Evaluation of the Effectiveness of a Short-term Treatment and Repeat Treatment of Nocturnal Enuresis Using an Enuresis Alarm

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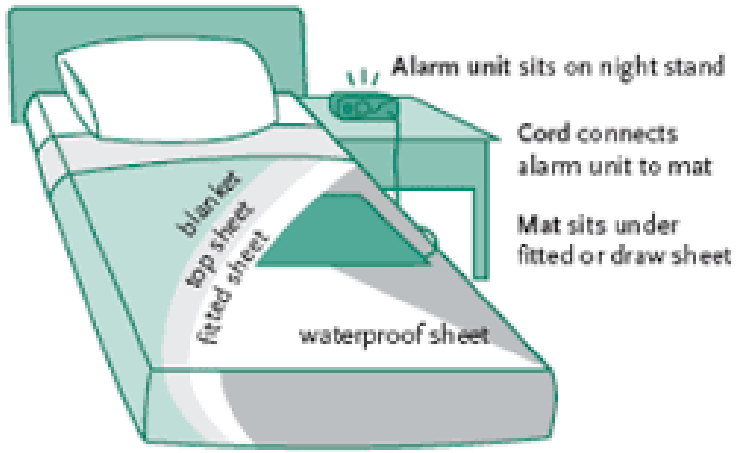

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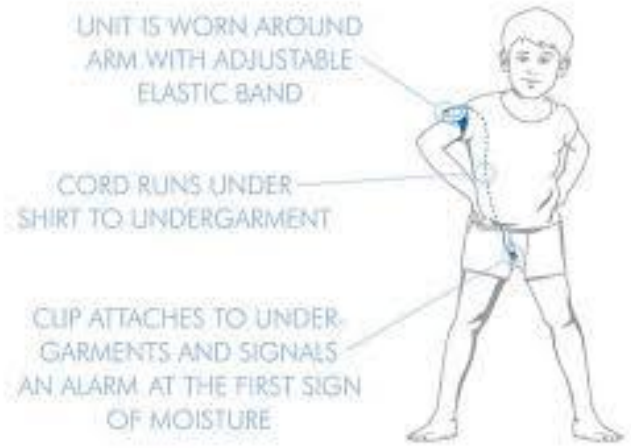
Introduction

- Enuresis :discrete episodes of urinary incontinence during sleep in children ≥ ٥ years of age
- Enuresis alarm (EA) is a standard treatment for nocturnal enuresis (NE)
- proven effectiveness to increase bladder capacity and improve arousal thresholds for NE
- EA was donned before sleep, When the EA was triggered, children were awakened by their parents to void in the toilet



Objective

- To evaluate the effectiveness of a ٣-month enuresis alarm (EA)
- repeat EA treatment
- patient characteristics among “responders” and “nonresponders” to treatment.
- duration of treatment associated with a negative therapeutic outcome.

Materials and Methods(Patient Selection)

- ۱۳۷ children (۹۴ boys and ۴۳ girls, mean age, ۱۰,۱ years)
- between April ۲۰۰۸ and September ۲۰۱۵
- Some with non-monosymptomatic NE (NMNE)
- children using other treatments, such as anticholinergic agents or antidiuretic vasopressin analog, EA was implemented ≥۱ month after.

Characteristics of all patients

	Patients (n = ١٣٧)
Age (mo)	١٢٠,٦ ± ١٩,٧
Frequency of NE (%)	٧٩,١ ± ٢٣,٢
Girl-to-boy ratio	٤٣:٩٤
Prior treatment	١٠٨ (٧٩%)
Simultaneous treatment	٦٢ (٤٥%)
Daytime urinary incontinence	١٦ (١٢%)

Materials and Methods(Standardized EA)

- First healthy lifestyle guidance and corrected bowel habits

- healthy lifestyle guidance
  - limit fluid intake within ٣ hours of bedtime
  - sleep and wake up earlier

- bowel movement
  - frequency less than ٣ times per week
  - frequency of hard stool (Bristol Stool Chart types ١-٢)≥ ٥٠%,
  - bowel pains ,anal bleeding
- Second EA and pharmaceutical treatments.

