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AGE CHANGES IN SYMPTOMS AND FILLING AND VOIDING PARAMETERS IN MALES

Aim of Study: Increasing prevalence of detrusor instability (DI), lowered urethral pressures, impaired contractility and increased outlet obstruction are characteristic of the lower urinary tract in the elderly male (>65 yrs.). This study aimed to evaluate changes and trends in urodynamic parameters for males over a larger age spectrum.

Methods: Prospective urodynamic data from 5499 symptomatic males, mean age 56 yrs., range 20 to 89 yrs. (excluding men with neuropathy and/or with in-dwelling catheter) were collected to assess age related changes. For the purpose of this study the following symptom, filling, voiding and contractility data were analysed. Nocturia, urgency and poor stream were assessed. Filling function was assessed by maximum cystometric and effective capacity, compliance, end fill pressure and detrusor stability. Voiding function was assessed by peak flowrate (Q_{max}), void pressure at peak flowrate ($P_{det}.Q_{max}$), pre-test residual urine volume and fluoroscopically confirmed bladder outlet obstruction (BOO). Statistical analysis of these variables (comparison of decade means with one-way ANOVA and general factorial ANOVA models identifying contribution from linear and higher order terms) yielded trends and period of greatest change as well as any significant DI and BOO effects.

Results:

Symptoms: The proportion of patients presenting with nocturia, urgency and poor stream increased with age, p<.0001. Urgency symptoms increased at the same rate with each decade p<.0001, while nocturia and stream symptoms showed greatest increase in prevalence up to decade 5, p<.0001 (problems with urinary stream were as prevalent at decade 5 as at decade 9, p<.0001). DI was only associated with urgency symptoms, p<.0001. BOO was only associated with poor stream (p<.0001) but not with nocturia or urgency.

Filling Cystometry: Mean values of cystometric and effective capacity and compliance increased to a peak at decade 6 then fell, p<.0001. End fill pressure fell to a minimum at decade 5 then increased, p<.0001. DI was associated with lower cystometric and effective capacity, compliance and higher end fill pressures, p<.0001. The stable detrusor was not associated with age changes in end fill pressures. BOO was associated with lower compliance and higher end fill pressures and effective capacity, p<.0001. There was no association between BOO and mean cystometric capacity. The ratio of unstable to stable patients (unstable n= 3132, stable n=2294, other n=73) increased with age (from 50% at decade 4 to 70% at decade 9) with greatest changes in later decades p<.0001 unrelated to presence or absence of BOO.

Voiding Function: Q_{max} decreased with age (p<.0001) and pre-test residuum also decreased to decade 5 before increasing, p=.005. $P_{det}.Q_{max}$ increased up to decade 5 then fell, p<.0001. Both DI and BOO were associated with lower Q_{max} and higher $P_{det}.Q_{max}$ p<.0001. BOO was also associated with higher residuals, p=.004. Unobstructed patients showed no decrease in flowrate until after decade 6 at a time when contractility parameters $WF.Q_{max}$ and Schafer detrusor contraction strength coefficient (LPURRDECO) decreased in this group. The ratio of obstructed to unobstructed patients (obstructed n= 3939, unobstructed n= 1560) increased to 80% at decade 6 before falling to 65% at decade 9, p<.0001; mean AG number and Schafer obstruction coefficient (LPURROCO) analysed by decade, followed similar trends, p<.0001. Among the patients with BOO, the proportion of prostatic to bladder neck obstruction increased from 13% at decade 5 to 80% at decade 9, p<.0001.

Conclusions: Urodynamic findings and symptoms classically associated with the elderly male are extensions of trends which begin earlier in life; urgency increased steadily from decade 3, whereas nocturia and poor stream increased most markedly during decades 3 to 6. In symptomatic men, DI increased in prevalence from decade 4 but was not consistently correlated with BOO; DI rises with age in both obstructed and unobstructed male patients. Obstructive findings rise in prevalence in 30-40 year old men with bladder neck obstruction predominant at this age. All urodynamic parameters except Q_{max} were bimodal in changes associated with age: capacity, compliance, voiding pressure and outlet obstruction increased to a peak in 50-60 year old men, then decreased in elderly years with residuum and end fill pressures decreasing in earlier years and increasing in later years. However, changes in findings and symptoms cannot be properly interpreted independently of DI and BOO both of which not only significantly lower capacity, compliance and Q_{max} and increase $P_{det}.Q_{max}$ but also have significant effect on the changes of these parameters that are related to age.