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Case Report / Приказ болесника

Zoran Leković[1,2], Vladimir Radlović[1,2], Nevena Jovičić[2], Goran Đuričić[1,2], Marija Mladenović[3], Ivana Dašić[2], Nedeljko Radlović[4,♣]

Rotavirus gastroenteritis as a precipitating factor of celiac crisis in infancy – case reports and review of literature

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[1]University of Belgrade, Faculty of Medicine, Belgrade, Serbia;
[2]University Children's Hospital, Belgrade, Serbia;
[3]Valjevo Health Centre, Valjevo, Serbia;
[4]Serbian Medical Society, Academy of Medical Sciences, Belgrade, Serbia

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♣**Correspondence to:**
Nedeljko RADLOVIĆ
Academy of Medical Sciences of the Serbian Medical Society, Džordža Vašingtona 19,
Belgrade 11000, Serbia
E-mail: **n.radlovic@beotel.net**

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SUMMARY

Introduction Celiac crisis is a rare and life-threatening complication of celiac disease. Although it occurs in all ages, the most common affects children within the first two years.

Outline of cases We report three infants (two female, one male, age range 9–12) with celiac crises as an initial presentation of celiac disease precipitated with rotavirus gastroenteritis. Celiac crisis was preceded by failure to thrive caused by anorexia, occasional vomiting and frequent abundant stools for 4–8 weeks, and 1–2 days before admission with fever, frequent vomiting and profuse watery diarrhea. They were admitted in a very severe general condition, severely dehydrated, markedly malnourished, with an enormously distended abdomen, edema of the lower legs and feet, and perianal erythema. After correction of dehydration and hypoalbuminemia, they were placed on a gluten- and disaccharide-free diet and within the first 2 weeks on additional parenteral nutrition. The applied therapeutic measures resulted in stabilization and further rapid improvement of the patient's condition. In all three patients the latex agglutination test for rotavirus was positive, IgA anti-TTG antibodies elevated (58.6 to 78 U/ml) and all three were homozygous carriers of the HLA DQ2 gene. Enterobiopsy was performed two weeks after admission and total villous atrophy (Marsh IIIc) was registered in all three patients. In the further course, on a strict gluten-free diet, the complete recovery of the patient followed.

Conclusion Our experience indicates that rotavirus gastroenteritis in timely unrecognized classical celiac disease in infants can lead to celiac crisis.

Keywords: celiac crisis; infants; rotavirus gastroenteritis

САЖЕТАК

Увод Целијачна криза је ретка и животно угрожавајућа компликација целијачне болести. Иако се јавља у свим добима, најчешће погађа децу унутар прве две године.

Приказ болесника Приказујемо три одојчета (два женског и једно мушког пола, узраста 9–12 месеци) са целијачном кризом као иницијалном презентацијом целијачне болести преципитирану ротавирусним гастроентеритисом. Целијачној кризи је претходио поремећај напредовања узрокован анорексијом, повременим повраћањем и честим обилним столицама 4–8 недеља и 1–2 дана пре пријема повишена температура, често повраћање и профузна водена дијареја. Примљена су у врло тешком општем стању, тешко дехидрирани, изразито потхрањени, са енормно дистендираним трбухом, едемом потколенице и стопала и перианалним еритемом. Након корекције дехидрације и хипоалбуминемије, стављени су на дијету без глутена и дисахарида и унутар прве 2 недеље на додатну парентералну исхрану. Примењене терапијске мере су резултирале стабилизацијом и у даљем току брзим побољшањем стања болесника. Код сва три болесника латес аглутинациони тест на ротавирус био је позитиван, антитела *IgA* анти-*TTG* повишена (58,6–78 *U/ml*) и сва три су били хомозиготни носиоци гена *HLA DQ2*. Ентеробиопсија је урађена две недеље након пријема и код сва три пацијента је регистрована тотална вилозна атрофија (*Marsh IIIc*). У даљем току, на строгој дијети без глутена, уследио је потпуни опоравак пацијента.

Закључак Наша искуства указују да ротавирусни гастроентеритис код благовремено непрепознате класичне целијачне болести код одојчета може довести до целијачне кризе.

Кључне речи: целијачна криза; одојчад; ротавирусни гастроентеритис

INTRODUCTION

Celiac crisis (CC) is a rare life-threatening complication of celiac disease (CD), which is mostly seen in the first two years of life [1-9]. It is characterized by a spontaneous or induced acutization of chronic diarrheal disorder followed by severe hydroelecrotrolytic,

acid-base and nutritive disbalance [2, 3, 4, 9-13]. Frequent precipitating factors of the disease in children involve interecurrent gastrointestinal or extraintestinal infections [1, 2]. We present three infants with CC, as an initial presentation of CD precipitated by rotavius (RV) gastroenteritis. We present three infants hospitalized over the past 15 years due to CC as an initial presentation of CD precipitated by rotavius (RV) gastroenteritis.