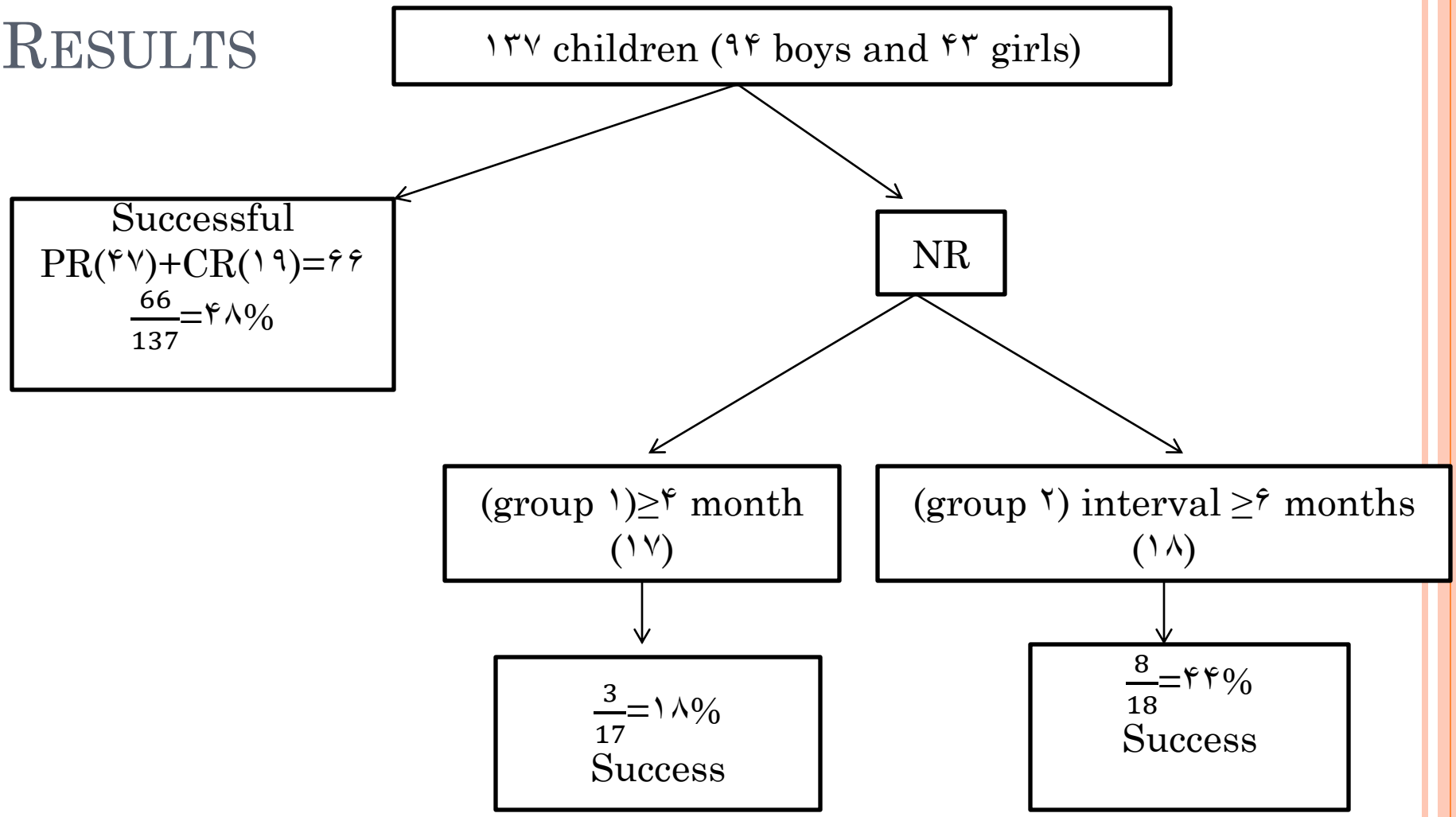
Materials and Methods(Clinical Evaluation)

