

FREQUENCY AS A PROTECTION FROM ACUTE URINARY RETENTION (AUR) IN MEN WITH BENIGN PROSTATIC ENLARGEMENT (BPE). THEORETICAL STUDY.

Hypothesis / aims of study

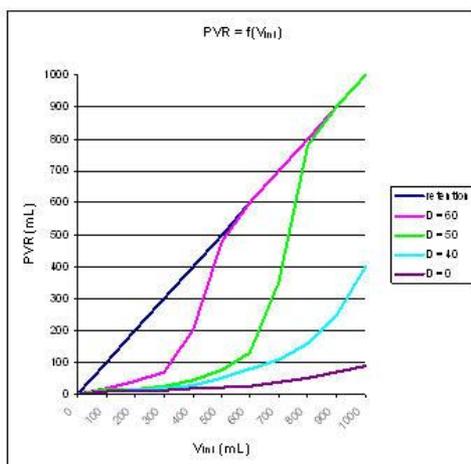
BPE is a common condition in the aging man. Symptoms are classified as storage and voiding. Storage symptoms, frequency with or without urgency, are associated with voiding ones and the major complication is acute urinary retention (AUR). If the analysis of maximum flow rate (Q_{max}) is currently used as a marker to evaluate the degree of bladder outlet obstruction (BOO), it has been demonstrated that the index D [1] is a challenger for Q_{max} . D is obtained from free uroflows and is more precise than Q_{max} because it is independent of volume and of perturbations of short durations. Our purpose was to search for a correlation between the value of the D index, the risk of AUR and to evaluate the protective role of frequency against AUR.

Study design, materials and methods

In clinical practice, D is obtained from free uroflows using the VBN mathematical micturition model [2]. This study is a theoretical one. Simulations of voidings were performed using the VBN model. For a large range of initial bladder volume (V_{ini}) and various D values (from non obstructed to large BOO) the post residual volume (PVR) was computed allowing to build a nomogram $PVR = f(V_{ini})$ which described the occurrence of AUR.

Results

The nomogram described the occurrence of AUR (blue line $PVR = V_{ini}$) for initial bladder volumes V_{ini} in the range 0-1000 mL and D values in the range 0-60.



These theoretical computations show that for low BOO ($0 < D < 40$) AUR would be observed for very great (non physiological) V_{ini} . For significant BOO, AUR occurred in a short range of V_{ini} . The brisk increase of the slope of a curve $PVR(V_{ini})$ for a given value of D will represent the danger zone. Thus, for $D = 60$, PVR was significant for $V_{ini} = 300$ mL and retention will occur for $V_{ini} = 500$ mL.

Interpretation of results

In BPE patients, BOO induces some changes in detrusor structure and function, resulting in a re-organisation of the spinal micturition reflex. When bladder overactivity is the consequence of BOO, its symptoms of urgency and frequency prevent from large PVR and AUR. In absence of urgency, patient becomes at-risk of AUR as AUR results from a situation that permits the bladder to overdistend. If a BOO patient with no complaint of urgency wait for voiding his bladder volume increases too much and reaches the danger zone.

Concluding message

In BPE patients, concomitant existence of symptoms of urgency and frequency appears as an unexpected physiological response to the risk of AUR. In BPE patients without symptom of urgency, frequency can be a protective behavior from AUR.

References

1. BJU Int 2008; 101: 995-9
2. NAU 2000; 19: 153-76

Disclosures

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