

DHIC REVISITED: UNRAVELLING THE COMPLEXITY OF A COMMON GERIATRIC CONDITION

Hypothesis / aims of study

Urinary incontinence is a geriatric syndrome attributable to the combined impact of multiple morbidities and diminished homeostatic reserve. Twenty-six years ago, "Detrusor Hyperreflexia with Impaired Contractility" (DHIC) was shown to represent the most common urodynamic presentation among incontinent nursing home residents [1]. The combination of disordered bladder filling with abnormal bladder emptying not attributable to obstruction remains a vexing clinical problem. Confusion over symptoms, diagnosis and pathophysiology has hampered the development of effective treatments. A more consistent terminology would guide the formulation of future research directions.

Using current ICS-approved terminology, DHIC has been described as the concurrence of detrusor overactivity (DO) with detrusor underactivity (DU)[2]. However, as originally defined, the condition is the concurrence of "impaired contractility" as denoted by a voiding efficiency (VE: % bladder emptying during void) <50% in combination with "detrusor hyperreflexia" (now known as DO) [3]. Impaired contractility is a physiologic statement about detrusor strength, and is a "bladder-centric" construct. In contrast, voiding efficiency involves interactions between sensory, motor, brain, and biomechanical processes, and reflects overall homeostatic adequacy. As is DO, DU is a formally defined urodynamic observation, but says nothing about etiology. Therefore, we sought to determine if "DHIC" as defined by the combination of DU and DO is the same entity as originally defined, DO+VE<50%.

Study design, materials and methods

Age, sex, primary symptom, infused volume prior to void, post-void residual volume, Watts Factor, and primary urodynamic observation were abstracted from the electronic record of 256 consecutive videourodynamic studies conducted, attended and immediately interpreted by a single physician urodynamicist. Among these, 187 were from patients with a documented voiding attempt, free of diagnosed neurologic lesion, and no prior history of bladder surgery and thus suitable for this analysis. Urodynamic studies were conducted in the course of clinical practice, including patients referred from urology, geriatrics, neurology and urogynecology. Laborie Aquarius TT system was used, the patients generally in sitting position with a filling rate of 50 ml/min. Primary presenting symptoms were confirmed at the time of examination, and categorized as "UAB" (including voiding-related symptoms of hesitancy, intermittent or slow stream, and/or sensation of incomplete emptying), "OAB" (including frequency/urgency, and/or nocturia), and "UI" (including any involuntary loss of urine regarded as incontinence). Principal urodynamic findings were recorded as per ICS Terminology (2002). Obstructed patients were not included in Detrusor Overactivity (DO) or Detrusor Underactivity (DU) categorization. Voiding efficiencies were calculated. Records were grouped by DO, DU with and without DO, VE<50% with and without DO, no DU without DO, and VE>50% without DO. Kruskal-Wallis with Dunn's post-hoc test for multiple comparisons among groups and contingency tables were prepared. Primary symptoms for each group were compared graphically

