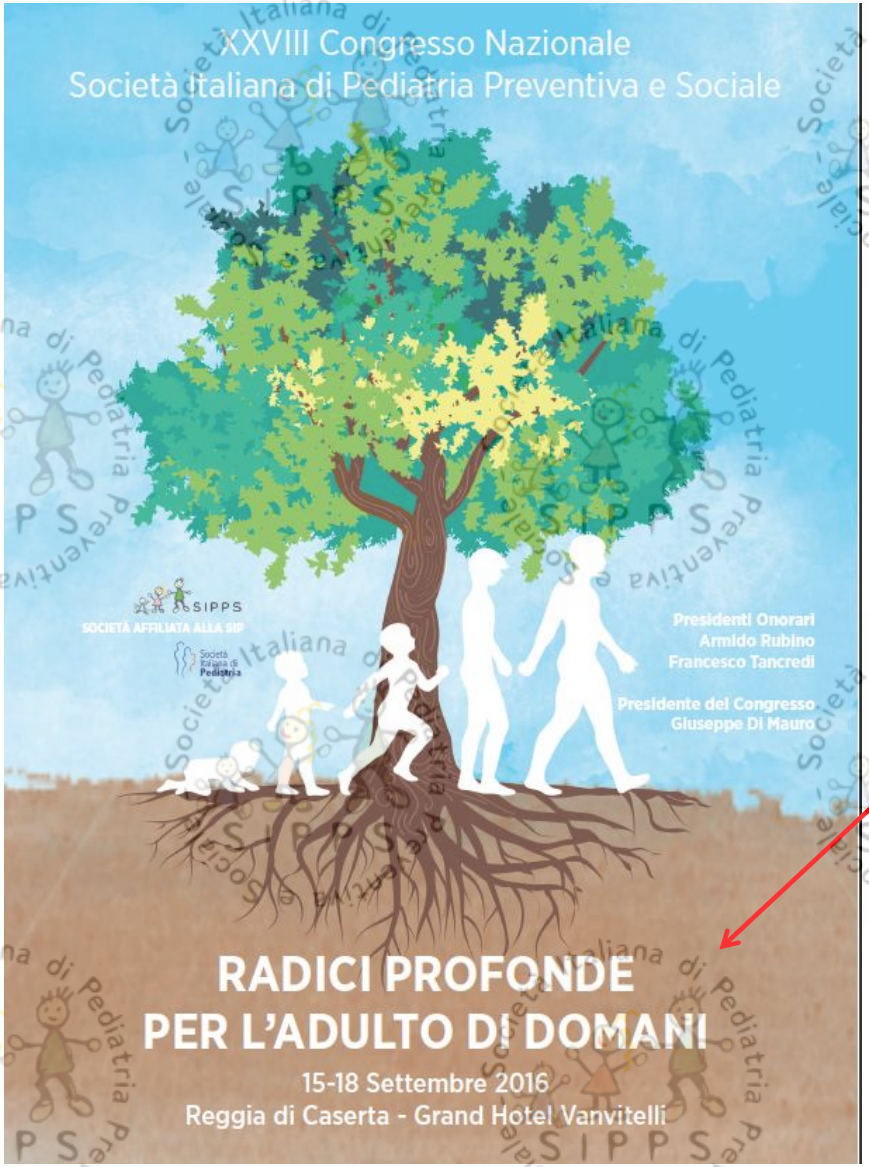

La Gestione dell'Enuresi

Roberto Del Gado
Paolo Montaldo

Maria, Giovanni e il pediatra

Buongiorno Professore, lei non si ricorda di me.

Io sono una “vecchia paziente”, ho 36 anni e quando ne avevo sette lei mi vide perché bagnavo il letto di notte (quando mia madre la chiamò, un po’ ignorantella, le disse che soffrivo di “uresine attorno”).

Maria, Giovanni e il pediatra

Mi prescrisse il Tofranil per un mese: il problema si risolse... anche se lei aveva PARLATO DEI POSSIBILI EFFETTI COLLATERALI DEL FARMACO...ora ho il mio bambino Giovanni di sei anni che ha lo stesso problema

Anamnesi familiare

Giovanni

- Genitori (Nicturia) *Enuresi e nicturia mamma*
- Fratelli *Nessun fratello enuretico*
- Urolitiasi *Nessuna familiarità per calcoli*

DATI DI FATTO

- 80% figli enuretici (ENUR 1-2-3)
- 10% circa
- *Urolitiasi (Ipercalciuria)*

Scandinavian Journal of Urology and Nephrology, 2010; 44: 101–105

ORIGINAL ARTICLE

Correlations between enuresis in children and nocturia in mothers

PAOLO MONTALDO, LUCIA TAFURO, VALERIA NARCISO, ANDREA APICELLA, LUIGIA RITA IERVOLINO & ROBERTO DEL GADO

Department of Pediatrics, Second University of Naples, Naples, Italy

Abstract

Objective. To demonstrate a relationship between enuresis and nocturia. *Material and methods.* The study investigated 250 mothers (average age 34.6 ± 3.3 years) whose children attended the Department of Pediatrics of the Second University of Naples because they suffered from enuresis. Data were collected by self-reported questionnaire and personal interview. All women provided written informed consent with guarantees of confidentiality. Both the presence of nocturia in adulthood and enuresis in childhood were taken into account. *Results.* The overall prevalence of nocturia was 38% ($n = 95$). There was a history of childhood bedwetting in eight mothers (5%) without nocturia and in 61 mothers (65%) with nocturia; the difference was significant (χ^2 $p < 0.01$). Moreover, among the 110 enuretic children of nocturic mothers, 69 (62%) suffered from non-monosymptomatic nocturnal enuresis (NMNE), and 34 (56%) of their mothers suffered from NMNE in childhood. Nocturic mothers suffering from non-monosymptomatic enuresis during their childhood had offspring with a higher risk of developing non-monosymptomatic enuresis (odds ratio 4.3 95%, confidence interval 2.6–7.1, $p < 0.01$). *Conclusions.* These findings enabled a close connection between nocturia in adulthood and enuresis in childhood to be hypothesized. Furthermore, this analysis provided evidence of the link between suffering from nocturia, and previously from enuresis, and having children affected by enuresis.

