

Parents Function and Behavioral Disorders in Children with and without Diurnal Voiding Dysfunction: A Comparative Study

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Article information	Abstract
<p>Article history: Received: 21 June 2012 Accepted: 10 Aug 2012 Available online: 9 Jan 2013 ZJRMS 2014 Sep; 16(9): 1-4</p> <p>Keywords: Voiding dysfunction Behavioral disorder Function Parent Diurnal enuresis</p> <p>*Corresponding author at: Student of Medicine, Student Research Committee, Arak University of Medical Sciences, Arak, Iran. E-mail: dr.firouzifar@arakmu.ac.ir</p>	<p>Background: Diurnal voiding dysfunction is one of the most common causes of pediatric urology clinic admissions. It can cause behavioral problems for children and their parents. We lunch this study to compare the parents' function and children's behavior problem in pediatric patients suffering from diurnal voiding dysfunction referring Arak Amir Kabir hospital.</p> <p>Materials and Methods: To perform this case-control study, we recruit 116 children with diurnal voiding dysfunction and compared them with other 116 children non-affected children aged between 5 to 16 years old. The child behavior checklist (CBCL4/18) for children behavior assessment and Global Assessment of Functioning (GAF) for the evaluation of their parent's behavior was completed by the parents. Data was analyzed using ANOVA, qualitative variables and χ^2 formula.</p> <p>Results: Among 116 patient with voiding dysfunction, 10 case (8.6%) showed behavioral problem while this figure was 3 case (2.6%) in the control group, denoting a significant difference ($p=0.04$). Moreover 20 children (17.2%) in the case group and 9 children (7.8%) in the control group had internalizing problem ($p=0.02$). Twenty two children (19%) with voiding dysfunction and 8 children (6.9%) in the healthy group had externalizing problem which was also a significant difference ($p=0.01$).</p> <p>As a significant difference (0.01), the parent's average stress and behavior scores in case and control group were 3.65 and 3.76, respectively.</p> <p>Conclusion: The higher prevalence of behavioral problem in the children suffering from diurnal voiding dysfunction and their parent's functional impairment highlights the importance of early parent's intervention for early treatment and subsequently prevention of future behavioral problem in their sibling.</p> <p>Copyright © 2014 Zahedan University of Medical Sciences. All rights reserved.</p>

Introduction

Voiding disorder is a common term for any problem regarding the voiding process. It is a very common problem in childhood and is linked with 40% of pediatric urology clinic admissions [1]. Diurnal voiding dysfunction as described by Diagnostic and Statistical Manual of Mental Disorders version IV (DSM IV) is referred to repeated wetting of clothes or bed in children aged 5 or older, 2 times a week for at least 3 months [2]. It can cause a lot of stress in school age children and can affect their behavior and performance and may have negative effects on their self esteem [3-5]. Correlation between diurnal voiding dysfunction and behavioral problems (internalizing and externalizing problems) like attention deficit hyperactivity disorder (ADHD) [6] is well described. It is said that the prevalence of behavioral problems in 5-15 year old children with voiding dysfunction is 2 times higher than control group [7]. But there is a major neglected point regarding the behavioral problems following voiding dysfunction. Parental function can have an impact on child's behavioral problems and vice versa. It is said that

parental stress is escalated in children with a chronic developmental condition and therefore their ability to cope and help the child cope with this situation is decreased [8, 9]. In the course of therapy there is a time in which the child is dismissed from health services and has to improve on his/her own family environment. If this environment provides good conditions, the course of therapy would be more successful [8]. On the other hand, parental function plays an important role in perceiving child's problems. For example maternal depression has an impact on her perception of the child. Depressed mothers perceive more behavioral problems in their child and the children of depressed mothers have increased levels of internalizing and externalizing problems [10]. This is also important as parents see the children in their home condition and the diagnosis of some conditions like behavioral problems are made by their statements so if their stress tampers with their perception, diagnosis is going to be difficult [11]. Parents' function and behavioral problems in children with diurnal voiding dysfunction is yet to be evaluated. In this article we want

to evaluate this function and its relation with behavioral problems and compare it with parents of children without voiding dysfunction.