- Effectiveness of EA treatment at ٣ months
- evaluated on a monthly basis, using the criteria of the International Children's Continence Society (ICCS)
- ١) successful
  - complete response (CR) → full resolution of NE
  - partial response (PR)→٥٠%-٩٩% decreased in NE
- ٢)no response (NR)→decrease in NE ≤٤٩%
  - group ١ → EA ≥٤ months
  - group ٢ → repeated the EA at an interval ≥٦ months

The comparisons of patient characteristics

	CR or PR Group (n = ۶۶)	NR Group (n = ۷۱)	P Value
Age (mo)	۱۱۹,۲ ± ۱۶,۱	۱۲۱,۸ ± ۲۲,۶	.۷۷
Frequency of NE (%)	۷۷,۸ ± ۲۳,۳	۸۰,۲ ± ۲۳,۱	.۵۲۲
Girl-to-boy ratio	۲۴:۴۲	۱۹:۵۲	.۲۷
Prior treatment	۵۰ (۷۶%)	۵۸ (۸۲%)	.۴۱۲
Simultaneous treatment	۲۸ (۴۲%)	۳۴ (۴۸%)	.۶۰۷
Daytime urinary incontinence	۶ (۹%)	۱۰ (۱۴%)	.۴۳۱

RESULTS


۱۳۷ children (۹۴ boys and ۴۳ girls)
Successful
PR(۴۷)+CR(۱۹)=۶۶
$\frac{66}{137}$=۴۸%
NR
(group ۱)≥۴ month
(۱۷)
(group ۲) interval ≥۶ months
(۱۸)
$\frac{3}{17}$=۱۸%
Success
$\frac{8}{18}$=۴۴%
Success

Discussion

- the period of treatment:
- Oredsson and Jorgensen → ۶ weeks too short for therapeutic effect
- the ICCS → EA treatment for least ۲-۳ months
- EA treatment → discontinued when it fails within ۶-۸ weeks → longer treatment :
- enormous burden on children with NE and their families
- Pation and family motivation ↓
- renders patient reluctant
- refuse the second course

Discussion

- EA treatment:
- EA was reported to influence the arousal threshold
- exert its effect by maturing the cognitive functions involving urination

- Because the bladder function and sleep-wake mechanism have not fully matured in patients with enuresis,-their maturation has a positive effect

- patients who did not respond to EA treatment were unlikely to respond to pharmacotherapy

Discussion

- patients with enuresis had more frequent daytime voiding symptoms,- indicating that immature bladder function is one of the causes of enuresis
- The ICCS reported that patients with daytime voiding symptoms were classified as non-MNE and did not respond well to EA
- Kajiwara et al reported that, ٤١% of patients were non-MNE
- an accurate diagnosis of voiding symptoms in children was difficult so borderline between MNE and non-MNE was unclear.
- another study showed that the efficacy of EA was comparable between MNE and non-MNE patients

Discussion

- The existing classification of MNE and non-MNE is based on daytime voiding symptoms

- therefore may not be essential for predicting the therapeutic effect of EA on nighttime bladder function.

- Our study including patients with non-MNE showed the efficacy of EA even in those with DUI, with no significant difference.

Discussion

Limitation :

- Retrospective design
- the response rate to EA treatment was low as compared with other studies
  - referral hospital
  - the average age is high(١٠,١>٨ years)
  - they examined the efficacy of EA alone
- sustainability was not assessed

Conclusion

EA treatment should be given for a short period of time and should not be continued without a definite purpose or a clear response. Suspending and then repeating treatment after an appropriate interval is effective for patients who do not respond to the initial course of treatment.

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