Key Words: *Enuresis, family linkage, nocturia*

Introduction

Enuresis is one of the most common childhood problems and represents an important chapter because of its physiopathological implications in adulthood and its social impact. Primary nocturnal enuresis (PNE) is a common condition that affects around 6–10% of 7-year-olds [1] and, for a small percentage of children, it persists into adolescence [2]. The impact of this condition upon the patient is significant and includes low self-esteem, family conflicts, embarrassment and reduced performance at school. Classical linkage studies have been carried out on a highly select subgroup of multigenerational families. Four loci associated with nocturnal enuresis have been identified on chromosomes 8, 13, 22 and 12 [3, 4]. PNE is a heterogeneous condition for which various causative factors have been hypothesized.

The International Continence Society defines nocturia as "waking at night to void". The definition covers any number of voids, providing that the person awakens before voiding [5]. It is difficult to estimate precisely the prevalence of nocturia, because epidemiological studies have different definitions of the condition. In a national survey conducted by telephone, in 5204 community-based adults, 31% reported at least one void per night and 14.2% reported at least two voids per night [6]. Nocturia and enuresis share important common pathophysiological factors. It is now agreed that nocturnal polyuria, detrusor overactivity and low bladder capacity are, in various combinations, central to their pathogenesis.

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Anamnesi fisiologica

Giovanni

●Eco in gravidanza	*Normali*
●Notizie parto	*A termine eutocico*
●Allattamento	*Materno esclusivo per 6 mesi*

DATI DI FATTO

- Ev malformazioni
- Prematuro più frequente
- No correlazione con il tipo di allattamento

Anamnesi minzionale

Giovanni	
● Acquisizione continenza urinaria diurna ?	*Dopo 4aa e mezzo*
● Acquisizione continenza urinaria notturna?	*No*
● Quante notti bagna?	*Tutte le notti(da sempre)*
● Bagna le mutandine di giorno?	*No*
● Minzioni al giorno?	*5-7*

DATI DI FATTO

- Primaria
- Secondaria (eventi stressanti)
- Mono
- Non mono
- Terminologia

Esame obiettivo

- Peso,altezza
- Completo
- PA
- Tonsille ,adenoidi OSAS
- Ev malformazioni(piedi...) spina bifida occulta
- Es urine segni indiretti IVU
- …..eco

CONCLUSIONI

Giovanni ha un’enuresi notturna primaria monosintomatica, ma…… ci sono Antonio,

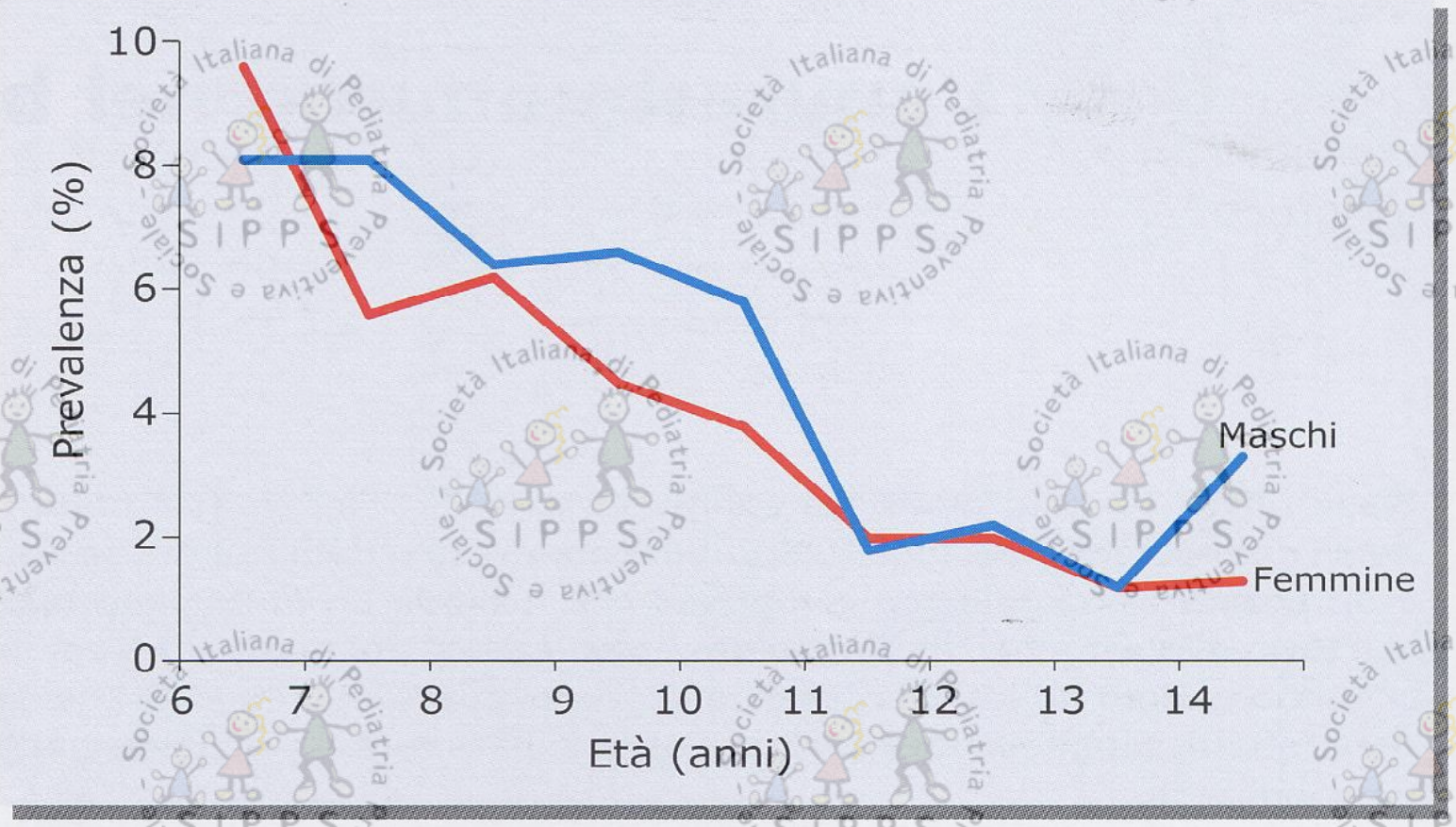
Luigi, Annamaria…. che hanno un’enuresi notturna primaria non-monosintomatica.

