

The Pattern of Management of Nocturnal Enuresis in a Tertiary Hospital in Sudan

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ABSTRACT

Introduction: Childhood enuresis is a stressful condition for both family members and patients. Different strategies can be offered to manage this condition with variable success rates. Data on the treatment of enuresis are scarce in Sudan. We compared the efficacy of treatment with albendazole, desmopressin, and a combination of these two medications.

Methodology: This was a prospective randomized hospital-based study at Khartoum Children Hospital, Sudan. Children aged 5-15 years who presented with enuresis were recruited. Subjects were randomly assigned to one of three treatment groups (albendazole, desmopressin, or combination therapy) using a computer-generated table. The participants, pharmacists, and clinicians were aware of the treatment received by each individual.

Results: A total of 71 children were enrolled; 34 (47.9%) were men and 37 (52.1%) were women. All participants were offered counseling, motivation, and toilet training. Albendazole was administered to 17 children, desmopressin to 17 patients, and combination therapy was offered to 20 patients. Five patients initially responded to counseling, motivation, and toilet training. Nine of 17 (52.9%) patients responded well to albendazole, 8/17 (47.1%) responded to desmopressin, and finally, 15/20 (75%) responded to combined therapy. Twelve patients declined to continue the trial during non-pharmacological treatment.

Conclusion: Combined albendazole and desmopressin therapy seems to offer a better response in the treatment of children with enuresis.

Keywords: enuresis, albendazole, desmopressin, counseling, enterobias vermicularis

Conflict of interest: The authors declare no conflict of interest.

INTRODUCTION

Nocturnal enuresis is characterized by involuntary voiding of urine during sleep in children more than five years of age, with a frequency of two times per week over a period of more than three months (1-4). The affected child may be symptomatic from the start (primary enuresis) or may have a secondary period of dryness (secondary enuresis) (5, 6). Nocturnal enuresis may or may not be associated with day time symptoms (5, 6). The prevalence of enuresis is not accurately known in most of the world; however, more than five million people are thought to have this disease in the United States of America (2). In Sudan, many studies using a different definition of enuresis documented a prevalence ranging from 6.5% to 33.5% (3, 4, 7, 8). The pathophysiology of enuresis is attributed to the incoordination between arousal from sleep and the fullness of the urinary bladder beyond its ability to sleep (2).

Different treatment strategies have been postulated for different responses. Some of these interventions were simple, feasible, and acceptable and allowed families to adhere to them. Modalities of therapy include counseling, advice on toilet training, motivation, behavioral therapy, and medications (9). As the current data do not clearly show which pharmacological treatment option is superior, we

opted to conduct this study to compare the treatment response to albendazole and desmopressin alone or in combination.

PATIENTS AND METHODS

This prospective, randomized, hospital-based study was conducted at Khartoum Children Hospital, a leading referral pediatric hospital in Sudan over two years. The participants were children aged 5-15 years diagnosed with nocturnal enuresis (night bed wetting) according to standard diagnostic criteria (1-4). All patients who presented with nocturnal enuresis in the emergency room, outpatient clinic, and hospital wards were assessed for inclusion in the study. Children who presented with involuntary voiding of urine during sleep at a frequency of two times per week for more than three months were included. Children were excluded from the study if they had a known cause of enuresis, such as diabetes mellitus, diabetes insipidus, acute kidney injury, chronic kidney disease, or diuretic use. Consent was obtained from the parents or guardians. The first and second authors assessed the participants. A detailed medical history and clinical examination were performed. Information gathered included the age of onset, duration and frequency of enuresis, medical history, and

social history. Clinical examination included growth assessment, abdominal examination, and inspection of the genitalia. A case report form was used to collect data. All patients received non-pharmacological therapy, including counseling, advice on toilet training, motivation, and behavioral therapy, for 3 months. Patients who continued to have nocturnal enuresis two or more times a week were considered non-responsive to non-pharmacological treatment and were therefore included in this clinical trial. Alarm therapy was not used because it was not available at our hospital. Participants who satisfied the inclusion criteria and failed to respond to non-pharmacological therapy were randomly assigned to receive either albendazole (group 1), desmopressin (group 2), or a combination of the two medications. A computer-generated table was used for randomization. The patient, pharmacist, and treating clinician were all aware of the treatment assigned to each participant. Albendazole was administered at a single dose of 400 mg according to the World Health Organization (WHO) recommendations (10). Desmopressin was used at a dose of 0.2 mg titrated to a maximum dose of 0.6 mg to achieve the desired effect (9). The duration of pharmacological treatment was 6 months for each participant. At the end of the 6 month the participant were labelled by the authors as responsive to the intervention if no nocturnal enuresis was reported in the last three months. The participant was labelled as non-responsive to therapy if nocturnal voiding was reported once or more per week in the last three months of treatment.

