



## Psychogenic diabetes insipidus – A case report of behavioral psychotherapy

### Psihogeni dijabetes insipidus – prikaz bihevioralne psihoterapije

Miodrag M. Stanković<sup>\*†</sup>, Jelena Stevanović<sup>‡</sup>, Aleksandra Stojanović<sup>\*</sup>,  
Sandra Stanković<sup>§</sup>

University of Niš, <sup>\*</sup>Faculty of Medicine, Niš, Serbia; Clinical Centre Niš, <sup>†</sup>Center for Mental Health Protection, <sup>‡</sup>Clinic for Children's Internal Diseases, Niš, Serbia; <sup>§</sup>General Hospital, Leskovac, Serbia

#### Abstract

**Introduction.** Psychogenic diabetes insipidus is potentially a life-threatening condition manifesting as a psychogenic thirst disorder with excessive fluid intake (more than 3 L per day) and a preserved function of neurohypophysis and kidneys. **Case report.** We presented a boy aged 4 years and 8 months with symptoms of polydipsia, polyuria, nocturia and malnutrition. Pediatric examination and laboratory analysis were performed, but clear discrimination between psychogenic and nonpsychogenic diabetes insipidus could not be made. A psychiatric consultation was performed to examine the possibility of compulsive fluid taking. The differentiation was performed in two stages. In the first stage, the child was separated from the mother in short intervals. In the second stage, the behavioral psychotherapy interventions were performed: distraction of attention, and positive and negative reinforcement for delaying compulsive fluid taking. The mother was trained to use methods of operant conditioning,

privilege and deprivation, as well as methods of exposure and response prevention and relaxation of the child. It was suggested to continue with multidisciplinary treatment (pediatric, liaison psychiatric and behaviour psychotherapeutic). Evaluation of behaviour therapy was performed after 4 and 12 weeks. During 4 weeks of follow-up, the boy reduced the daily fluid intake by 3.5 L, and added 1 kg of body weight. Also, intervals between fluid intake were significantly extended. This therapeutic effect could not be explained by the pediatric treatment introduced prior to the application of behaviour therapy and psychoeducation of the mother. **Conclusion.** Consultations and multidisciplinary approach by different health specialists in resolving of a number of predominantly somatic disorders in children with psychogenic diabetes insipidus should be highlighted as a way of treatment.

**Key words:**  
behavior therapy; child; diabetes insipidus; diagnosis; psychotherapy; treatment outcome.

#### Apstrakt

**Uvod.** Psihogeni dijabetes insipidus je potencijalno životnougrožavajuće stanje koje se manifestuje kao poremećaj žeđi sa ekscesivnim unosom tečnosti (više od 3 litre dnevno) i očuvanom funkcijom neurohipofize i bubrega. **Prikaz bolesnika.** Prikazan je dečak uzrasta 4 godine i 8 meseci sa simptomima polidipsije, poliurije, noćurije i malnutricije. Pedijatrijskim ispitivanjem i učinjenim laboratorijskim analizama nije postavljena jasna diferencijalna dijagnoza između psihogenog i nepsihogenog dijabetesa insipidusa. Psihijatrijska konsultacija imala je za cilj sagledavanje mogućnosti postojanja kompulzivnog uzimanja tečnosti i primenu terapije sprečavanja. Diferencijacija se odvijala u dve etape. U prvoj etapi dete je odvojeno od majke u kraćim intervalima, a u drugoj fazi uključene su bihevioralne intervencije: distrakcije pažnje i pozitivno i negativno potkrepljivanje odlaganja kompulzivnog uzimanja tečnosti. Majka je obučavana metodama operantnog uslovljavanja,

nagrađivanja i uskraćivanja privilegija, kao i metodama izlaganja, sprečavanja i relaksacije deteta. Predložen je nastavak multidisciplinarnog lečenja (pedijatrijskog, konsultativno psihijatrijskog i bihevioralno psihoterapijskog). Procena efekata bihevioralne terapije, sagledana je nakon četiri i dvanaest nedelja. Dečak je smanjio dnevni unos tečnosti za 3,5 L, a dobio je 1 kilogram u telesnoj masi, uz značajno produženje intervala u uzimanju tečnosti. Postignuti terapijski efekat nije mogao biti objašnjen pedijatrijskim tretmanom uvedenim pre primene bihevioralne terapije i psihoedukacije majke. **Zaključak.** Konsultacije i multidisciplinarni pristup različitih profila zdravstvenih radnika u rešavanju predominantno somatskih poremećaja psihogenog dijabetesa insipidusa kod dece treba da budu istaknuti kao način lečenja.