Ci sono ancora Luigi, Francesco che hanno un’enuresi notturna secondaria che può essere mono o non- mono

ENURESI	Incontinenza urinaria intermittente (perdita di urina in episodi separati tra loro) durante il sonno
ENURESI MONOSINTOMATICA	enuresi in un bambino che bagna il letto una sola volta per notte e non presenta nessun altro sintomo di disfunzione vescicale
ENURESI NON-MONOSINTOMATICA	enuresi in un bambino che bagna il letto più di una volta per notte e presenta anche sintomi di disfunzione vescicale come)aumentata frequenza minzionale*)diminuita frequenza minzionale*)urgenza*)incontinenza da urgenza*)getto esitante*)getto filiforme*)getto forzato*)getto interrotto*)manovre di sostengo del piano perineale*)gocciolio post-minzionale*
ENURESI PRIMARIA	enuresi in un bambino che non è mai stato asciutto per almeno 6 mesi
ENURESI SECONDARIA	enuresi in un bambino che è stato precedentemente asciutto per almeno 6 mesi

***AUMENTATA FREQUENZA MINZIONALE**	**≥ 8 minzioni/die**
***DIMINUITA FREQUENZA MINZIONALE**	≤ 3 minzioni/die
***URGENZA**	Improvviso, impellente e improcrastinabile stimolo a mingere
***INCONTINENZA DA URGENZA**	incontinenza in quei pazienti che avvertono urgenza. Può manifestarsi solo con mutandine bagnate oppure con perdite di urina oggettivabili
***MANOVRE SOSTEGNO PIANO PERINEALE**	manovre attivate per rimandare la minzione o contrastare l'urgenza (saltelli sulla punta dei piedi, incrocio forzato delle gambe, accovacciamento spesso con il calcagno premuto sul perineo)
***GETTO ESITANTE**	difficoltà nell'iniziare la minzione o lunga attesa prima di iniziare la minzione.
***GETTO FILIFORME**	mitto emesso con poca forza
***GETTO FORZATO**	minzione iniziata o mantenuta utilizzando il torchio addominale

Figura 1. Prevalenza dell'enuresi nella popolazione pediatrica tra 6 e 14 anni. (Elaborata su dati di Chiozza et al[8]).



ALCUNI DATI DI FATTO

- 9.4% (6 aa) → 2.3% (11 aa); M/F ~ 2
- Seconda solo all'allergia
- Guarigione spontanea = 14-15%/anno…
- Adolescenti enuretici = 0.8-3%
- Adulti enuretici = 0.5%
- Bambini infelici = 35%
- Bambini molto infelici = 25%

ADOLESCENTI ED ENURESI

- 1-2% degli adolescenti (14-18 aa)
- Problemi psicologici : amplificati
- Ambivalenza dell'atteggiamento genitoriale

ADULTI ED ENURESI

- Dati epidemiologici variabili : 0.5-3.8%

  Hirasing; Acta Pediatr,1997

- Imbarazzante e fastidiosa

  Cushing e Baller, 1975

- Enuresi ad insorgenza in età adulta

INCONTINENZA

CONTINUA

- Malformazioni congenite
(Spina bifida, uretere ectopico, etc.)
- Danno iatrogeno sfintere uretrale

INTERMITTENTE

INCONTINENZA DIURNA

ENURESI

Patogenesi

- Monosintomatica
- Poliuria
- Profilo adh notturno
- ...e la vescica?

- Non monosintomatica
- Iperattività vescicale(ns lavoro)
- Eco
- ……e la poliuria?

