

Parents' knowledge and attitudes about adenovirus enteritis of children

Parents' knowledge about adenovirus in children

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Abstract

Aim: This study aimed to examine the effect of the sociodemographic characteristics of the parents of children hospitalized for adenovirus enteritis and child care attitudes of parents on the course of adenovirus enteritis.

Material and Methods: A total of 57 patients aged <6 years who were hospitalized for adenovirus enteritis were included in the study. A questionnaire was administered to the parents to gather data on the patients' birth history, chronic diseases, and breastfeeding times, and parents' level of education and knowledge about adenovirus enteritis and dehydration. The questionnaire also included items about hygiene measures for dehydration. Kidney function tests, electrolyte values, and blood gas analysis were performed to evaluate the dehydration status of the patients objectively.

Results: Of 57 patients, their mean age was 19.84 ± 14.97 months. The mean number of patients' siblings was 1.76 ± 0.76 . 10.5% of parents had knowledge about adenovirus-related diarrhea. Parents believed that adenoviruses were transmitted through contaminated water (45.6%), food (17.5%), and surface (19.3%) and through human-to-human contact (17.5%). A significant relationship was found between parental education level and knowledge of diarrhea caused by an adenovirus ($p = 0.032$). In addition, a significant relationship was noted between parental education level and hand washing after each diaper change ($p = 0.016$). Moreover, no significant difference was found between the duration of breastfeeding and the time to initiation of oral intake after diarrhea ($p = 0.501$).

Discussion: It was thought that having a large family, education level, working status of parents were factors that influence the course of adenovirus and the development of dehydration that would require hospitalization. We believe that families' knowledge of adenovirus infection and possible complications will help in preventing irreversible morbidities. Therefore, adenovirus infections need to be included in informative speeches in the field of preventive medicine.

Keywords

Adenovirus, Gastroenteritis, Child

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Introduction

Human adenoviruses are a group of double-stranded membraneless deoxyribonucleic acid viruses belonging to the Adenoviridae family [1]. Known transmission routes are aerosol particulate or droplets, hand-ocular, fecal-oral, and fecal (fomites) [2]. More than 80% of adenovirus infections occur in children aged <4 years because of humoral immunity deficiency[3,4].

Different adenovirus genotypes may cause diverse clinical findings and various diseases such as acute respiratory disease, acute gastroenteritis, keratoconjunctivitis, hemorrhagic cystitis, hepatitis, hemorrhagic colitis, pancreatitis, nephritis, and meningoencephalitis [5]. Human adenovirus, which includes serotypes 40 and 41, is associated with F gastroenteritis and is therefore called enteric adenovirus [6,7]. Vomiting and diarrhea-related fluid loss that develops in enteritis can increase the circulating blood volume and then lead to dehydration and electrolyte imbalance [7]. Poor hygienic conditions, inadequate access to clean drinking water, and insufficient sanitation increase the risk of disease transmission [8, 9]. Studies examining the parents' knowledge of children with adenovirus enteritis about the disease and what families should do in approaching the disease are limited in the literature.

This study aimed to examine the effect of the knowledge level of the parents about the disease of their young children hospitalized for adenovirus enteritis, sociodemographic characteristics of the patients and parents, and child care attitudes of the parents on the course of adenovirus enteritis.

Material and Methods

This cross-sectional study included 57 children aged <6 years who were hospitalized in the pediatric ward of our hospital with the diagnosis of adenovirus gastroenteritis between April 2020 and October 2020. The patients aged 0-6 years who had adenovirus gastroenteritis and who developed nutritional intolerance due to enteritis were included in the study. Those aged >6 years old, those who used antibiotics in the last 15 days, and those with chronic gastrointestinal system disease were excluded from the study.

A questionnaire was administered to the parents to collect data about their children's birth history, chronic diseases, and breastfeeding times, and parents' level of education and level of knowledge about adenovirus enteritis and dehydration. This questionnaire also included items about hygiene measures for dehydration. Parents' education level, profession, and working status were recorded. Symptoms such as upper respiratory tract infection or keratoconjunctivitis accompanying adenovirus enteritis were recorded, if any. Children with adenovirus enteritis were evaluated for the presence of clinical and physical examination findings of dehydration. Kidney function tests, electrolyte values (sodium, potassium), and blood gas analysis were performed to evaluate the dehydration status of the patients objectively. The data has been collected systematic and comprehensive manner.

