Repeated intensification of lower urinary tract symptoms in the patient with benign prostatic hyperplasia during bisoprolol treatment

Nasilenie dolegliwości ze strony dolnych dróg moczowych u chorego z łagodnym przerostem gruczołu krokowego podczas terapii bisoprololem

A case of a 60-year-old male patient, suffering from benign prostatic hyperplasia (BPH), with deterioration of lower urinary tract symptoms (LUTS) during antihypertensive treatment with bisoprolol was presented. Discontinuation of beta-blocker resulted in giving a relief whereas the resumption of its use caused repeated deterioration. Conclusion: Bisoprolol deteriorated lower urinary tract symptoms in patient with benign prostatic hyperplasia. Increase of lower urinary tract symptoms caused by beta-blockers can be more significant in elderly men.

**Case report**

In April 2004 a 60-year-old male patient was admitted to the Clinic of Acute Poisonings Medical University of Gdańsk with lower urinary tract symptoms (LUTS) suggesting benign prostatic hyperplasia (BPH). The patient complained of urinary frequency, urgency, nocturia, incomplete bladder emptying and a weak stream of urine lasting for about six months. Moreover the patient suffered from hypertension for more than three years but was only antihypertensive drugs (amlodypine, enalapril, hydrochlorothiazide) irregularly.

On admission the patient was in a good general condition. The arterial blood pressure varied from 145/95 mmHg to 150/100 mmHg and the heart rate was regular from 68 to 72 beats/min. There were no significant changes in basic biochemical tests, urinalysis, urine bacterial culture, echocardiography, chest X-ray and ophthalmological examination. Abdomen ultrasound revealed insignificant increase of prostate gland (40 ml volume, 51x34x43 millimeters dimensions) and lack of complete urinary bladder emptying.

Prostate specific antigen (PSA) level was 0.48 ng/ml and the patient had 20 points according to American Urological Association’s Symptom Index (AUASI) [1].

Five weeks before admission to the Clinic bisoprolol in a dosage of 10 mg per day (Bisocard 10 mg, ICN Polfa Rzeszów) was included as a single drug to antihypertensive therapy. The symptoms of LUTS were closely connected with the initial treatment with bisoprolol. After discontinuation of beta-blocker in the clinic the patient had less symptoms of LUTS. The follow up after 4 weeks with AUASI score showed significant clinical improvement (5 points in AUASI). Resumption of the use of bisoprolol caused repeated deterioration of the symptoms (the patient had 21 points in AUASI score after one month).

During the test of discontinuation and after discharge from the clinic blood pressure was controlled with enalapril in a dose of 2 x 5 mg per day and the arterial blood pressure varied from 125/80 mmHg to 135/85 mmHg. After two months of further observation the arterial blood pressure did not exceed 140/90 mmHg and the patient had 3 points in AUASI scale.

**Discussion**

Generally there is a three-component model responsible for BPH-induced lower urinary tract symptoms. This model involves the static (increased prostatic tissue mass), dynamic (increased prostatic smooth muscle tone) and detrusor-related component [10]. Almost 50% of patients with BPH also experience involuntary detrusor contractions that lead to histological alterations in bladder musculature, decreased bladder compliance, and compromised detrusor contractile strength. These foregoing changes can also be the reason for incomplete emptying, urgency, and frequency [3].

The human and animal studies revealed that the relaxation of bladder muscle is mediated by beta-adrenoceptors [2,4,5,7,8,11,12]. In the described case there was observed a close relation between the therapy of beta-blocker agent and LUTS escalation. It seems that bisoprolol influenced not only the relaxing function of bladder but also in beta-adrenoceptor-mediated relaxation of hyperplastic prostatic tissues. The foregoing mechanism written by Tsuji et al. was...
responsible for appearance of lower urinary tract symptoms in addition to mechanical compression of the urethra by the enlarged prostate [9].

The age of the patient could be the additional factor which intensified adverse effect of bisoprolol. Li et al. affirmed that there is an age-related decline in beta-adrenergic responsiveness of bladder muscle and additional administration of beta-blocker agents may increase the symptoms of LUTS [6].

Further studies are necessary to evaluate the influence of beta-adrenoceptor antagonists on symptoms of LUTS and BPH.

Conclusion
Bisoprolol deteriorated lower urinary tract symptoms in patient with benign prostatic hyperplasia. Increase of lower urinary tract symptoms caused by beta-blockers can be more significant in elderly men.

References

Score Key:
Mild = 0 to 7 points; Moderate = 8 to 9 points; Severe = 20 to 35 points