- LOCUS COERULEUS

MISMATCH

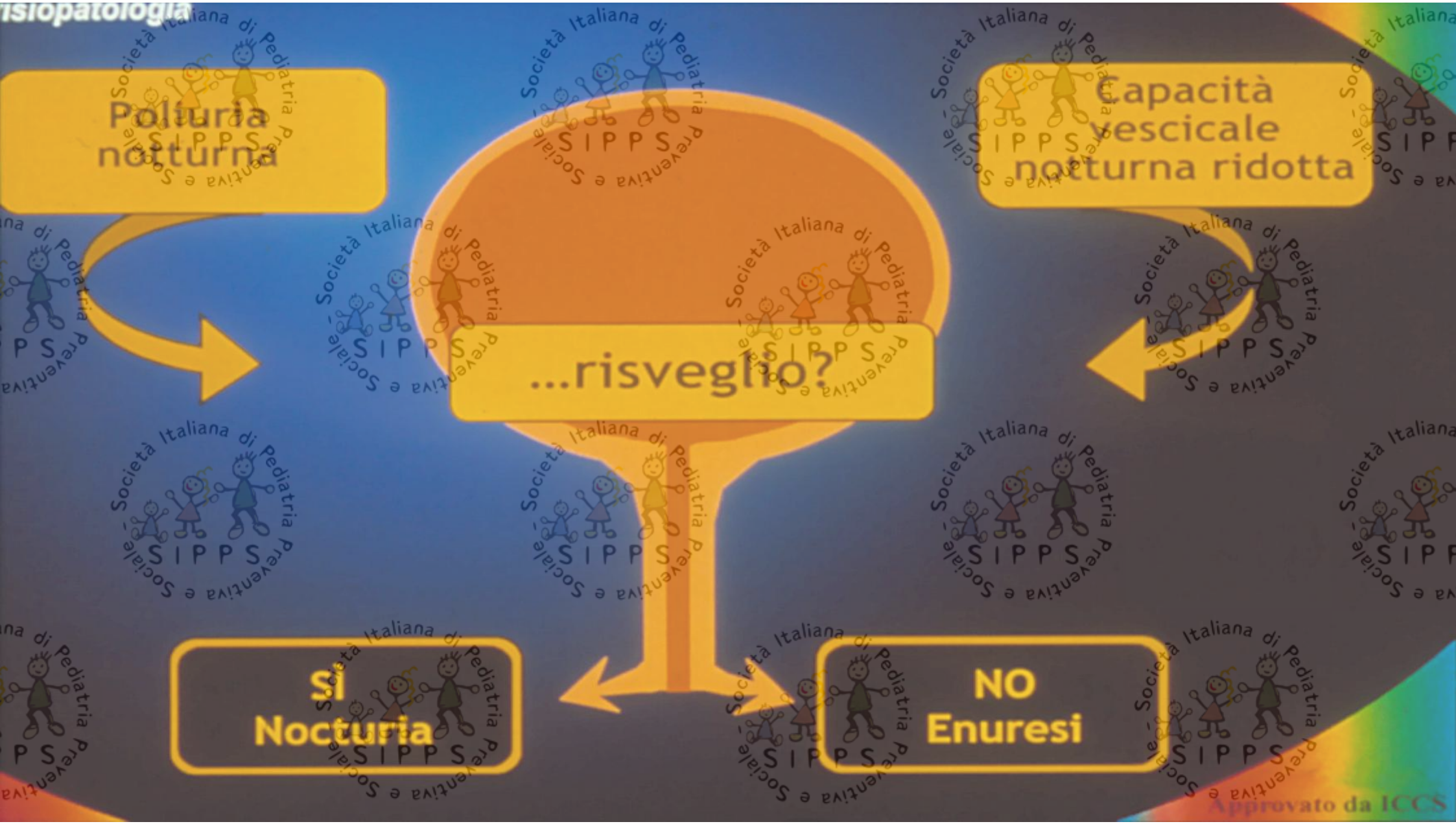
↓ CAPACITA'VESCICALE NOTTURNA

↑ PRODUZIONE NOTTURNA DI URINE

+

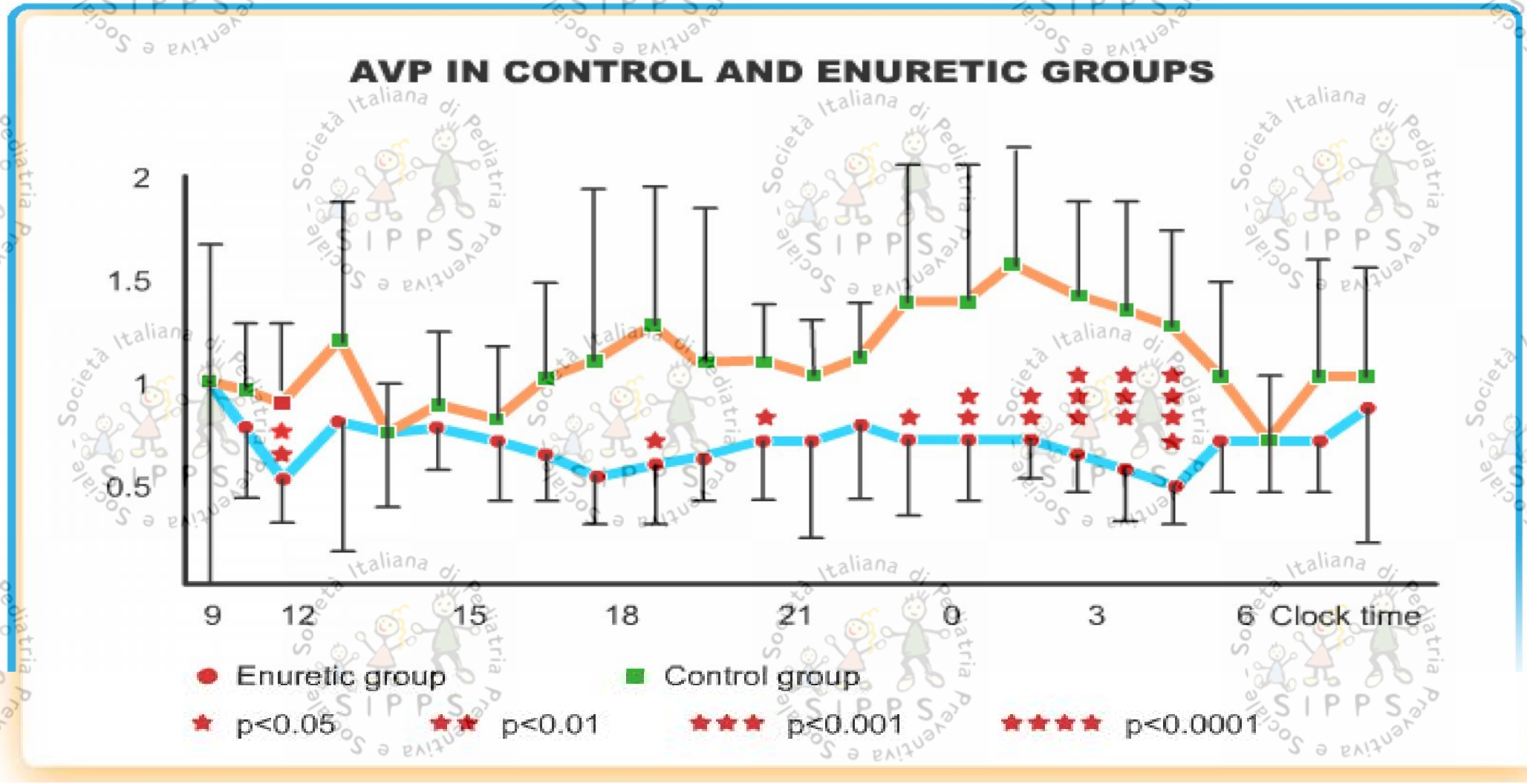
SONNO PROFONDO E INCAPACITA' DI RISVEGLIO

ESISTONO VARIE COMBINAZIONI DI QUESTI TRE ELEMENTI


Poliuria notturna
Capacità vescicale notturna ridotta
...risveglio?
Sì Nocturia
NO Enuresi
Approvato da ICCS