**Ključne reči:**  
bihevioralna terapija; deca; dijabetes insipidus; dijagnoza; psihoterapija; lečenje, ishod.

## Introduction

Psychogenic diabetes insipidus (psychogenic – primary polydipsia) is a psychogenic thirst disorder with excessive fluid intake (more than 3 L *per* day) and a preserved function of neurohypophysis (the posterior pituitary) and kidneys<sup>1</sup>. In a prolonged period of time, daily intake of large amounts of fluid results in the development of a functional form of diabetes insipidus, with dilution of extracellular fluid, inhibition of antidiuretic hormone secretion and aqueous diuresis<sup>2</sup>. The clinical presentation is dominated by poliuria with nocturia, followed by extreme thirst and fluid intake (polydipsia). The daily amount of urine output varies, ranging from 16 L to 20 L in severe, to 2.5 L to 6 L in milder cases<sup>3</sup>. Urinating is frequent, at intervals of 30–60 min throughout the day and night. The urine is clear and colorless, with low specific gravity and reduced osmolality. The patients are tired and sleepy, often suffering from constipation. This is potentially a life-threatening condition with a constant risk of dehydration and hypovolemia<sup>4</sup>. Diagnosis and treatment of psychogenic insipid diabetes in children often requires liaison approach, engaging several professionals of various specialties: pediatric endocrinologists and nephrologists, child psychiatrist, psychologist<sup>5</sup>. There is a small number of case reports of psychogenic polydipsia in preschool children, and even fewer reports of non-pharmacological therapeutic approaches<sup>6</sup>, which makes this article more significant.

We presented a case of diabetes insipidus treated by behavioral psychotherapy highlighting the importance of a paediatric psychiatrist in collaborative work, diagnosis and treatment of psychologically conditioned states with predominantly somatic clinical manifestations and potentially serious somatic complications.

## Case report

A boy aged 4 years and 8 months with symptoms of polydipsia, poliuria, nocturia and malnutrition (failure to thrive, body mass under -5.3 SD) was hospitalized at the Clinic for Children's Internal Diseases, Clinical Center Niš, Niš, Serbia. Data indicated that mentioned symptoms, with gradual decrease of appetite, had been present during the several months. Child's fluid intake was up to 5.5 liters a day, followed by frequent urination. During the hospitalization, diuresis and fluid intake were closely monitored. Extensive laboratory tests were performed (blood count, biochemical analysis, acid-base and hormone status, general and biochemical urine examination, the chloride concentration in sweat). Craniography, and kidney and abdomen ultrasonographic examination did not indicate any significant pathological changes. Nuclear magnetic resonance (NMR) imaging revealed a change in the pituitary gland which diagnostically correlated with microadenoma. The tubular function of the kidneys was normal. In consultation with

the endocrinologist, a fluid deprivation test was performed. The test results were inconsistent with severe symptoms and malnutrition revealing partial deficit of the antidiuretic hormone. The diagnosis of a partial neurohormonal diabetes insipidus was made, and desmopresine nasal spray was administered (10 mcg, twice daily). Although repeated analysis were performed, a psychogenic diabetes insipidus could not be excluded. During the first month of follow-up, the boy continued to take more fluid than expected, which indicated a presence of compulsive behavior. Finally, a psychologist and a psychiatrist were consulted. The examination showed psychomotor development of the boy within expected limits. The patient lives with his mother in an incomplete nuclear family, as the first and only child. Some chronic somatic disorders in the family history were found, mostly cardiovascular ones and epilepsy. There were no data on psychiatric heredity in the context of a close family. During the examination, the boy showed average intellectual scores. He did not exhibit symptoms of neurodevelopmental disorders. Preoccupation with water intake was excessive, persisting and potentially a life-threatening. Water intake was repetitive, volitional and in response to preoccupation. The child was not able to articulate the aim of his behavior. Repetitive behavior was taking more than 1 h per day and cause significant impairment in social functioning. Behavior could not be attribute to the effects of substance, and was not better explained by another mental disorder. A diagnostic interview with the mother pointed to the absence of a structured educational approach, without structured mechanism of privilege and deprivation. Relationship of parent-child was significantly perturbed [Parent-Infant Relationship Global Assessment Scale (PIR-GAS) score 60], mother-child relationship was less than optimal and mother was distressed at home which put development progress of the dyad at risk. Bearing in mind that the use of antidiuretic hormone in the therapy did not lead to improvement of the condition and that behavioral analysis indicated the possibility of compulsive taking of the fluid, we assumed that the disorder was psychogenic.

