ABSTRACT

Proliferation of the urothelium, the inner epithelial lining of the bladder is very low under normal conditions but may increase during wound healing and inflammation. In the present study, proliferation in the urinary bladder in response to inflammation was assessed by using two experimental models for cystitis. In order to induce bladder inflammation, cyclophosphamide (CYP; 100 mg/kg intraperitoneally) or E. coli lipopolysaccharide (100 μg/kg intravesically) were administered to female rats. 20 and 56 hours later, rats were administered the synthetic nucleotide bromodeoxyuridine (BrdU, 50 mg/kg) and 4 hours later the rats were killed. In order to detect proliferation in the urothelium, immunohistochemistry was performed on the expression of the proliferation markers Ki-67 and BrdU. Signs of bladder inflammation (bladder wall thickening and hemorrhages) were observed both at 24 and 60 hours after CYP pre-treatment. After 24 hours, proliferation was observed in the urothelial layer of the bladder. After 60 hours, proliferation in the urothelium was decreased but appeared instead in the submucosa. Intravesical administration of LPS failed to induce bladder inflammation. The present study shows that the urinary bladder may attain a dynamic regenerative capacity in response to inflammation. Further studies are needed to assess which cells that are proliferating in the mucosa and submucosa during inflammation.