FISIOPATOLOGIA

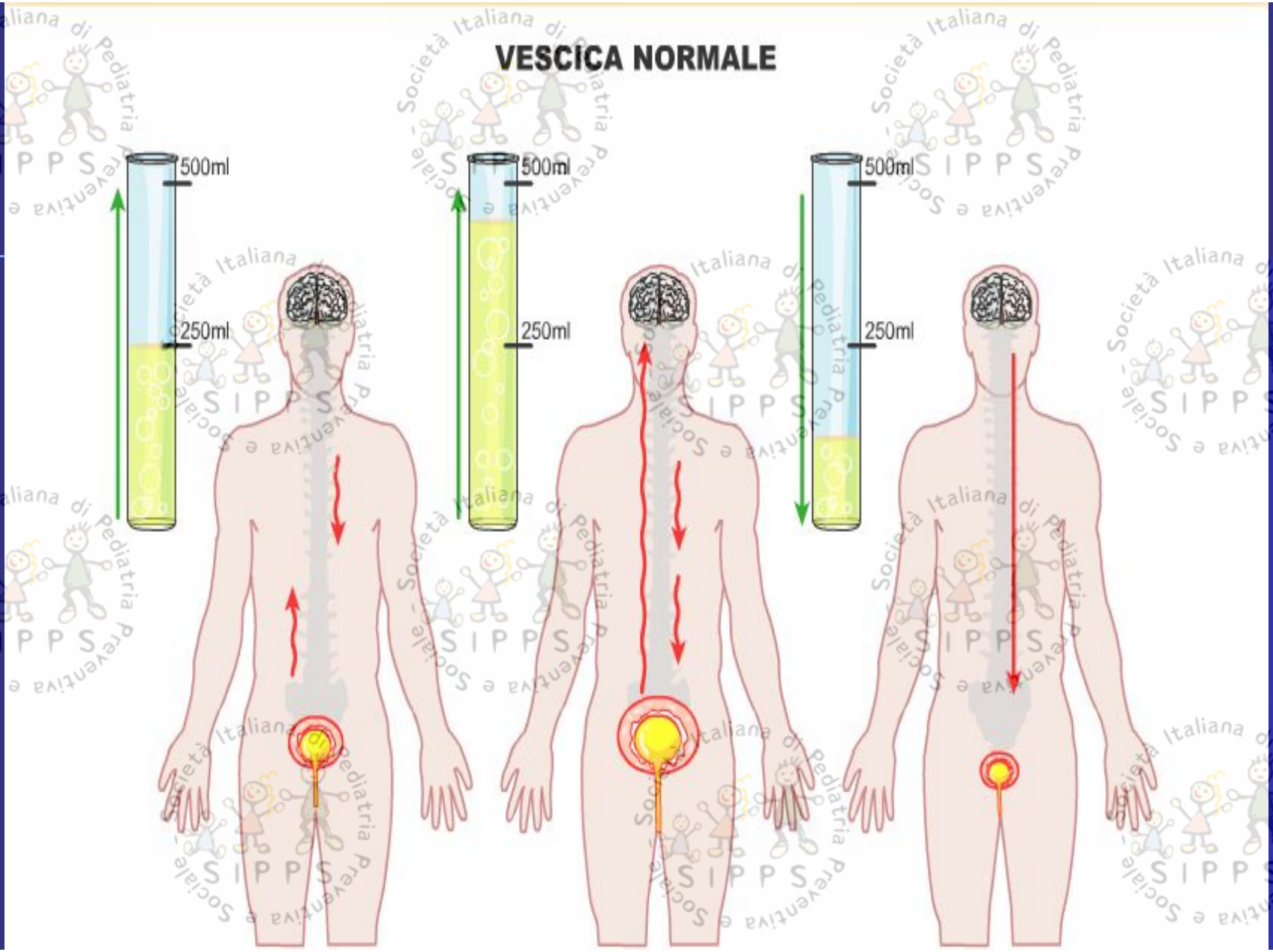
1. **Poliuria notturna**
2. **Iperattività detrusoriale**
3. **Disturbi del sonno**
4. **Ereditarietà**


AVP IN CONTROL AND ENURETIC GROUPS
2
1.5
1
0.5
9
12
15
18
21
0
3
6
Clock time
Enuretic group
Control group
p<0.05
p<0.01
p<0.001
p<0.0001

