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NOCTURNAL ENURESIS IN PAEDIATRIC PATIENTS: EXPLORING THE ROLE OF THE OVERACTIVE BLADDER AND OF ANTIMUSCARINIC TREATMENT. A SINGLE CENTRE EXPERIENCE.

Hypothesis / aims of study

Overactive bladder and reduced functional bladder capacity have been identified as one of the causes of nocturnal enuresis in children. However, its prevalence amongst enuretic children has little been studied and published data on the use of antimuscarinics for treating nocturnal enuresis are sparse, with most of the literature examining the nocturnal polyuria factor of enuresis.

In a patient cohort of a Functional urology outpatient clinic of a single centre we aimed to investigate retrospectively the characteristics of nocturnal enuresis among paediatric patients seeking treatment, with a focus on the overactive bladder and treatment effect of antimuscarinics.

Study design, materials and methods

We retrospectively reviewed notes of a paediatric patient population who visited outpatients with a primary complaint of nocturnal enuresis. As per protocol, children were evaluated with history, clinical examination, uroflow and post-void residual measurement, bladder and kidney ultrasound, biochemistry, and a 3-day bladder diary recording number and time of micturitions, voided volumes per micturition, fluid consumption, nocturnal pad/diaper weight and daily incontinence episodes if present. All patients were offered the option for conservative (behavioural) treatment in case they were treatment-naive upon presentation, with nocturnal fluid restriction two hours prior to sleep, bladder training and nocturnal wakening programme. Children receiving desmopressin were re-evaluated by biochemistry at 7 (seven) days and 1 (one) month before continuing with their treatment, while all children were re-evaluated at outpatients at three months.

For the purposes of the study, data were analyzed for primary versus secondary enuresis, monosymptomatic enuresis versus overactive bladder symptoms together with enuresis and for the recommended first line treatment and its efficacy. Bladder diary (if available) and uroflow parameters were compared prior and after treatment with antimuscarinics.

Results

We retrospectively analyzed data from 100 consecutive patients with a mean age of 8.8 (SD: 2.6) years. Fifty seven boys (57%) and 43 (43%) girls were included in the analysis. Fifty seven patients were treatment naive (57%) while 23% had a prior history of desmopressin treatment. Primary nocturnal enuresis was recorded in 71% while secondary in 29% of them. Monosymptomatic nocturnal enuresis was reported in only 22% of patients. By contrast, concomitant overactive bladder symptoms daily urinary symptoms was reported in 88% of them and confirmed by bladder diary findings in 61%. Daily incontinence (OAB-wet syndrome) was reported in 40% and confirmed based on bladder diary in 36% of the patient cohort.

First line treatment with antimuscarinics was recorded in 72%, desmopresin in 10%, while behavioural treatment in 18%. Oxybutinin was the antimuscarinic of choice in 91% of cases. At the 3-month follow up, nocturnal enuresis was cured in 25% while significantly improved in another 65% of those patients receiving antimuscarinics. No improvement under antimuscarinics was noticed in 8% while worsening of symptoms was reported by 2%. Based on bladder diary data, a significant (45.48%, $p<0.0001$) overall reduction of the mean number of episodes of enuresis per week was found after treatment. For those who were treatment naive upon presentation, mean reduction after treatment with antimuscarinics was 58.32% ($p<0.0001$) while after desmopressin treatment 51.7% ($p=0.008$). No statistical significant improvement was noticed, however, in patients who only followed behavioural treatment. Crossover from desmopressin to antimuscarinics resulted in a 50.93% ($p=0.006$) reduction of the mean episodes of enuresis per week while crossover from desmopressin to behavioural treatment in only 19% reduction ($p=0.38$). Mean voided volume at uroflow increased, although not statistically significantly, by a mean 23.4% after treatment with antimuscarinics (159.53 mls prior vs 196.89 mls post, $p=0.137$). No significant changes were also seen in maximum flow rate (19.98 ml/sec prior versus 23.02 ml/sec post, $p=0.217$) and post-void residual (12.6 ml prior vs 13.10 ml post, $p= 0.9$).

Interpretation of results

Enuresis as part of the overactive bladder syndrome seems to be a common observation during initial evaluation of children with enuresis. First line treatment with antimuscarinics improved the vast majority of those young patients and should be considered in all children with non-monosymptomatic enuresis. As a consequence, antimuscarinics work effectively as salvage therapy in desmopressin failures in these cases. Desmopressin should be preserved for those patients with confirmed nocturnal polyuria without OAB symptoms during bladder diary.

Concluding message

Children with nocturnal enuresis should be evaluated and screened for the presence of OAB before treatment initiation. The bladder diary should be the main tool in children's evaluation for decision making as reduced bladder capacity may be common in this paediatric population. Antimuscarinics can be offered as first line treatment whenever there are symptoms suggestive of OAB and confirmed based on bladder diary. Desmopressin, which is currently widely used, should to be offered with caution and after proper evaluation with a bladder diary as monosymptomatic enuresis seems to be present in a minority of enuretic children.

Disclosures

Funding: None **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** Retrospective study about the managment of patients with nocturnal enuresis in a single institute.Initial evaluation and medical treatment was based on EAU guidelines and no

experimental treatment modalities were used. **Helsinki not Req'd:** Daytime clinical practise in an outpatient clinic , always based on EAU guidelines does not require Declaration of Helsinki, especially when established and evidence based medicine is provided. Retrospective analysis of patients outcome during follow up and presentation of the results is not contraindicated to the Declaration of Helsinki **Informed Consent:** No