Statistical Analysis: Data were analyzed using the Statistical Package for Social Sciences (SPSS, Version 17). Qualitative data were expressed as numbers and percentages. A p-value of less than 0.05 was used to determine the level of significance, and Student's t-test was used for analyses.

This study was approved by the ethics committee at Khartoum children hospital.

RESULT

In this study, 71 children with nocturnal enuresis were enrolled: 34 (47.9%) were men and 37 (52.1%) were women. Five patients responded initially to counseling, motivation, and toilet training, and 12 declined to continue non-pharmacological treatment. A total of 54 patients satisfied the diagnostic criteria for nocturnal enuresis and failed to respond to non-pharmacological treatment for 3 months.

Table 1: Treatment modalities for 54 children with nocturnal enuresis

Treatment modalities	Participants distribution according to the Sex			Number of participants responded from the group
	Male	Female	Total	
Albendazole	9	8	17	9 (52.9%)
Desmopressin	6	11	17	8 (47.1%)
Combined therapy	9	11	20	15 (75%)
Total	24	30	54	32

The p-value for treatment response < 0.003

The 54 participants were randomized to receive albendazole (n = 17), desmopressin (n = 17), or a combination of albendazole and desmopressin (n = 20). Nine of 17 (52.9%) patients responded well to albendazole, 8/17 (47.1%) responded to desmopressin, and 15/20 (75%) responded to combined therapy (p <0.003) (Table 1).

DISCUSSION

Currently, there is no consensus regarding the management of nocturnal enuresis. Most authorities consider behavioral therapy, such as counseling and family training, as the first option for the management of children with enuresis (11). Others recommend a combination of alarm therapy and toilet training rather than using each alone (12). Most pediatricians prescribe desmopressin to children with enuresis when non-pharmacological interventions fail. However, others preferred to start children with enuresis on antidepressants. Recently, albendazole has emerged as an alternative treatment for nocturnal enuresis (13). In this study, we conducted a randomized, open-label clinical trial to compare monotherapy using albendazole or desmopressin with the combination of these two medications. We found that combination therapy with albendazole and desmopressin for nocturnal enuresis showed a better response than monotherapy, as 75% of the patients who received combination therapy achieved a good response. Interestingly, only 52.9% of the participants who received albendazole had a good response.

To the best of our knowledge, this is the first study in Sudan to discuss the pattern of treatment for enuresis; however, previous studies in Sudan by Rahim et al., Karimeldin et al., and Fatahelrahman et al. explored the epidemiology of nocturnal enuresis in the country (3, 4, 8).

Iquo et al. conducted a study on Nigerian children with nocturnal enuresis and showed that more than 40% of children with enuresis responded well to albendazole (14). This is in agreement with our study, which showed a 52.9% response to albendazole monotherapy. Furthermore, 75% of the patients who received a combination of albendazole and desmopressin showed a good response. Albendazole is commonly used to treat *E. vermicularis*. This infection is prevalent among Sudanese children, with 7.4% being infected in one study (15). We did not perform stool analysis in our cohort to determine whether the participants were infected with this parasite. The mechanism of action of albendazole in the treatment of nocturnal enuresis is unclear. Itching associated with *Enterobius vermicularis* infection may predispose patients to enuresis. Therefore, elimination of this infection by albendazole may decrease itching and cure enuresis.

The combined therapy of enuresis and albendazole has proven successful in the management of enuresis (16). A study conducted by Otu-Bassey et al 2011 among a large number of Nigerian children showed a dramatic response in children with enuresis after administration of 400 mg of albendazole given as a single dose (17). Many theories support a strong association between enterobiasis, premium itching, and enuresis (17,18,19). Therefore, it is not surprising to obtain a good response for enuresis when albendazole is added to the combined therapy, which is supported by other studies (18).

In conclusion, we have shown in this study that combined therapy with albendazole and desmopressin is better than monotherapy.

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