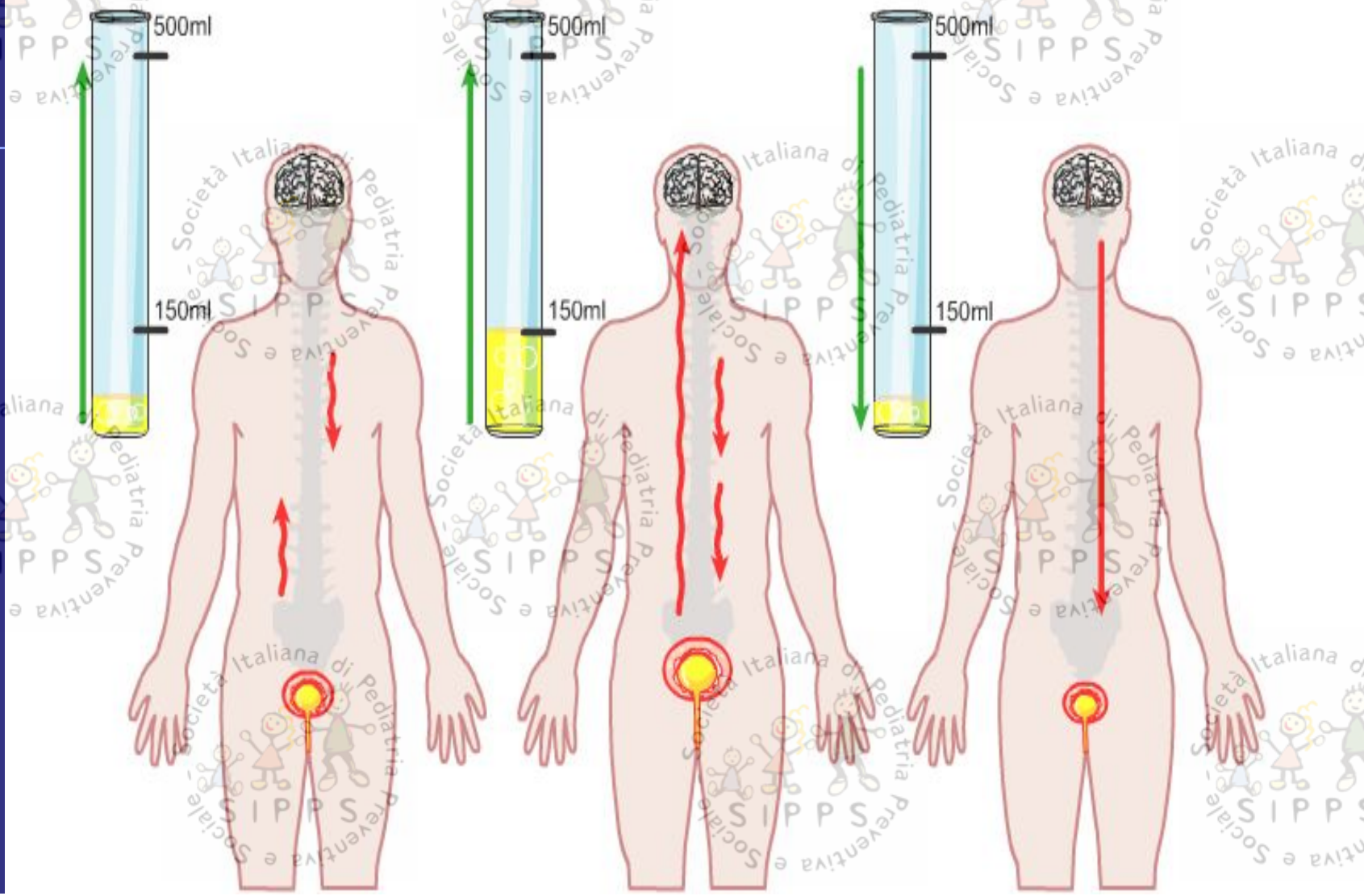
FISIOPATOLOGIA

1. Poliuria notturna
2. Iperattività detrusoriale
3. Disturbi del sonno
4. Ereditarietà

VESCICA NORMALE



VESCICA IPERATTIVA



DANZA DELLA PIPÌ

Mitto interciso

Accovacciamento

Saltelli su un piede "danza"

MASSIMO VOLUME VUOTATO (c.v.)
(età + 1) x 30 ml

Età: 7 anni — CV attesa 240ml

Orario	Volume (ml)	Urgenza	Mutandine bagnate
6.30	80 ml	no	no
9.35	70 ml	si	un po'
14.00	75 ml	si	no
16.00	70 ml	si	si
19.20	60 ml	no	no
22.45	70 ml	no	no
notte	peso panno= 450 g		
	tara panno= 50 g		

Formula valida fino a 12 anni

> 12 anni il V.V. atteso è stimato intorno ai 390 ml

V.V. ridotto se < 70% di quella atteso

BJUI
BJU INTERNATIONAL

Ultrasonographic bladder measurements can replace urodynamic study for the diagnosis of non-monosymptomatic nocturnal enuresis

Lucia Tafuro, Paolo Montaldo, Luigia Rita Iervolino, Fabrizio Cioce* and Roberto Del Gado

Study Type – Diagnostic (exploratory cohort)
Level of Evidence – 2b

OBJECTIVE

To compare urodynamic (UD) and ultrasonography (US)-based measurements for the diagnosis and follow-up of patients with non-monosymptomatic primary nocturnal enuresis (NMPNE).

PATIENTS AND METHODS

The study included 455 enuretic children (282 boys and 173 girls, mean age 9.58 years) with daytime voiding symptoms and with more than one void per night. In healthy children the upper limits for US-measured bladder wall thickness are 3 and 5 mm for a full or empty bladder, respectively. In 419 children the results showed urodynamic signs of an overactive bladder (OAB) and the US-measured bladder wall was thickened. After 6 months of antimuscarinic treatment, we re-assessed the children with US and UD; the relation between UD and US measurements was confirmed. After analysing these data, we considered the use of a new diagnostic assessment for patients with NMPNE. In children with a significant US measurement, i.e. a bladder wall with a thickness of >3 mm (full bladder) and >5 mm (empty bladder), the diagnostic assessment was concluded and therapy was started. We restricted the UD examination exclusively to those patients who either had severe intractable symptoms or did not respond to treatment. This new management was applied to 453 patients with NMPNE. After the first 6 months of therapy all the patients were assessed with a new US study.

RESULTS

In all, 343 patients (75.7%) were full-responders, with a normal bladder wall thickness; 82 (18.1%) were partial responders but with no normalization of bladder wall thickness; only 28 (6.2%) were classified as nonresponders with a persistent thickened bladder wall.

CONCLUSIONS

We favour a more conservative management: the UD study should be limited to the very few patients who either have severe intractable symptoms or do not respond to treatment. In our experience, the US study, which is not invasive, is useful for the diagnosis and follow-up of NMPNE and it is preferable to the UD study, which is invasive and often traumatic for children.

KEYWORDS

enuresis, voiding dysfunctions, ultrasound, urodynamic

" Recentemente è stato dimostrato che una eventuale ipercalciuria assorbitiva durante le ore notturne ostacola l'azione di farmaci come la desmopressina "

ENURESI: DISTURBI DEL SONNO

Incapacità di svegliarsi
in tempo
per controllare la minzione


RAPPORTI TRA APNEE NOTTURNE ED ENURESI
OSA*
*Apnea notturna ostruttiva
**ANP = ***FeNa$_u^+$
** fattore natriuretico atriale
*** frazione di escrezione Na^+_u

FISIOPATOLOGIA

1. Poliuria notturna
2. Iperattività detrusoriale
3. Disturbi del sonno
4. **Ereditarietà**

EVENTI STRESSANTI

- nascita fratellino/sorellina
- cambiamento di casa
- cambiamento di scuola
- problemi scolastici
- abuso (sessuale/fisico)
- problemi familiari (divorzio/lutto)
- eventi speciali (compleanno)
- incidente/lesione
- altro

QUANDO E PERCHE' TRATTARE?

- DALL'ETA' DI 5 ANNI E MEZZO
- IN PRESENZA DI NOTEVOLE RIDUZIONE DELL'AUTOSTIMA
- QUANDO CIO' RAPPRESENTA UNA LIMITAZIONE SOCIALE PER IL BAMBINO

CARE!

PER IL 65% DEGLI ENURETICI ...

...NO CARE!

PEDIATRA DI FAMIGLIA

- 6 % enuretici(5-14 aa)
- 25-30% enuretici(MPNE)
- Anamnesi veloce(familiarità, abitudini minzionali)
- Consigli generali di care

CONSIGLI UTILI alla sera

1. Per la cena limitare l'introduzione di cibi ricchi di calcio o troppo salati.

... PERCHÉ?

in questa maniera si produce meno urina durante la notte perché il rene secerne meno calcio e sodio nelle urine.