Voluntary informed consent was obtained from the parents. Approval was obtained from Niğde Ömer Halisdemir University Clinical Research Ethics Committee (approval number. 38497978-645-E.13951, dated March 10, 2020).

The student's t-test was used for the analysis of data that showed normal distribution among independent groups. The Mann-Whitney U test was used for variables that did not show a normal distribution. The chi-square test was used to analyze categorical variables. Analysis of the data was carried out with the SPSS (version 24) software package. P <0.05 was considered significant.

Results

In total, 57 pediatric patients were included in the study. Of these patients, 17 were girls and 40 were boys. The mean age of the patients was 19.84 ± 14.97 months. The mean number of patients' siblings was 1.76 ± 0.76. In addition, 41.5% of the patients had one sibling, 43.9% had two siblings, 12.2% had three siblings, and 2.4% had four or more siblings. The mean birth weight of the patients was 3040 ± 550.94 grams. Other sociodemographic characteristics of the patient and parents are shown in Table 1.

In this study, 66.7% of the parents had the habit of washing their hands before preparing complementary food for the child and 33.3% did not. In addition, 63.2% of the parents used

Table 1. Sociodemographical characteristics of parents and patients

	n	%
Gender		
Female	17	29.8
Male	40	70.2
Delivery time		
Term	52	91.2
Preterm	5	8.8
Chronic disease		
Yes	9	15.8
No	48	84.2
Time of mother milk		
0-6 month	21	36.8
6-12 month	16	28.1
>12 month	20	25.1
Parent working		
Yes	17	29.8
No	40	70.2
Parent's job		
Self-employment	9	15.8
Worker	6	10.5
Housewife	42	73.7
Living place		
Village	27	47.4
City	30	52.6

Table 2. The Relationship Between Various Situations in Parents and the Time of Initiation of Feeding

	n (day)	t	p
Those who do not wash hands before preparing complementary food	3	1,82	0,002
Those who do not wash their hands after changing their diapers	3	-1,98	0,048
Those with poor self-care by the caregiver	3	-2,89	0,004
Those whose parents do not work	4	1,24	0,412

to wash their hands after every diaper change, 10.5% had knowledge about adenovirus-related diarrhea, and 89.5% did not have knowledge about it. Parents believed that adenoviruses were transmitted through contaminated water (45.6%), food (17.5%), and surface (19.3%) and through human-to-human contact (17.5%). Moreover, 17 children were previously hospitalized for diarrhea; 35.1% of the patients were brought to the hospital because of vomiting, 45.6% of diarrhea, 14% of fever, and 5.3% of being unable to feed. Dehydration symptoms developed in 70.2% of the patients before hospitalization, and 22.8% received treatment for bicarbonate deficit, 26.3% had impaired renal function tests, and 31.6% had upper respiratory tract infection and diarrhea. Keratoconjunctivitis and diarrhea were found in 24.6% of the patients.

Of the parents, 71.9% thought that probiotic supplementation reduced the number and frequency of diarrhea, and 42.1% thought that zinc treatment improved the patient's diet. After the onset of diarrhea, 12.3% of the patients started oral intake on the first day, 36.8% started on the second day, 36.8% started on the third day, and 19.3% started on the fourth day and beyond.

In this study, a significant relationship was found between parents' education level and their knowledge of diarrhea due to adenovirus ($p = 0.032$). Moreover, parents who were secondary school graduates (50%), high school graduates (33.3%), and university graduates (16.7%) had knowledge about adenovirus diarrhea, and none of the parents who were primary school graduates had heard of adenovirus-related diarrhea. As regards the relationship of parental education level and profession with hand hygiene, no relationship was found between parental profession and hand washing after each diaper change ($p = 0.148$). However, a significant relationship was noted between parental education level and hand washing after each diaper change ($p = 0.016$). 71.4% of those who did not wash their hands after changing diapers were primary school graduates, 19% were high school graduates, and 9.5% were secondary school graduates. A significant relationship was found between parental education level and hand washing before preparing complementary food ($p = 0.049$). 68.2% of those who did not wash hands are primary school graduates, 19.8% are secondary school graduates, 11% are high school graduates, and 12% was a university graduate. No significant difference was found between children with employed parents and those with unemployed parents with respect to time to initiation of oral intake ($p = 0.412$). In this study, no significant relationship was found between the duration of breastfeeding and the development of signs of dehydration ($p = 0.715$) and measuring bicarbonate deficit ($p = 0.348$). No significant relationship was observed between the duration of breastfeeding and the development of upper respiratory tract infection symptoms and diarrhea ($p = 0.174$). In addition, no significant difference was found between the duration of breastfeeding (<6 months, 6–12 months, and >12 months) with respect to the initiation of oral intake after diarrhea ($p = 0.501$). The effects of various situations on time to initiation of oral intake after diarrhea are shown in Table 2.