Materials and Methods

In this case-control study, we selected 116 children with diurnal voiding dysfunction (DVD) based on DSM IV criteria [2] as case and 116 children without voiding dysfunction (NDVD) as control group, who were all admitted in Amir-Kabir hospital, Arak, Iran. The sample size calculation was made after previous studies, though we extended our sample size to get better visualization over behavioral disorders [12, 13]. Our exclusion criteria were: 1) Children with known underlying kidney disease or genitourinary problems, 2) Children with psychological disorders and/or mental retardation or nervous system disorders, 3) Children whose parents didn't cooperate fully e.g. not filled the forms completely or had any will to exit the study.

The control group were selected from pediatric patients with other complaints like trauma, stomach pain, back pain and common cold considering the exclusion criteria. After primary evaluation regarding exclusion/inclusion criteria, basic information (age, sex, etc.) was recorded. Then child's behavioral status was evaluated using child's behavioral checklist (CBCL). The CBCL is a standard checklist which measures emotional, social and behavioral problems in 4 to 18-year-old children [14]. Parents rate the child on 113 items on a 3-point Likert scale of 0 (not at all) to 2 (much). The CBCL consists of 8 scales, including withdrawal, somatic complaints, anxiety/depressive, social problems, thought problems, attention problems, delinquent behavior and aggressive behavior. The first 3 syndrome scales can be grouped into the internalizing and the latter two can be grouped into the externalizing problems. All items together are referred to as total behavioral problem scale [11]. Then, parents were asked to fill Global Assessment of Functioning (GAF) questionnaire. This questionnaire consists of 15 questions with a 4-point likert scale from 0 (never) to 4 (always) which is used to evaluate patient's total functioning level [2]. Both these questionnaires have been tested for reliability in a pilot study by researchers with 30 patients in each of the case and control groups and cronbach's alpha were 0.93 for CBCL and 0.87 for GAF. Results were analyzed using SPSS-16 by means of descriptive analyzes for basic information, ANOVA for multivariate factors regarding behavioral problems and Chi-square for qualitative variables. *p*-value of lower than 0.05 was considered meaningful in our comparisons. This study was confirmed by ethic's committee of Arak University of Medical Sciences and in all stages of this study, we were loyal to Helsinki declaration principles and a written consent was obtained from all of participants and they were free to exit the study by their will.

Results

Overall 232 children (116 as case and 116 as control group) were selected for our study. Demographic data are

shown in table 1. Comparison of groups regarding different behavioral problems and parents' function can be seen in table 2. Results showed significant difference in all of the categories. Also the following results showed the percentage and number of children whose score were in clinical range in each category. In total behavioral problems, score of 8.6% (10) of DVD children was within clinical range (more than 62) while it was 2.6% (3) in NDVD children ($p=0.046$). Regarding internalizing problems score of 17.2% (20) of DVD children was within clinical range (more than 21) while it was 7.8% (9) in NDVD children ($p=0.029$). About externalizing problems, for 19% (22) of DVD children, the score was within clinical range (more than 21) while it was 6.9% (8) in NDVD children ($p=0.01$). In 9.5% (11) of DVD children and 2.6% (3) of NDVD children, the score of attention and hyperactivity disorder was within clinical range (more than 9) ($p=0.026$). And finally regarding anxiety/depressive problems, for 12.9% (15) of DVD children, the score was within clinical range (more than 11) while it was 3.4% (4) in NDVD children ($p=0.01$).