2. Per la cena scegliere tra le acque minerali quella con un contenuto di calcio inferiore a 25 mg/L

... PERCHÉ?

in questo modo limitiamo la produzione di urina durante la notte.

CONSIGLI UTILI alla sera

3. Svuotare sempre molto bene la vescica prima di coricarsi. La posizione migliore è quella seduto/a sul water con la faccia rivolta verso il muro (a rovescio).

4. Se i genitori vanno a letto più tardi ricordarsi di accompagnare in bagno il/la bambino/a anche se è molto assonnato.

... PERCHÉ?

questo modo di fare la pipì permette di svuotare completamente la vescica. Se la pipì alla sera non è fatta bene, a volte ne resta un po' in vescica e così viene tolto spazio all'urina prodotta durante la notte.

Scandinavian Journal of Urology and Nephrology, 2005; 39: 308–312

ORIGINAL ARTICLE

Desmopressin is a safe drug for the treatment of enuresis

ROBERTO DEL GADO, DONATELLA DEL GAIZO, MARINA CENNAMO, ROBERTA AURIEMMA, GABRIELLA DEL GADO & MARIATERESA VERNI

From the Department of Pediatrics, Second University of Naples, Naples, Italy

Abstract

Objective. To verify the safety of desmopressin treatment and its associated side-effects in a large number of patients. *Material and methods.* The study was conducted in accordance with the guidelines of the Italian Club for Nocturnal Enuresis, whose criteria are: age >5 years; absence of malformations and infections of the urinary tract; absence of psychological disorders or neurological alterations; number of "wet nights" >5–7; control of liquid intake during the afternoon and evening; monitoring of serum electrolytes before beginning treatment; control of body weight before the beginning of treatment and during the first 4–5 days of therapy; and the informed consent of the parents. The therapeutic regimen provided for a maximum dose of desmopressin of 40 μg/day (four puffs/nostril or two tablets), starting from an initial dosage of 20 μg/day (two puffs/nostril or one tablet) 1 h before going to bed. The study involved two groups of patients with monosymptomatic enuresis: some of them had been administered desmopressin in the form of a spray and others in the form of tablets. *Results.* A small percentage of patients presented mild, transient side-effects; in no case were severe side-effects verified. *Conclusion.* Desmopressin is a safe drug with a low incidence of side-effects.

Key Words: *Desmopressin, enuresis, side-effects*

Nocturnal enuresis is a disorder that affects almost 10–15% of children aged >5 years and almost 2% of young people aged 12–18 years [1,2]. Two types of enuresis have been defined: primary enuresis, in which nocturnal continence is never acquired, and secondary enuresis, in which children wet their bed again after at least 6 months of continence [3,4]. According to the diurnal and clinical framework, both primary and secondary enuresis are defined as "monosymptomatic" if enuresis is the only symptom and as "symptomatic" if there is both nocturnal enuresis and day-time incontinence. Enuresis is defined as a transitory disorder, as most children acquire control of their sphincters by the age of 5–6 years [5]. However, the disorder persists beyond the age of 6 years in a significant proportion of subjects (≈10%) before decreasing in prevalence (2%) during the adolescent period, during which each subject should attain personal stability corresponding to a feeling of personal identity. The conscious aspects of this feeling of personal identity are self-image and relationships with others. The persistence of enuresis in the teenager poses a strong risk of perception of the self-image and causes feelings of anger, shame and diversity from contemporaries; the teenager is dominated by a low level of self-esteem, by strong feelings of social inadequacy and anxiety and by sudden mood changes [6]. Also, the parents are often frustrated because of the limitations and ties imposed by their child's "illness"; this increases their anxiety, increasingly reducing the self-esteem of their child and leading to behavioral problems. These considerations underline the need for suitable treatments during childhood. Pharmacological therapy with desmopressin (DDAVP) assumes a fundamental role, while non-pharmacological therapy consists of a low intake of liquids during the evening and programmed urinations during the day [7]; behavioral therapy with a nocturnal alarm represents the final possibility. DDAVP has been widely prescribed and used for ≈20 years due to its therapeutic success.

