

Redefining refractory Incontinence: Does ice water test (IWT) at one month after treatment correlate with the adequacy of suppression of neurogenic detrusor overactivity (NDO) in patients with neurogenic bladder after spinal cord injury.

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INTRODUCTION

'Refractory incontinence' is used in a clinical context, implying persistence of incontinence despite a given form of treatment. It is used as a symptom based definition. This subjective criteria is ill-suited in the objective evaluation of the neurogenic bladder of spinal cord injury (SCI), where storage pressure control and preservation of upper tracts is more important than mere control of leaks(1,2,3).

Mere symptomatic absence of leaks as seen in the presence of a spastic sphincter or detrusor sphincter dyssynergia may still be associated with higher storage pressures putting the upper tracts at risk(4,5).

When using oral anticholinergics for the control of NDO in the setting of neurogenic bladder, clinical titration with mere presence or absence of leaks may not be the best form of guidance to assess the efficacy of treatment.

We question this practice of monitoring the treatment of neurogenic bladder with NDO, based on symptom control alone and studied the role of Ice water test (IWT) after one month of treatment in determining the effectiveness of given anticholinergic treatment.

OBJECTIVES

We undertook this study in SCI patients in Indian scenario, who received high dose anticholinergic, tolterodine, at 8mg daily, to evaluate if the resultant symptomatic improvement can be taken as the indicator of adequate suppression of NDO and if such symptomatic improvement correlates with findings of IWT and UDS tests.

MATERIALS AND METHODS

We studied 50 male patients with suprasacral SCI, with the mean age of 38 years (range 22-53 years).

All patients had UDS documented NDO associated incontinence, despite being on tolterodine 4mg per day and were not satisfied with the given treatment.

They were given Double dose tolterodine (long acting), at the dose of 8 mg daily, for one month

Patients were Instructed to maintain regular bladder diary and record the number of incontinence episodes.

At one month of treatment, Ice water test (IWT) and UDS were repeated.

RESULTS

All patients tolerated the double dose tolterodine at 8 mg well with no significant side effects.

All patients were available for review after one month.

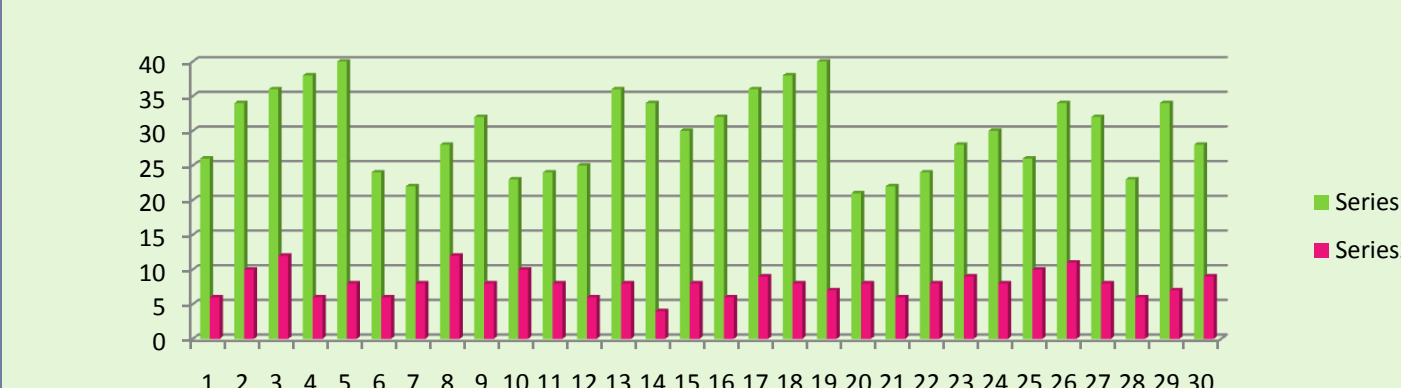
Based on the status of IWT test after one month of treatment results were reviewed in two groups as having either a persistently positive or a negative IWT after the treatment.

RESULTS continued

In our study, 60% of patients had a negative IWT after one month of treatment. These patients showed greater reduction in the number of leaks from 30(range 21-40) at baseline to 8 per week (range 4-12) after the treatment.