Discussion

Knowledge of parents about hand disinfection, hand washing, diaper change, and disease transmission significantly was found to remarkably reduce the transmission rates of organism-causing diarrhea. These measures should be continued for a long time because the pathogen continues to be excreted even after the disappearance of symptoms [10]. In the present study, the higher the parents' education level, the higher the rate of hand washing before complementary food preparation and after the diaper change. The rate of those who did not wash their hands before preparing complementary food was also high among those with a low education level.

John Moyo et al. stated that parent's education level is 75% primary education, 16.7% secondary education, 8.2% higher education respectively in their study [11]. They detected that the majority of adenovirus-infected diarrhoeic children were dehydrated [11]. Dey et al. stated that adenovirus infection causes severe gastroenteritis and dehydration [12]. In this present study, the parent of children with adenovirus enteritis has higher school graduates, and 70.2% of the patients had dehydration symptoms. The findings concur with the results from the literature.

Motamedifar et al. stated that diarrhea is the most common symptom in adenovirus enteritis, and fever is the second common symptom [13]. In the present study, diarrhea (45.6%) and vomiting (35.1%), respectively, are the most common causes of hospital admission in children with adenovirus enteritis. The fact that the frequency of enteritis symptoms in our study was not similar to the study of Motamedifar et al. was thought to be related to the low number of patients.

Awareness of the modes of transmission of adenovirus enteritis may affect the parents' approach to the disease and the precautions they should take. Napolitano et al. found that less than half of the parents knew about enteritis. Of these parents, 60.8% believed that the pathogen is transmitted through contaminated water, 56% through contaminated foods, 38% through contaminated surfaces, and 36% through human-to-human contact [14]. In the present study, parents know that adenovirus enteritis is most often transmitted by contaminated water, followed by contaminated surface, contaminated food, and human-to-human contact, in this order. In the present study, the knowledge levels of the parents about the transmission routes were similar to those in the literature.

A study conducted in Australia revealed that viral enteritis was among the most common causes of diarrhea in children aged <5 years in developing countries [15]. Moreover, household economic status is significantly associated with the prevalence of diarrhea, especially in low-income countries [16]. In the present study, 70.2% of the parents were unemployed, 47.4% of the patients lived in the village, and 53.6% lived in the city, and the percentage of those with ≥ 2 siblings was higher than those with one sibling. These findings suggest that the low economic situation in the family and living in a crowded home may increase the incidence of enteritis.

In a study conducted in Italy, family physicians increased the awareness of families by informing them about rotavirus enteritis or by recommending rotavirus vaccination. With the

influence of social media and other information sources on vaccination, parents have better understood the importance of both rotavirus enteritis and vaccination [17]. The lack of vaccine against adenovirus is the reason why this issue is not included in child informative speeches of health professionals in preventive medicine and in written and visual communication channels. Adenovirus infections may cause keratoconjunctivitis during their course [18]. Keratoconjunctivitis has an epidemic course and causes permanent scar formation in the cornea and morbidity in the form of decreased visual acuity [19]. In our study, 10.5% of the parents had knowledge about adenovirus enteritis. If parents are informed about adenovirus infection, they may recognize clinical findings early and prevent dehydration. In this way, keratoconjunctivitis will be prevented, and early admission to eye clinics will be arranged, if necessary. In addition, early and effective measures will be taken to prevent intrafamilial spread of adenoviral conjunctivitis, which is highly contagious by contact.

Not breastfeeding affects the incidence and prevalence of acute infectious gastroenteritis in developed or developing countries [20]. In the present study, no significant relationship was observed between the duration of breastfeeding and the development of signs of dehydration, and the time to initiation of oral intake after diarrhea. The finding that the duration of breastfeeding did not affect the symptoms and response time to treatment may be due to the low number of patients included in the study. This situation constitutes the limitation of the study.

Conclusion

It was thought that the education level and the working status of the parents and having a large family are factors that effectively affect the course of adenovirus infection and the development of dehydration that would require hospitalization. We believe that families' knowledge about adenovirus infection and possible complications will be helpful in preventing irreversible morbidities. It is important to include adenovirus infections in informative speeches in the field of preventive medicine.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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