131

Valentini F[1], Nelson P[1]
1. *Université Pierre et Marie Curie - Hôpital Rothschild, Paris (France)*

APPLICATION OF THE D INDEX: NOMOGRAMS ALLOWING EVALUATION OF BLADDER OUTLET OBSTRUCTION (BOO) IN MEN FROM FREE UROFLOWS (FF)

Hypothesis / aims of study

Benign prostatic enlargement (BPE) and its consequences, BOO and acute urinary retention (AUR) are a common condition in the aging man. Abrams-Griffiths number (A-G) is considered as the gold standard to evaluate BOO. Unfortunately it needs invasive investigation.

The D index derived from FF has been has been developed to assist in the management of BPE patients [1]. Our purpose was to build nomograms, based on D (non invasive) to evaluate BOO in men, and usable by a general practitioner.

Study design, materials and methods

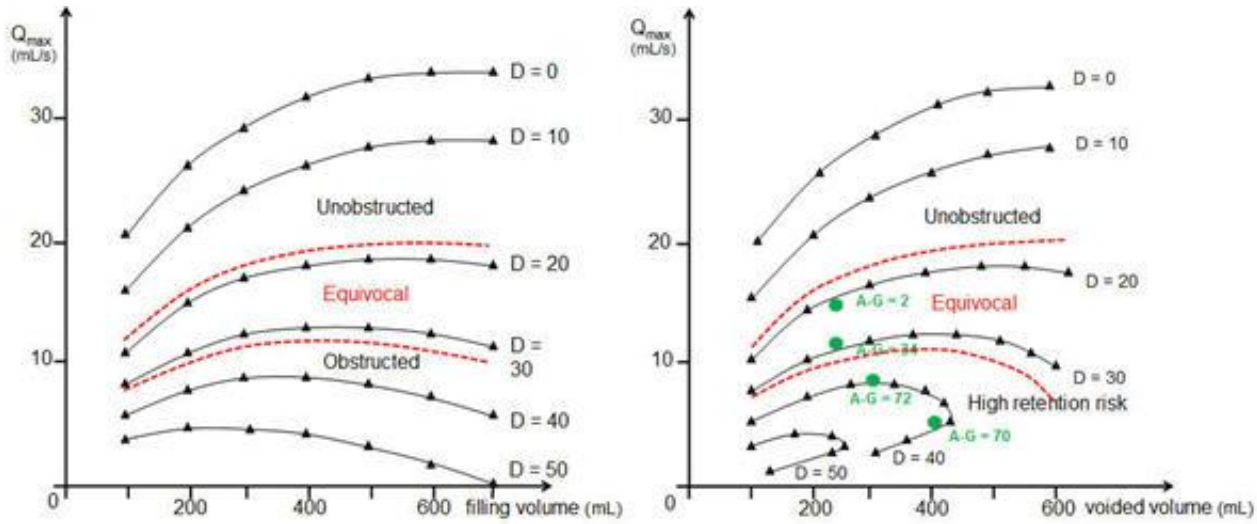
The VBN mathematical micturition model [2] was applied to analyze families of possible voidings having the same filling volume (V_{ini}) and the same flow curve but different detrusor pressure curves [1]. All had the same maximum flow rate (Q_{max}), voided volume (V_v) and post-void residual (PVR). One family was characterized by a value of D index (prostatic obstruction assuming a normal detrusor contractility i.e. k = 1) [1]. The value of D was a characteristic of a given patient and thus independent of the filling volume [1].

Simulations were performed for the V_{ini} range [100-700 mL]. Then, nomograms were built in the planes [V_{ini} - Q_{max} and V_v - Q_{max}]. Correlation D (in cm H_2O) vs. A-G was <18.5 unobstructed, 18.5≤D≤32.5 equivocal, D>32.5 obstructed [1].

Examples of comparisons with A-G cut-off values were made.

Results

Iso-D curves in the plane [V_{ini} - Q_{max}] (left) and in the plane [V_v - Q_{max}] (right) were built. Algebraic fitting of the curves allowed accurate interpolations between curves. In red boundaries describe the A-G cut-off values. Four examples are given (green circles) of D vs. A-G.



Interpretation of results

Non-invasive evaluation of BOO in man remains a great challenge. Main proposals are ultrasound measurements and elaborate devices such as penile cuff and condom catheter [3]. Unfortunately, all methods imply sophisticated, sometimes expensive equipments which cannot be available in primary care structures.

The D index is more informative than Q_{max}, is stable over time in healthy subjects, improved in patients treated with TURP or receiving medical therapy [1].

Use of the proposed nomograms only requires basic devices: flow-meter if the voided volume is analyzed, or, slightly more sophisticated, flow-meter plus bladder scan if the filling volume is analyzed.

Concluding message

For the first time, nomograms only based on FF, thus needing few instrumental devices (flow meter ± bladder scan) and thus usable by a general practitioner, are proposed for evaluation of BOO in BPE men. This new, cheap, method could make easier watchful waiting and follow-up of chemical or surgical treatment. Further studies will be devoted to large clinical applications.

References

1. Valentini FA, Nelson PP, Besson GR, Zimmern PE. Challenging the maximum flow rate: a new index of voiding dysfunction in men with benign prostatic enlargement. BJUInt 2008; 101: 995-999.
2. Valentini FA, Besson GR, Nelson PP, Zimmern PE. Clinically relevant modelling of urodynamics function: The VBN model. NAU 2014; 33(3): 361-66. doi 10.1002/nau.22409
3. Valentini FA, Nelson PP, Robain G. Non-invasive techniques in urodynamics : an update. AoU 2011 II (1) 10-16

Disclosures
Funding: None **Clinical Trial:** No **Subjects:** NONE