Series 1 :Before the treatment

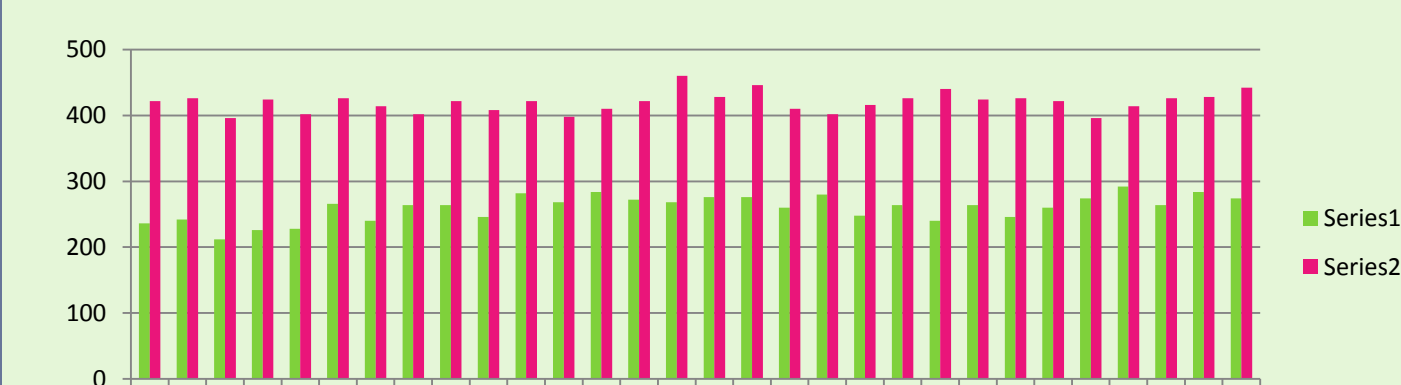
Series 2: After the treatment



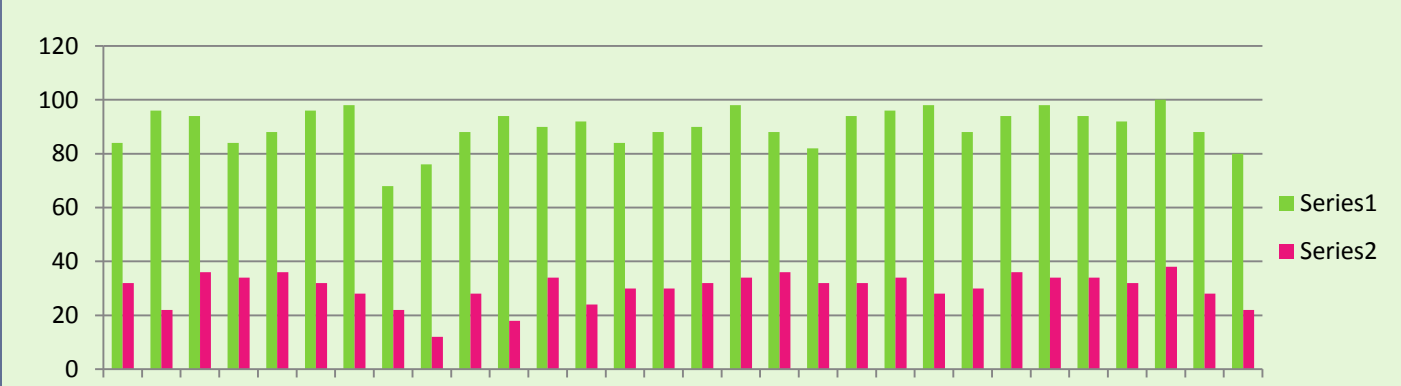
They also showed greater improvements in the volume at first contraction to post treatment 240 ml (range 196-264ml) from the pretreatment levels of 80ml (range 58-96ml).



Cystometric capacity in this group increased to post treatment levels of 420ml (range 398-446ml) from pretreatment values of 260 ml (range 212-284ml).



They also showed greater reduction in the maximum pressure of NDO to 30cm (range 12-36cm) from pretreatment mean value of 90 cm (range 68-98cm).



However 40 % of patients still had a positive IWT at one month of treatment. Patients in this group had lesser reduction in the number of leaks from 30 per week (range 21-40) to 14 leaks per week after one month of treatment (range 8-20).