CASE REPORTS

Case 1

A 9-month old female infant with the data of frequent and abundant stools, loss of appetite, occasional vomiting and weight loss since age 7.5 months. Two days before admission febrile (up to 38.6^0C, rectally), does not accept meals, often vomits and received profuse watery diarrhea. On admission severely dehydrated, conspicuously malnourished, somnolent, adynamic, with cold and cyanotic acral regions, edema of the foot dorsum and lower limbs, and perianal erythema. Rectal temperature (RT) 36.1^0C, heart rate (HR) 140/min, respiration rate (RR) 42/minute and blood pressure (BP) 60/35 mmHg. Body length (BL) P 50th percentile, body weight (BW) -28%. Stool pH 5 and Clini test +++. Antibodies to tissue transglutaminase (AtTG) IgA 66.3 U/ml.

Case 2

A 10-month old male infant admitted due to severe dehydration**,** meteorism and marked malnutrition followed by generalized hypoproteinic edema. According to parents, over the previous two months he had frequent, abundant, fatty or watery and loose stools, progressive food aversion, intermittent postprandial vomiting, apathy, irritability and weight loss. Two to three days before admission he developed a sudden increase of fever, persistent vomiting and profuse watery diarrhea. On admission somnolent, adynamic, afebrile (RT 36.6^0C), HR 146/min, RR 46/min, deep, BP 55/30 min/Hg, BH P25th percentile and BW -32%. Perianal erythematous ulcer changes. Stool pH 5, Clini test +++. AtTG IgA 78 U/ml.

Case 3

A 12-month old female infant admitted a day after a sudden deterioration of one-month diarrheal disorder followed by high fever**,** vomiting, profuse watery diarrhea, severe dehydration and meteorism**.** On admission adynamic, apathetic, irritable, subfebrile (RT 37.9^{0}C), HR 148/min, RR 44/min, BP 70/40 mmHg, BH P25-50th percentile and BW -24%, edematous dorsum of feet, perianogenital erythema. Stool pH 5.5, Clini test +++. AtTG IgA 58.6 U/ml.

Nutrition, onset of CD symptoms and blood laboratory values on admission of the infants with CC are shown on Tables 1 and 2.

By the method of latex agglutination, in all three children we confirmed RV in the stool. Stool examination for pathogenic bacteria and Giardia lamblia were negative in all three patients. Cases 1 and 2 had a mild hypertransaminasemia, without hepatomegaly**,** hyperbilirubinemia and increased activity of serum creatinine-phosphatase.

After correction of dehydration and hypoalbuminemia, patients were placed on a gluten- and disaccharide-free diet and within the first 2 weeks on additional parenteral nutrition. The therapeutic measures resulted in the stabilization of the patients' condition followed by gradual recovery. Due to marked secretory diarrhea, during the first ten days the prevention of dehydration was done intravenously and during the next seven to ten days i.e. until the normalization of stool frequency, with oral rehydration solution (Orosal 65, Galenika). After 2 weeks of treatment, enterobiopsy was performed and in all three cases the stereomicroscopic and histological examination of the small intestinal mucosa showed a total villous atrophy (Marsh IIIc) (Fig. 1). Also, all three were homozygous carriers of the HLA DQ2 gene. On a gluten-free diet and a 4-month supplement of iron and multivitamin preparations, all three patients completely recovered.

These case reports were approved by the institutional ethics committee, and written consent was obtained from the patients' parent(s)/guardian(s) for the publication of the reports and any accompanying images.

DISCUSSION

We report three infants with CC as the initial presentation of CD precipitated by RV gastroenteritis. In all three cases CC was preceded by disturbances which evidently indicated the classical form of CD that was not recognized on time, while 1-2 days before admission the infants developed the typical signs of RV gastroenteritis: increased fever, frequent vomiting and profuse watery diarrhea, i.e. osmotic-secretory diarrhea [1, 14]. All three children were shortly breast fed and two were to early exposed to gluten, which, in the presence of genetic predisposition, led to early expression of CD [15-18]. On the other hand, as Serbian children are not vaccinated against rotavirus**,** RV infection occurred at age 9-12 months, i.e. in the period of the loss of prenatally acquired passive immunity, which, associated with the absence of maternal milk protective effect, added to the development of a severe clinical form of infective enteritis [14, 19-23]. The common characteristic of both diseases was that the inflammatory changes of the small bowel mucosa were most expressed in the proximal portion of the small bowel, i.e. in the segment that plays the central role in the processes of food digestion and absorption [1, 14]. The joint action of two different types of inflammation, autoimmune and infective, resulted in the severe damage of the small bowel mucosa followed by the reduction of its functional surface and epithelial immaturity [24, 25]. Therefore, the initial diarrheal disorder in association with CD complicated by RV gastroenteritis suddenly resumed a severe clinical course to enter all three infants into CC. By the correction of hydroelectrolytic and acid-base disbalance, albumin deficit compensation, as well as gluten and disaccharide-free diet, the condition of the patients stabilized. However, due to the prolonged secretory diarrhea and poor nutritional state, all three patients required a 10-day intravenous hydroelectrolytic and a 2-week parenteral nutritional support. Three weeks of treatment resulted in disaccharide tolerance, so that gluten-free diet was sufficient to achieve full recovery.