Results

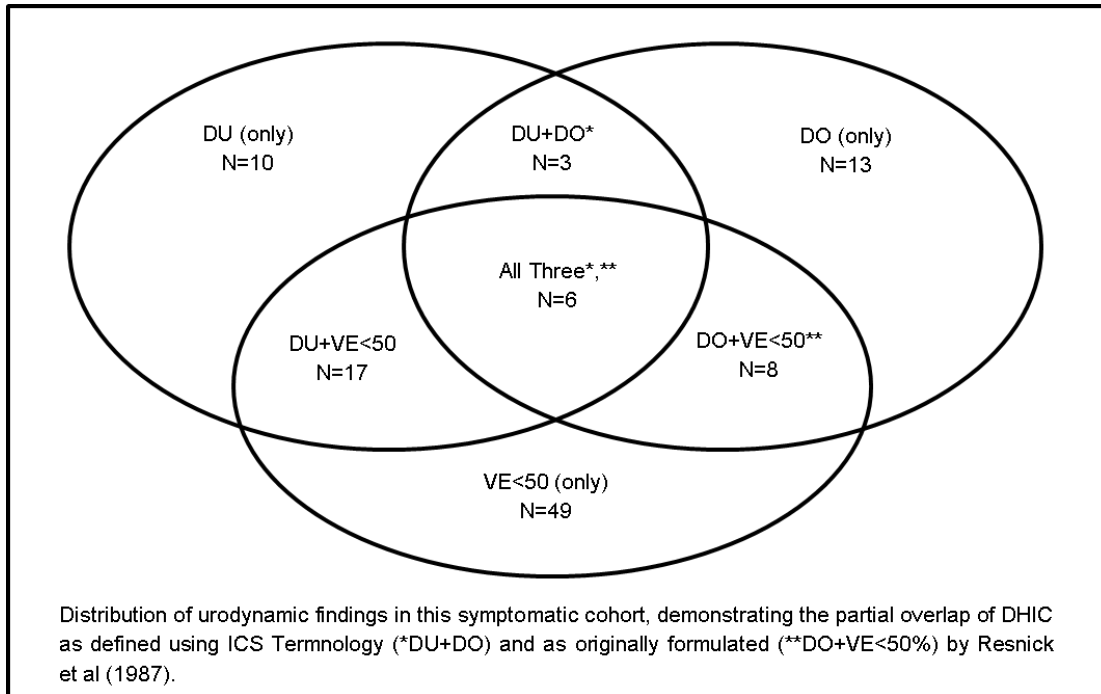
Unobstructed patients with abnormal voiding, defined both by DU or a VE<50% with or without DO were older than patients without objective non-obstructive voiding disorders (all comparisons; p<0.05). Patients with urodynamic DU had greater PVR and lower VE than patients without DU, and patients with VE<50% and those with VE<50%+DO had a greater PVR and lower VE than patients with VE>50% (in all cases, p<0.05). DHIC was diagnosed in 14 patients using VE<50%+DO, and 9 patients using DU+DO. Of 36 patients with urodynamic DU, 9 had also had DO of which 6 had VE<50%, and 17 had VE<50% without DO. 27 had urodynamic DU but normal filling. Of 80 patients with VE<50%, 14 also had DO, of which 6 also had urodynamic DU. Of 30 patients with DO, 9 also had only DU, of which 6 also had VE<50%. Eight had DO+VE<50% without DU. Detrusor underactivity is most associated with voiding symptoms or incontinence. Voiding symptoms are dominant with impaired contractility, whereas incontinence is the dominant symptom of detrusor overactivity. Mixed dysfunctions (DO plus DU and/or VE<50%) have similar presentations, with frequency/urgency being more common than voiding or incontinence symptoms.

Interpretation of results

The combination of DU and DO is similar, but not identical, to the original description of DHIC. VE<50%+DO classifies more patients as DHIC than does DU+DO. Patients with DU have greater per-void volumes and voiding efficiency than do those with VE<50%, however this is tautologic based on group definition. In particular, in the absence of DO, VE<50% may be more likely to be associated with voiding symptoms than DU. When combined with DO however, both DU and VE<50% are associated with similar symptom profiles. Patients with voiding impairment, whether defined by DU or VE<50% with or without DO are older than those with other urodynamic findings. The greater objectivity and sensitivity to combined filling/voiding disorders of detrusor performance suggest that the original definition is superior to a definition of DHIC based on currently accepted terminology. However, by containing the term "impaired contractility," DHIC contains potentially incorrect inferences

Concluding message

Our results point to the need for a formal definition of this disorder, based upon objective and clinically meaningful measures of detrusor performance. Standardization of diagnosis may be a critical first step towards an improved understanding of this common and clinically difficult problem.



References

1. 1. Resnick NA, Yalla SV, Laurino E, The pathophysiology of urinary incontinence among institutionalized elderly persons, NEJM 1989. 320: 1-7.
2. 2. Taylor JA and Kuchel GA, Detrusor Underactivity, Clinical Features and pathogenesis of an underdiagnosed geriatric condition, JAGS 2006. 54; 1920-1932.
3. 3. Resnick NA and Yalla SV, Detrusor hyperactivity with impaired contractile function. An unrecognized but common cause of incontinence in elderly patients, JAMA 1987. 257; 3076-81

Disclosures

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