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Original research article/Artykuł oryginalny

## Intussusception as a complication of rotavirus infection in children



### Wgłobienie jako powikłanie zakażenia rotawirusowego u dzieci

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#### ARTICLE INFO

##### Article history:

Received: 11.07.2015

Accepted: 25.08.2015

Available online: 03.09.2015

##### Keywords:

- Intussusceptions
- Rotavirus infection
- Complication

#### ABSTRACT

Complications in the form of intestinal intussusception and *pneumatosis intestinalis* are one of the factors constituting the severity of RV infection. Intestinal intussusception is the most common form of intestinal obstruction in children. **The aim** of this study was to discuss and analyze the clinical course of cases of acute rotavirus infection complicated by intussusception and/or *pneumatosis intestinalis*. **Materials and method:** The retrospective analysis included data of 613 patients with acute gastroenteritis, hospitalized in the Gastroenterology Unit of Department of Pediatrics of the Medical University of Silesia in Katowice in 2013. Rotavirus etiology was confirmed in 276 (45%) cases. **Results:** Complications in the form of intussusception and/or pneumatosis were found in 5 (1.8%) children (among them were 3 girls and 2 boys) aged from 2.5 to 7.5 years, with severe RV infection. Moreover, in one case, in 9-year-old boy, infection with rotaviral and adenoviral etiology was observed. The study included a detailed history from carers, including in particular the type of symptoms, the period in which the described symptoms occurred, concomitant diseases, the history of diseases, and optionally current treatment. **Conclusion:** Although, the diarrhea is generally self-limiting mild disease, its course should be monitored, not only because of the problem of dehydration and electrolyte imbalance but also because of the possibility of complications in the form of intussusception and/or *pneumatosis intestinalis*.

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<http://dx.doi.org/10.1016/j.pepo.2015.08.004>

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## Introduction

Acute diarrhea is a common disease among infants and children. Currently, major etiological agents of acute diarrhea in children are viral infection. According to estimates, rotaviruses (RV) are responsible for up to 50% of acute infections of the gastrointestinal tract [1, 2]. Acute gastroenteritis can be also caused by adenovirus (type 40 and 41), norovirus, sapovirus, astrovirus. However, cases of children with bacterial infection (*Salmonella*, *Shigella*, *Campylobacter* and enteropathogenic *E. coli*) can be found less often.

Centers for Disease Control and Prevention (CDC) report that in the world annually RV cause close to 111 million episodes of gastrointestinal infections treated at home, 25 million outpatient visits, 2 million hospitalizations (mainly due to the rapid course of diarrhea and dehydration) and from 352 thousand to 592 thousand deaths in children under 5 years old, wherein the deaths occur primarily in developing countries (440 thousand of deaths per year, while in the European Union about 230) [3]. Children under 5 years of age are more likely to be infected (particularly between 6 months and 2 year of age) [2, 4, 5]. The heaviest course of acute diarrhea is observed in the neonatal and infancy period, where it is easy to disturb homeostasis due to the functional immaturity of the organism. RV infection is also one of the most common etiological factors of nosocomial infections. In Poland in 2009 20 689 cases of RV infections were registered in pediatric departments. Results of numerous studies show large-scale problem of RV infection in the pediatric population [1, 2, 4].

The clinical picture of infection is very varied, in some patients, the disease is mild (also possible is asymptomatic or nonspecific course), it can also lead to dehydration (80%) metabolic disturbances, organ failure requiring hospitalization and parenteral rehydration [6]. There are also described cases of very severe course of infection, with a necrotic or hemorrhagic colitis character, which can lead to the death of the child [7]. The pancreatitis, encephalitis, cerebellum infection, urinary tract nephrolithiasis leading to prerenal renal failure also occurred [8-10]. Further explanation requires the participation of RV in the pathogenesis of diseases such as: Reye's syndrome, obstructive cholangitis, coagulation disorders, or sudden infant death syndrome (SIDS) [11-15].

Complications in the form of intestinal intussusception (ISS) and *pneumatosis intestinalis* are one of the factors constituting the severity of RV infection. Intestinal intussusception is the most common form of intestinal obstruction in children. Usually, the cause is unknown, but in some cases coexisting infection of respiratory and gastrointestinal tract, including RV- and adenovirus-induced, can be observed [16]. *Pneumatosis intestinalis* is a rare radiological symptom, characterized by the presence of multiple cysts, filled with gas in the gastrointestinal wall. The secondary form is dominant (85%) and normally occurs in the course of other diseases, not only in the course of the gastrointestinal tract diseases. The etiology of this disease is unknown. In the literature you can find descriptions of intussusception cases with *pneumatosis intestinalis* etiology, which is the so-called "lead point" [17, 18].

While the potential link between infection caused by rotavirus and intussusception is the subject of numerous considerations, further study is needed to assess the risk of these complications in the course of infection caused by other common factors (e.g. adenovirus) in this age group (Fig. 1).

## Aim of the study

The aim of this study was to discuss and analyze the clinical course of cases of acute rotavirus infection complicated by intussusception and/or *pneumatosis intestinalis*.

## Materials and method

The retrospective analysis included data of 613 patients with acute gastroenteritis, hospitalized in the Gastroenterology Unit of Department of Pediatrics of the Medical University of Silesia in Katowice in 2013. Rotavirus etiology was confirmed in 276 (45%) cases. Complications in the form of intussusception and/or *pneumatosis intestinalis* were found in 5 (1.8%) children (among them were 3 girls and 2 boys) aged from 2.5 to 9 years, with severe RV infection (Table 1). Moreover, in one case, in 9-year-old boy, infection with rotaviral and adenoviral etiology was observed. The study included a detailed history from carers, including in particular the type of symptoms, the period in which the described

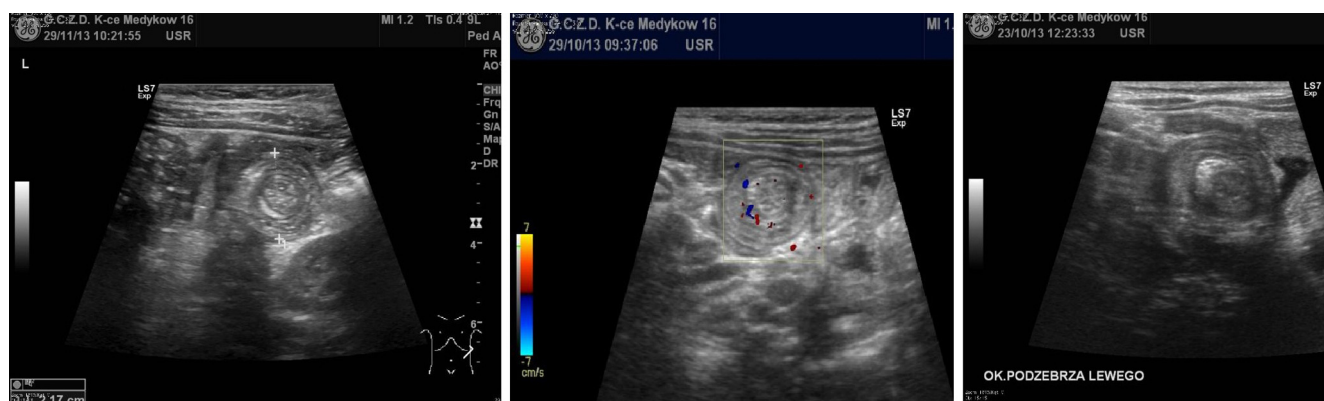


Fig. 1 – Intussusception of small intestine in examined patients (USG examination)

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