In conclusion, RV gastroenteritis and CD are characterized by identical localization of the small intestinal damage. Thus, this infection in infants with timely unrecognized classical CD can lead to CC.

Conflict of interest: None declared.

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Table 1. Nutrition and onset of first celiac disease (CD) symptoms in infants with celiac crisis

Case	Duration of breast feeding (months)	Age at gluten introduction (months)	Age at onset of CD symptoms (months)
1	1	3.5	7.5
2	1.5	3	8
3	0.25	4	11

Table 2. Blood laboratory values on admission

Case	Sodium (mmol/l)	Potassium (mmol/l)	pH*	Creatinin (μmol/l)	Calcium (mmol/l)	Magnesium (mmol/l)	Phosphate (mmol/l)	Albumin (g/l)	Hb (g/l)
1	129	2.8	7.24	101	1.96	0.66	0.79	22	98
2	122	2.4	7.21	108	1.79	0.63	0.64	18	84
3	130	2.9	7.26	98	1.98	0.67	0.76	24	79

*Capillary blood

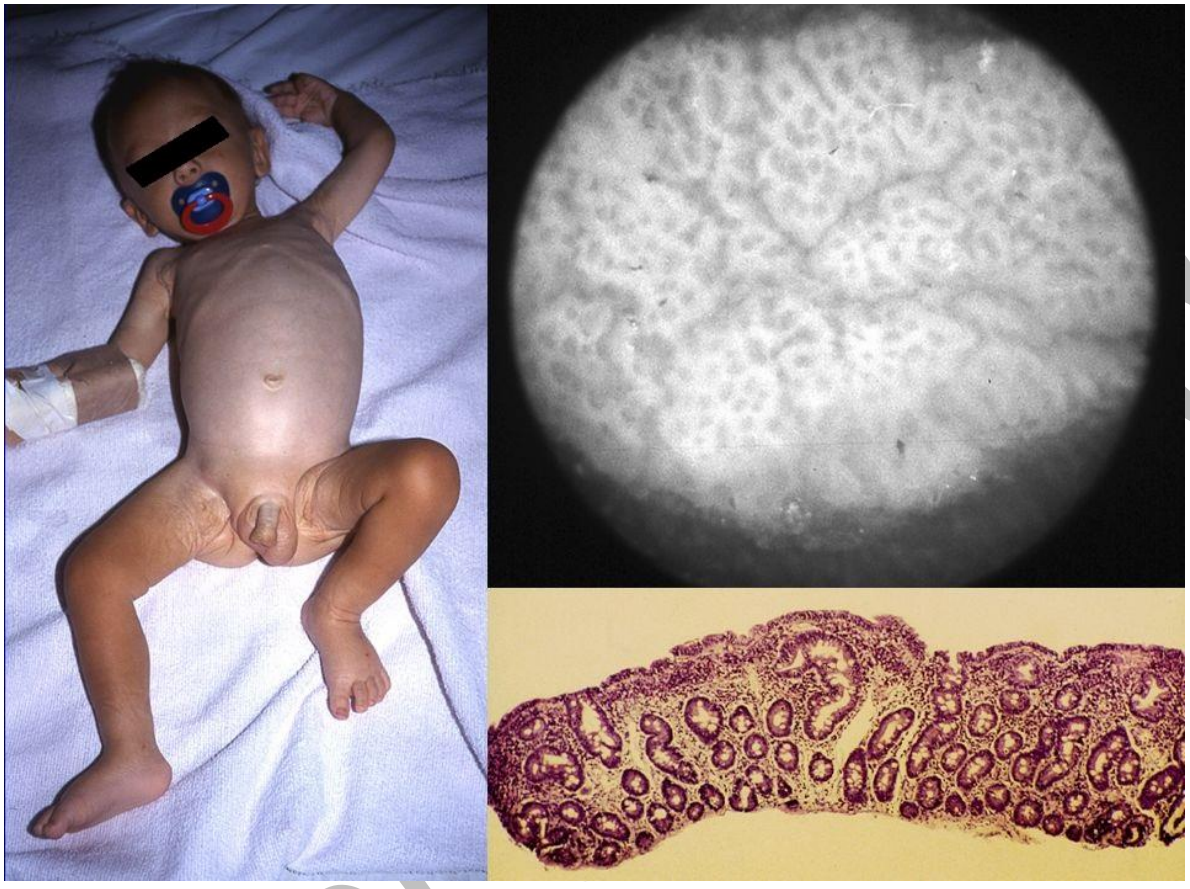

Figure 1. Male patient in the initial phase of recovery and stereomicroscopic and histological appearance of the patient's small intestinal mucosa