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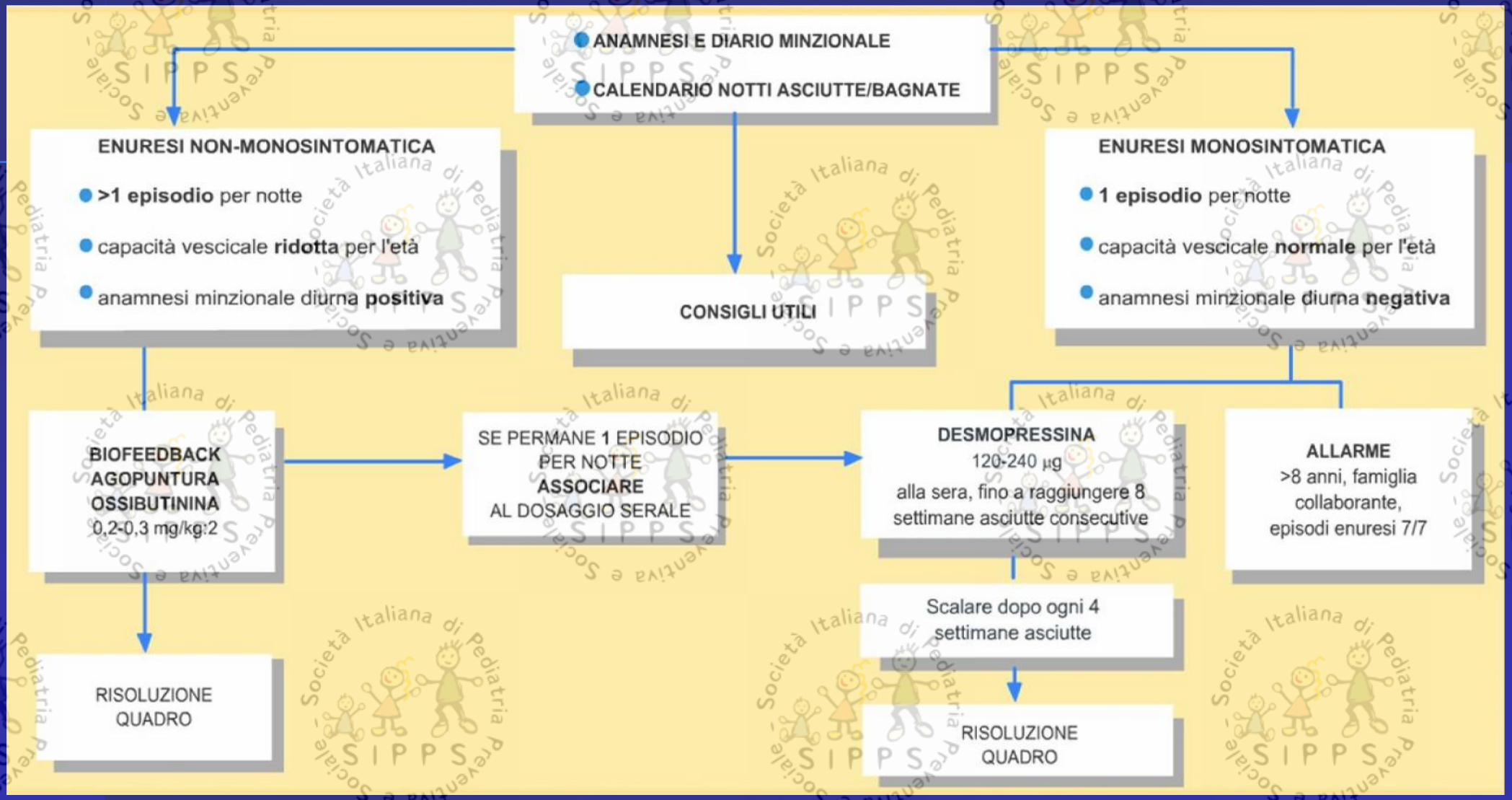
ANAMNESI E DIARIO MINZIONALE
CALENDARIO NOTTI ASCIUTTE/BAGNATE
ENURESI NON-MONOSINTOMATICA
>1 episodio per notte
capacità vescicale ridotta per l'età
anamnesi minzionale diurna positiva
CONSIGLI UTILI
ENURESI MONOSINTOMATICA
1 episodio per notte
capacità vescicale normale per l'età
anamnesi minzionale diurna negativa
BIOFEEDBACK
AGOPUNTURA
OSSIBUTININA
0,2-0,3 mg/kg:2
SE PERMANE 1 EPISODIO PER NOTTE
ASSOCIARE
AL DOSAGGIO SERALE
DESMOPRESSINA
120-240 µg
alla sera, fino a raggiungere 8 settimane asciutte consecutive
ALLARME
>8 anni, famiglia collaborante, episodi enuresi 7/7
RISOLUZIONE QUADRO
Scalare dopo ogni 4 settimane asciutte
RISOLUZIONE QUADRO

Consigli generali

- Care
- Bere
- Cena
- Supporti per asciutto(curiamo bambini,non lavatrici
- Stipsi.....

- Presa in carico
- Acque minerali
- Latte
- Solo ultima minzione
- Molta attenzione

- Terapia sartoriale
- Per la mono
- Per la non mono
- Scalare,mai stoppare

BJUI

Desmopressin and oxybutynin in monosymptomatic nocturnal enuresis: a randomized, double-blind, placebo-controlled trial and an assessment of predictive factors

Paolo Montaldo, Lucia Tafuro, Monica Rea, Valeria Narciso, Azzurra C. Iossa and Roberto Del Gado

Department of Pediatrics, Second University of Naples, Naples, Italy

Accepted for publication 7 October 2011

Study Type – Therapy (case series)
Level of Evidence 4

What's known on the subject? and What does the study add?
The desmopressin analogue to antidiuretic vasopressin is an evidence-based therapy but conflicting results are provided regarding the initial dose of oral desmopressin. Previous studies report the use of a combined therapy with desmopressin and oxybutynin to treat desmopressin-resistant monosymptomatic nocturnal enuresis. These studies show promising results, but they suffer from lack of randomization and lack of a placebo-controlled patient group and are of small sample size. In addition to this, no predictive factors of response to the combined therapy have been considered.

This study showed no significant difference between either a 120 µg or a 240 µg desmopressin initial dose with regard to degree of response. The study is the first randomized, double-blinded, placebo-controlled trial showing the efficacy of combination therapy with desmopressin plus oxybutynin for monosymptomatic nocturnal enuresis. Furthermore, bladder volume and wall thickness index, nocturnal polyuria and voiding latency were assessed as predictive factors of response to the therapy.

OBJECTIVES

- To assess the efficacy of desmopressin plus oxybutynin and compare two starting dosages of desmopressin (120 and 240 µg) in a randomized, double-blinded, placebo-controlled trial for children with monosymptomatic nocturnal enuresis (MNE) resistant to desmopressin.
- The predictive factors of children with MNE responsive to desmopressin and combination therapy were also evaluated.

PATIENTS AND METHODS

- Our sample included 206 patients aged between 6 and 13 (mean age 10.6 ± 2.9 years), 117 males. All patients were required to have MNE.
- The patients were randomly divided into two groups: the first group was given oral melt 120 µg and the second group 240 µg, for 2 weeks.
- All patients who had experienced failure of treatment with sublingually administered desmopressin alone were given either desmopressin plus 5 mg oxybutynin or desmopressin plus placebo in a randomized, double-blinded trial for 4 weeks.
- As predictive factors, bladder volume and wall thickness index, nocturnal polyuria and voiding latency were considered.

RESULTS

- There was no significant difference between the 120 µg and 240 µg patients in terms of response.
- The oxybutynin group showed a higher rate of full and partial responses (45% success) compared with the placebo group (17% success), $P < 0.01$.
- The responders to combined oxybutynin and desmopressin had significantly lower bladder volume and wall thickness index than the other patients.

CONCLUSIONS

- Our findings highlight that anticholinergic agents may play an important role for a subset of children with enuresis who have a restricted bladder capacity and thickened bladder wall.
- Ultrasonography-measured bladder variables can provide useful predictive clues for MNE.
- Predictive factors can help to differentiate treatment subtypes and guide clinical management in primary nocturnal enuresis.

KEYWORDS

desmopressin, nocturnal enuresis, oxybutynin

 | doi:10.1111/j.1464-410X.2011.10918.x