Table 1. Demographic data of the study groups

Sex	Case (N%)	Mean age of case group	Control (N%)	Mean age of control group(yr)
Boy	50(43)	7.7	57(49)	7.4
Girl	66(57)		59(51)	

Table 2. Comparison of parents' function and behavioral problems in children with (case) and without (control) diurnal voiding dysfunction. Mean and SD (standard deviation) of both groups are compared to each other

Problem	Case Mean±SD	Control Mean±SD	<i>p</i> -Value
Total behavioral problems	25.18±2.08	18.24±1.97	0.04
Internalizing problems	8.17±9.31	5.6±8.23	0.021
Externalizing problems	9.4±9.86	8.6±1.03	<0.01
ADHD	4.63±6.3	2.57±3.2	0.02
Anxiety/depressive disorders	3.09±3.6	2.15±3.18	0.01
Parents' function and stress	3.65±0.31	3.76±0.26	0.01

Discussion

In this article we compared behavioral problems in children with and without diurnal voiding dysfunction and their parental functioning. To our knowledge, it is the first article, studying parents' function in children with voiding dysfunction. The data revealed that the mean score of total behavioral problems in DVD children was 25.18 against 18.24 in NDVD children. The incidence of behavioral problems was three times higher in DVD compared to NDVD children which was in agreement with other results by von Gontard et al. [7], Joinson et al. [15] and Kodman-jones et al. [16]. Seventeen Point two Percent of DVD and 7.8% of NDVD children were in clinical range of internalizing problems which means there is a 2-3 fold increase of internalizing problems in DVD children. This comes close to the article by von Gontard et al. [7] which suggested that there is a 2 fold increase in internalizing problems in children with urge incontinency and void postponement. Nineteen Percent of

DVD children and 6.9% of NDVD children were in clinical range of externalizing problems which is in agreement with von Gontard et al. [7], Joinson et al. [15].

van Hoecke et al. [12] evaluated the internalizing and externalizing disorders in children with nocturnal and diurnal enuresis in a cross sectional study. They used CBCL as one of their study tools and they found that internalizing, externalizing and total behavioral problems were significantly different between enuresis group and control group. They also found a significant difference regarding ADHD between the case and control groups. These findings are in accordance with our study. In terms of attention deficit and hyper activity, the score of 9.5% of DVD children and 2.6% of NDVD children were in clinical range. Kodman-jones et al. [16] reported that the incidence of ADHD in children with day time wetting is 21% which is higher than our results. In one of our previous studies [6] in which we used conner's questionnaire for ADHD assessment, we found that the rate of ADHD in enuretic children is 16%. Regarding the anxiety/ depressive disorders, van Hoecke et al. [17] tried to involve the children in their study in which they came to a result that there is no evidence of internalizing problems (anxiety/depression) and low self-esteem in the self-report of enuretic children. In contrast parents rate enuretic children as having more internalizing problems. They used the CBCL as their study tool and their results are similar to ours. In this study the mean score of functioning in parents of DVD children was 3.65 and it was 3.76 in parents of NDVD children which shows a significant decrease in parental function of DVD children ($p=0.01$). De Bruyne et al. [13] assessed the parental stress regarding the behavioral problems in children with and without enuresis. They determined maternal and paternal ratings of problem behavior in 5 to 13-year-old children with (non) monosymptomatic enuresis and investigated parental stress and the association between parental ratings of child behavior and parental stress. They used CBCL, disruptive behavior disorder rating scale for child's behavioral problems and parental stress index for parental stress. Mothers and fathers of enuretic children reported significantly higher scores on the disruptive behavior disorders rating scale inattention, hyperactivity/impulsivity and oppositional defiant disorder subscales than parents of children without

enuresis. The parenting stress index revealed significantly higher overall stress in mothers and fathers of children with (non) monosymptomatic enuresis compared with that in parents of controls. Their study is very much similar to ours but they used different tool for assessment of parental stress. Considering our sample size and methods used, we were able to minimize the errors to some extent. But there might be some problems in our control group selection in which we used only the in-patients. Other disease would have some impact on the parental functioning and behavioural problems in children considering their severity and chronicity [18]. We tried to decrease these errors using only the patients with mild and easily treatable complaints as our case group to lessen the impact of the disease on their behaviour or their parents' functioning level. Voiding dysfunction is one of the most common urological problems in children which is linked with 40% of clinical admissions. Our results showed a higher incidence of behavioral problems in children with diurnal voiding dysfunction which has an impact on the function of parents. It also can debilitate the parents to look after their children in their recovery. So if these functional disorders are diagnosed and treated properly, behavioral problems in children can be prevented or more easily treated.

