Effect of Methylene Blue on the Vesicourethral Function in the Rats

OSAMU NISHIZAWA, TOSHIYUKI KAWAHARA, NAOTAKE SHIMODA, KAZUMASA SUZUKI, NOBUO FUJIEDA, TAKAMASA KUDO, TAKASHI SUZUKI, HIROMITSU NOTO, TADASHI HARADA and SEIGI TSUCHIDA

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NISHIZAWA, O., KAWAHARA, T., SHIMODA, N., SUZUKI, K., FUJIEDA, N., KUDO, T., SUZUKI, T., NOTO, H., HARADA, T. and TSUCHIDA, S. Effect of Methylene Blue on the Vesicourethral Function in the Rats. Tohoku J. Exp. Med., 1992, 168 (4), 621-622 — The bladder and urethral activities during the rhythmic bladder contractions were evaluated before and after the intraarterial administration of methylene blue, which prevents the activation of soluble guanylate cyclase. The methylene blue produced an increase in the bladder activity and a decrease in the urethral smooth muscle relaxant response induced with bladder contraction. The L-arginine/nitric oxide pathway seems to modulate the vesicourethral function.

Fig. 1 shows a representative recording. Methylene blue produced an increase in the bladder ; urethra ; nitric oxide
bladder activity and a decrease in the urethral smooth muscle relaxant responses. The nitric oxide derived from L-arginine activates soluble guanylate cyclase in smooth muscle leading to accumulation of cyclic guanosine monophosphate (c-GMP), and results in the smooth muscle relaxation. Since methylene blue prevents the activation of soluble guanylate cyclase, alteration of bladder and urethral smooth muscle activities produced by methylene blue reflects a depressed action of the L-arginine/nitric oxide pathway. This study suggests that L-arginine/nitric oxide pathway modulates the vesicourethral function in anesthetized rats.

References