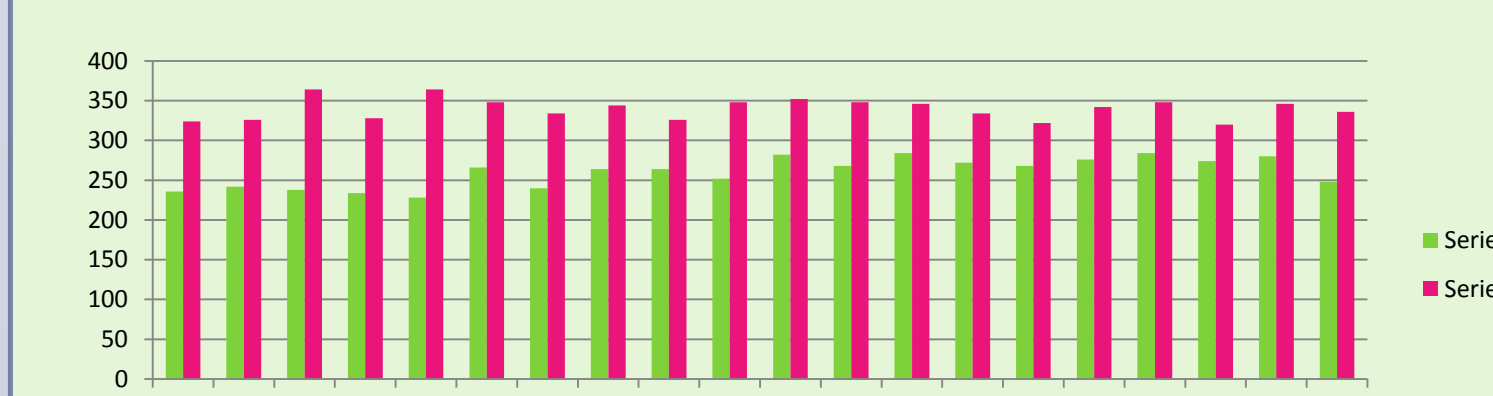


Patients with Positive IWT also showed less marked improvement in volume at first contraction, rising to 140 ml(range 122-152ml) from pretreatment mean value of 80ml(range60-94 ml).



RESULTS continued

Cystometric capacity though increased to 340ml (range 324-364) from pretreatment levels of 260 ml (range 228-284ml), yet it was less pronounced compared to the IWT negative group.



Patients with persistently positive IWT after the treatment showed the persistence of higher pressure detrusor overactivity after the treatment, at a mean of 70cm (range 50-78cm) from the pretreatment values of 90 cm(range 68-98cm of water).



DISCUSSION

Anticholinergics form the first line of management of NDO(1). These are safe, efficient and well tolerated (7,8,9). Recommended dosage don't always lead to desired outcomes. Up to 30 % of patients have persistent detrusor overactivity despite taking the anticholinergics at the standard doses (2,7).

Greater improvement is noted using higher than recommended doses (2,6,7) or the combination of anticholinergics(3). Most patients tolerate such treatment well and observe significant improvement.(2, 3).

Ethans(6) noted improved clinical response as enhanced bladder capacity and reduced incontinence rates with progressively increasing the dose from 2mg tolterodine to 4mg per day and further more to 8 mg per day.

Van kerrebroeck(7) recorded improved urodynamic as well as satisfactory clinical response at higher doses. Madersbacher (2) noted similar improved response with higher dose of tropsium of 135 mg per day.

However, such subjective improvement is not always reproducible at UDS in terms of significant reduction of NDO and storage pressures.

In our study, 60% of patients were found to have the IWT, which was positive pretreatment, turn negative after one month of treatment with tolterodine 8mg.

This group of patients showed greater reduction of incontinence than those who still had IWT positive after the treatment. Patients with IWT turned negative after treatment showed better improvement in reflex volume and the Cystometric capacity compared to those who still showed positive IWT. The reduction of maximum pressure of NDO was seen to be more pronounced in patients with negative IWT compared to those with positive IWT.

Thus we observed significant correlation of post-treatment IWT turn negative with the degree of subjective improvement as well as improvement of the urodynamic parameters in our group of patients. Ever since its description in 1957 by Bors, IWT has been used to indicate neurogenic etiology of vesical dysfunction (5). Initially used as a bedside clinical tool, lately IWT has come to be done along with the UDS, further increasing its predictive value.

Steanu(4) noted a positive response rate of 95.5% of IWT in patients with neurogenic bladder, with 10% more detection rate with IWT than seen on UDS alone. This was used in the diagnostic setting of early evaluation of NGB.

We have used IWT in a new role as a screening or monitoring tool, in the follow up phase of patients on anticholinergics to assess the adequacy of response to treatment.

We interpret a positive IWT in this scenario to be an indicator of insufficient suppression of neurogenic detrusor overactivity as seen in up to 40 % of our patients on treatment with tolterodine, 8mg.

Madersbacher (2) and Horstmann (3) also observed insufficient response in 30-40% of patients with anticholinergics with UDS proven persistent neurogenic overactivity.

In the setting of post-treatment monitoring of NDO, a persistently positive IWT may be taken to indicate the persistence of or incomplete suppression of the neurogenic detrusor overactivity despite the ongoing treatment.

It also indicates the need to monitor such patients more closely. Such patients are at greater risk of being overlooked as the ongoing treatment may cause a false sense of safety. These patients are likely to have repeated infections and greater risk of renal function impairment due to persistently high storage pressures.

A persistently positive IWT is also a good indication to proceed with detailed UDS.

Advantage of IWT is its ease of performance, even by the bedside in a conventional manner. It is a low cost, rapidly performed test and can be a useful option in developing countries, where UDS may not be so freely available.

CONCLUSIONS

Mere symptomatic control of incontinence is not a sufficient indicator of the efficacy of anticholinergics.

IWT positivity at one month after the treatment may be used as a marker to evaluate the effectiveness of a given treatment.

Persistently positive IWT despite the treatment indicates persistence of or incomplete suppression of neurogenic detrusor overactivity and mandates the need to pursue detailed UDS.

'Unsafe' storage demonstrated at UDS must lead to early consideration of alternate forms of treatment such as intravesical botulinum toxin and sacral nerve stimulation.

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