International Journal of Children and Adolescents

Original Article
IJCA, Vol. 2, No. 2, Apr, 2016.17-20.

Association between paraffin leakage and occurrence or exacerbation of urinary tract infection in children with chronic functional constipation

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Received: 23 Nov 2015 Accepted: 11 Feb 2016

Abstract

Background and Objective: Given the widespread use of paraffin in the treatment of constipation in children and the possibility of long duration of drug use and the risk of drug leakage, the risk of urinary infection in these patients is considerable. The aim of this study was to determine the association between leakage of paraffin and the presence or exacerbation of the urinary infection and repeated attacks of urinary tract infection in children with chronic functional constipation.

Methods: In this cohort study, 80 consecutive children aged 3 to 17 with the diagnosis of chronic constipation according to the Rome III criteria that received paraffin (5 to 15ml/kg/day) or polyethylene glycol (1.5grams/kg/day) treatment schedule were studied and the presence of urinary tract infection in the patients was analyzed.

Results: There was also no difference between paraffin group and polyethylene glycol group in terms of the prevalence of urine incontinence (17.5% versus 25.0%, p=0.293) and fecal incontinence (17.5% versus 12.1%, p=0.378). In total, positive urinary culture was found in one child (2.5%) in paraffin group and in two children (5.0%) in polyethylene glycol group without significant difference (p=0.500).

Conclusion: The occurrence of urinary tract infection is expected in 3.75% of children with chronic functional constipation treated with paraffin or polyethylene glycol. The types of treatment including paraffin or polyethylene glycol do not increase the risk for urinary tract infection in these children.

Keywords: Paraffin leakage, Urinary tract infection, Constipation

Introduction

Functional constipation is frequently the result of withholding of feces in the absence of an organic or biochemical etiology. The affected children may also experience encopresis as recurrent episodes of fecal incontinence due to fecal impaction (1). Functional constipation accounts for about one-fourth of pediatrics-related clinical problems and also is one of the 10 most common diagnoses by general pediatricians and has been identified as a major cause of both emotional and economic burden (2,3). The true prevalence of the disease based on the criteria used in the definition of constipation is estimated to be 1% to 30% percent and the highest prevalence can be shown in preschool group, while the gender factor is ineffective (4). Although this disease is very common with a wide range of clinical symptoms, the physician are responsible for finding organic cause of disease in patients. In most cases, functional causes of chronic constipation can be easily discovered. For all patients with functional chronic constipation timely and proper medical intervention is binding so delay in treatment may deteriorate physical and

mental complications (5,6). The main goal of treatment is to achieve a soft bowel movement once a day that achieving this result requires months or even years of treatment with laxative and along with behavior therapy. Concomitant use of medication and behavior therapy has been considered for these patients since 1960 and extensive studies have been evaluated and approved the treatment approach (7,8). Laxative medications used to treat chronic constipation can be a stool softener medication groups, bulking agents, osmotic agents, and lubricants stimulating bowel movements. All types of drugs can have adverse effects, but the side effect of drug leakage may be found by paraffin (9,10). Given the widespread use of paraffin in the treatment of constipation in children and the possibility of long duration of drug use and the risk of drug leakage, the risk of urinary infection in these patients is considerable. Unfortunately, very little research has been done in this field. The aim of this study was to determine the association between leakage of paraffin and the presence or exacerbation of the urinary infection and repeated attacks of urinary tract infection in children with functional chronic constipation.

Methods

This prospective cohort study was performed on 80 consecutive children aged 3 to 17 and diagnosed as chronic constipation according to the Rome III criteria who referred to gastroenterology and nephrology clinics at Rasool Akram Hospital and Ali Asghar Children's Hospital in Tehran in 2014. The inclusion criteria were the lack of urinary infection or absence of fecal incontinence on admission identified by negative urinary analysis and urinary culture. The patients were assigned to treat with paraffin or polyethylene glycol for six months and checked for urinary tract infection monthly. In fact, those patients with chronic constipation who had inclusion criteria and received paraffin (5 to 15 ml/kg/day) or polyethylene glycol (1.5 grams/ kg/day) treatment schedule were studied and the presence of urinary tract infection in the patients was analyzed. In this study, urinary tract infection was defined as growth of more than 100,000 colony-forming units/mL of one microorganism in cultured urine collected aseptically from mid-stream urine sample.