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Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

Conflict of Interest

The authors declare no conflict of interest.

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References

1. Farhat W, Bagli DJ, Capolicchio G, et al. The dysfunctional voiding scoring system, quantitative standardization of dysfunctional voiding symptoms in children. *J Urol* 2000; 164(3 pt 2): 1011-1015.
2. Sadock BJ, Sadock VA. Kaplan & Sadocks synopsis of psychiatry behavioral sciences/clinical psychiatry. 10th ed. Philadelphia: Lippincott Williams & Wilkins; 2007: 395.
3. Anderson GE, Jameson SR, Whipple AD. Student rating of stressful experiences at home & school: Loss of parent and grade retention as suporative stress. *J Appl School Psychol* 2005; 21(1): 1-20.
4. Ollendie TH, King NJ, Frary RB. Fear in children and adolescent: Reliability and generalizability across gender, age and nationality. *Behav Res Ther* 1995; 27(1): 19-26.
5. Hogllof B, Anderson O, Bergstrom E. Selfsteam in children with nocturnal enuresis and urinary incontinency: Improvement at selfsteam after treatment. *Eur Urol* 1998; 33 Suppl 3: 16-19.
6. Yousefi P, Salehi B, Firouzifar MR and Sheikholeslami H. The correlation between attention deficit hyperactivity disorder and enuresis in children with nocturnal enuresis. *J Isfahan Med School* 2012; 30(184): 1-8.
7. Von Gontard A, Lettgen B, Olbing H, et al. Behavioral problem in children with urge incontinency and voiding postponement: A comparison of a peadiatric and child psychiatric sample. *Br J Urol* 1998; 81 Suppl 3: 100-6.
8. Bagner DM, Sheinkopf SJ, Miller-Loncar C, et al. The effect of parenting stress on child behavior problems in

- high-risk children with prenatal drug exposure. *Child Psychiatry Hum Dev* 2009; 40(1): 73-84.
9. Crawford NA, Schrock M, Woodruff-Borden J. child internalizing symptoms: Contributions of child temperament, maternal negative affect, and family functioning. *Child Psychiatry Hum Dev* 2011; 42(1): 53-64.
 10. Luoma I, Koivisto AM, Tamminen T. Fathers' and mothers' perceptions of their child and maternal depressive symptoms. *Nord J Psychiatry* 2004; 58(3): 205-11.
 11. Achenbach TM, McConaughy SH, Howell CT. Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychol Bull* 1987; 101(2): 213-32.
 12. Van Hoecke E, de Fruyt F, De Clercq B, et al. Internalizing and externalizing problem behavior in children with nocturnal and diurnal enuresis: A five-factor model perspective. *J Pediatr Psychol* 2006; 31(5): 460-8.
 13. De Bruyne E, van Hoecke E, van Gompel K, et al. Problem behavior, parental stress and enuresis. *J Urol* 2009; 182(4): 2015-2020.
 14. Kaplan HI, Sadock BJ. *Comprehensive textbook of psychiatry*. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 1995: 558.
 15. Joinson C, Heron J, Emond A and Bulter R. Psychological problems in children with bedwetting and combined (day and night) wetting: A UK population-based study. *J Pediatr Psychol* 2007; 32(5): 605-16.
 16. Kodman-Jones C, Hawkins L, Schulman SL. Behavioral characteristics of children with daytime wetting. *J Urol* 2001; 166(6): 2392-95.
 17. Van Hoecke E, Hoebeke P, Braet C and Walle JV. An assessment of internalizing problems in children with enuresis. *J Urol* 2004; 171(6 Pt 2): 2580-3.
 18. Chambers PL, Mahabee-Gittens EM, Leonard AC. Vulnerable child syndrome, parental perception of child vulnerability, and emergency department usage. *Pediatr Emerg Care* 2011; 27(11): 1009-13.

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