### *Applied behavioral therapy*

Behavioral therapy was carried out in two stages during 3 sessions. In the first stage, the boy was separated from his mother in an half hour time, and during that time he did not exhibit compulsive behavior nor the anxiety over staying alone with a stranger. In the second phase (another half hour), behavioral interventions were applied: distraction of attention, positive reinforcement for delaying compulsive fluid intake during occupational activities, and a negative reinforcement with the exclusion of mothers' aversive comments when rejoining the child. During three consecutive days, the procedure was repeated with prolonging the second phase for 30 more minutes with the possibility of reunion with the mother after 60 min for a period of 5 minutes. The boy was

allowed to take fluid after 90 min, which meant once during the second phase.

Advising the mother about modification of the child's behavior included psychoeducation (cognitive therapy) and a video footage of working with the child (model learning). It was suggested for fluid intake to be limited to 6 times a day, taking a maximum of 350 mL per taking. Using a substitution such as chewing gum, a small piece of ice, a bottle with a dozer and small sips was suggested. The principle of behavior change by methods of positive and negative reinforcement (operant conditioning) was explained in details, with token economy, tables and stickers.

#### *Follow-up*

Evaluation of psychotherapeutic effects was performed after 4 and after 12 weeks. The mother kept a diary of daily fluid intake, body weight and diuresis of the child. By the first visit, the boy reduced daily fluid intake by 3.5 L, and added 1 kg of body weight with extension of the intervals between fluid taking to a total of 6 times a day. The effects sustained on the second visit. The achieved therapeutic effect could not be explained by pharmacotherapeutic treatment (desmopresine) that did not have an effect on compulsive behavior prior to the application of behavioral therapy and psychoeducation of the mother.

#### **Discussion**

We described a preschool child with a clinical presentation of diabetes insipidus. Extensive nephrological, endocrinological, laboratory and neuroimaging examinations indicated a partial deficit of antidiuretic hormone and a clinically non-significant pituitary gland microadenoma. Partial neurohormonal diabetes insipidus was diagnosed. Deficit of antidiuretic hormone was supplemented without an effect on excessive fluid intake.

The psychiatric examination was performed to exam the possibility of compulsive fluid taking on the field of insufficiently explained somatic diabetes insipidus. Medical causes of polydipsia, polyuria, and/or hyponatremia were ruled out through pediatric examinations.

Psychogenic diabetes insipidus, as a psychological component, presents compulsive fluid intake. It differs from developmentally normative preoccupations and rituals

by being excessive or persisting beyond the developmentally appropriate age, and cannot be better explained as a direct consequence of another medical condition<sup>7, 8</sup>. Compulsive fluid intake is not classified in psychiatric classifications, but could be viewed as repetitive behavior and respond to the preoccupations, or could be some form of recurrent body focused repetitive behavior. Assessing the relationship of the parent-child dyad, which was significantly perturbed, made possibilities that such a relationship with a little relaxed enjoyment caused anxiety and compulsions that reduced the child anxiety. Differential-diagnostic considerations of the occurrence of clinical manifestations in the time frame indicate that dyad relationship was primarily impaired, and the association of compulsive fluid and coexistence of diabetes insipidus was secondary. This is supported by the fact that behavioral therapy was effective, and that the previously applied therapy was ineffective. The effectiveness of behavioral therapy has been previously reported in a follow-up case<sup>6</sup>. The ability to delay compulsive fluid intake in controlled conditions followed with attention distraction and positive and negative reinforcement, pointed to the importance of the psychogenic component in the appearance and maintenance of the disorder.

The focus of behavioral therapy was controlling the stimuli, and restriction of fluid intake, which included dominantly operant conditioning. Psychoeducation and cognitive therapy of the mother were an integral part of the therapy, aimed at reducing anxiety in the dyad relationship. The effectiveness of the proposed methods of behavioral modification in further psychotherapeutic work confirmed assumption that initially had been made. The achieved therapeutic effect could not be explained by the pediatric pharmacotherapy introduced prior to the application of behavioral therapy and psychoeducation of the mother.

#### **Conclusion**

The importance of this case report is to emphasize the importance of liaison and multidisciplinary approach (pediatrician, child psychiatrist, psychologist, psychotherapist) in diagnosis and therapy of a number of predominantly somatic disorders in children with psychogenic diabetes insipidus.

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