Results were presented as mean ± standard deviation (SD) for quantitative variables and were summarized by absolute frequencies and percentages for categorical variables. Categorical variables were compared using chi-square test or Fisher's exact test when more than 20% of cells with expected count of less than 5 were observed. Quantitative variables were also compared with Mann- Whitney U test. Statistical significance was determined as a $p \leq 0.05$. All statistical analyses were performed using SPSS software (version 19.0, SPSS Inc., Chicago, Illinois).

Results

In total, 80 children with chronic functional constipation were categorized as the paraffin group (n=40) or polyethylene glycol group (n=40). The mean age of children in paraffin group was 56.45±19.76 months and in polyethylene glycol group was 65.47 ± 39.88 months with no difference (p=0.203). Regarding gender distribution, in paraffin group, 50% were male, while in polyethylene glycol group, 42.5% were male (p=0.327). Thus, the two groups were matched for gender and age variables. The mean duration of constipation in the children who treated with paraffin and polyethylene glycol was 10.0±10.14 months and 13.45±20.10 months respectively with no difference (p=0.335). There was also no difference between paraffin group and polyethylene glycol group in terms of the prevalence of urine incontinence (17.5% versus 25.0%, p=0.293) and fecal incontinence (17.5% versus 12.1%, p=0.378). With respect to underlying disorders, one of the children who received paraffin suffered valvular heart stenosis and 2 others had history of celiac disease, while, among those who received polyethylene glycol, one child had history of celiac disease, one child had history of autism, and another one had fissure. No difference was revealed in underlying disorders between the two groups (p=0.504). In

Table 1. Baseline characteristics of study population

Variable	Paraffin group (n = 40)	polyethylene glycol group (n = 40)	p
Mean age (month)	56.45 ± 19.76	65.47 ± 39.88	0.203
Male gender (%)	50.0	42.5	0.327
Mean duration of constipation (%)	10.0 ± 10.14	13.45 ± 20.10	0.335
Prevalence of urine incontinence (%)	17.5	25.0	0.293
Prevalence of fecal incontinence (%)	17.5	12.1	0.378
History of celiac disease (%)	5.0	2.5	0.504

total, positive urinary culture was found in one child (2.5%) in paraffin group and in two children (5.0%) in polyethylene glycol group without significant difference (p=0.500). Assessing those children with positive urine culture, all three affected children were female, two of them had urine incontinence and another one had fecal incontinence.

Discussion

Chronic constipation is a common problem within childhood. According to exclusive use of paraffin in treatment of chronic constipation and also increased risk for oil leakage cause by this treatment approach affecting health of perinea region, the risk for urinary tract infection may be significantly increased following treatment of constipation in children. In the present study, we first assess the prevalence of urinary tract infection in treated patients with chronic constipation and then we assess the consequences of the two anti-constipation treatment protocols in these subjects. In first phase, we showed an overall prevalence of 3.75% for urinary tract infection in children with chronic constipation that was independent to the type of treatment protocol including paraffin or polyethylene glycol. In fact, the treatment method could not be associated with the increased risk for urinary infection. However, the risk for urinary tract infection was significantly more in female children. In a study by Loening-Baucke (11), the frequency of urinary tract infection in 234 chronic constipated and encopretic children before, and at least 12 months after, the start of treatment for constipation was assessed and showed the occurrence of urinary infection in 11% of children that was more commonly present in girls (33.0%) than in boys (3%) that was overall higher than that observed in our survey. In a study by Dehghani et al (12), 5.8 % of children had a positive urine culture, of that all were girls. Also, urinary symptoms, especially nocturnal enuresis, were found in a significant number of children who had chronic functional constipation, but UTI was not so common in the present study. In both pointed studies, the prevalence of urinary infection secondary to chronic constipation was higher than that achieved in our study indicating more successfulness of our protocols in preventing urinary tract infection as a complication of chronic constipation within childhood.

The use of paraffin in treatment of chronic functional constipation has a wide application and thus its probable side effects have been more focused by clinicians (13). Sharif et al (14) indicated that the efficacy and tolerability of paraffin was higher than polyethylene glycol, however some other studies have emphasized other solutions with higher effectiveness and lower side effects for treating chronic complications (15,16). We showed that none of the two studied drugs had a triggering role in increasing risk for urinary tract infection. However, to the best of our knowledge, no published study could be found on risky behavior of paraffin or polyethylene glycol to increase risk for urinary tract infection. According to low incidence of urinary tract infection in children who suffer chronic constipation and treated with paraffin or polyethylene glycol, further studies should be performed by employing larger sample size especially as clinical trials to assess the clinically effectiveness of these drugs and to achieve optimal treatment effects and minimize related side effects.

Conflicts of interest: None declared.

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