.
11. Gamper M, Viereck V, Eberhard J, Binder J, Moll C, Welter J, et al. Local immune response in bladder pain syndrome/interstitial cystitis ESSIC type 3C. International urogynecology journal. 2013;24(12):2049-57.

12. Leibovici D, Grossman HB, Dinney CP, Millikan RE, Lerner S, Wang Y, et al. Polymorphisms in inflammation genes and bladder cancer: from initiation to recurrence, progression, and survival. J Clin Oncol. 2005;23(24):5746-56. Epub 2005/08/20. doi: 10.1200/JCO.2005.01.598. PubMed PMID: 16110031.

13. Mantovani A. Tumor-associated macrophages in cancer-related inflammation. Immunotherapy 2011;3(4 Suppl. 1):21-2.

14. Takayama H, Nishimura K, Tsujimura A, Nakai Y, Nakayama M, Aozasa K. Increased infiltration of tumor associated macrophages is associated with poor prognosis of bladder carcinoma in situ after intravesical bacillus Calmette-Guerin instillation. The Journal of urology. 2009;181(4):1894-900.

15. Hanada T, Nakagawa M, Emoto A, Nomura T, Nasu N, Nomura Y. Prognostic value of tumor-associated macrophage count in human bladder cancer. Int J Urol. 2000;7(7):263-9. Epub 2000/07/26. PubMed PMID: 10910229.