Cell, Gene and Therapy

Review Article

Efficacy of zinc sulfate on common cold in children aged 1-5 years admitted at Javaheri hospital in Tehran

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Abstract

Introduction: Common cold is the most common acute upper respiratory tract disease in children. The efficacy of vitamins and minerals for duration, symptoms and complications of common cold has been evaluated in several studies. This study was performed to determine the efficacy of zinc sulfate on common cold in children aged 1-5 years attending to Javaheri hospital in 2012-2013.

Materials and Methods: In this clinical trial study, 112 children with common cold aged 1 to 5 years who were admitted at Javaheri hospital in 2012-2013 were enrolled. They were randomly assigned to receive either conventional treatment including Acetaminophen, Pediatric cold and nasal drop as control group or the aforementioned drugs plus zinc sulfate 1 mg/kg/day for 5 days. The duration of symptoms and rate of complications were compared between two groups.

Results: The results revealed that the duration of disease was significantly shorter in case group (P = 0.033). Also the frequency of nasal discharge, sneezing, cough and sinusitis was significantly less in case group (P<0.05).

Conclusion: In summary, it can be concluded that zinc sulfate is effective in reducing the symptoms, duration and complications of common cold in children aged from 1-5 years within 24 hours of the disease onset. **Cell, Gene and Therapy, Vol.1, Number 2, summer 2020; 96-100**

Keywords: Zinc sulfate, Common cold, Children, Complications

Introduction

Common cold is an acute viral infection of the respiratory tract. Symptoms include sneezing, nasal congestion, nasal discharge, sore throat, cough, mild fever, headache and weakness. Various viruses may cause the disease, the most common being the Rhinoviruses. The disease is usually mild and self-limiting; symptoms peak within 2-3 days of onset and recovery occurs in infants and young children within 10-14 days, while in older children and adults it takes 5-7 days. Deterioration or persistence of the symptoms indicates the start of complications[1]. Means of palliative care include getting adequate hot fluids, chicken soup, nose cleaning, nose rinse with normal saline and appliance of humidifiers. Symptomatic treatments such as antihistamines, decongestants, cough suppressants and mucoactive drugs have no

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Table 1. the duration of common cold in the group receiving zinc sulfate VS the control group

Group	Duration of symptoms			Total
	Less than 5 days	5-7 days	More than 7 days	
Case	12(21.4%)	25(44.6%)	19(33.9%)	56(100%)
Control	25(44.6%)	17(30.4%)	14(25%)	56(100%)

effect on disease progression and sometimes cause complications in patients[2,3]. Antibiotics are only recommended if infectious complications are added. Other treatments include vitamin C, Common Chicory and Zinc[4,5].

Zink is an essential trace mineral whose deficiency in the body causes developmental disorders, hypogonadism, skin diseases, olfactory and taste disorders, immunodeficiency and decreased resistance to infections. In vitro studies have shown that zinc inhibits the proliferation of rhinoviruses; therefore, it has been used to treat colds[6]. In numerous studies in children, the effect of zinc on reducing the duration and severity of symptoms of colds is unclear and side effects like nausea and bad taste, are common[7,10].

The purpose of this study was to evaluate the efficacy of zinc on colds in children aged 1-5 years who admitted at Javaheri Hospital in 2012-2013.

Materials and Methods

This clinical trial study was performed on 112 children with colds admitted at Javaheri Hospital in 2012-2013. Children aged 1–5 years who had been admitted at the clinic at the onset of the cold (day 1 of the illness) and had no history of underlying disease, heart and pulmonary diseases, asthma, and abnormalities and were not on medication and had normal development were included. The children were randomly divided into groups of 56, one received common cold treatment including acetaminophen, cold syrup, and nasal drops, and the other had routine treatment with zinc sulfate syrup at a dose of 1 mg / kg per day for 5 days.

The two groups were compared in terms of duration of the disease, clinical symptoms and incidence of complications. The gathered data were put in the questionnaire that was prepared for this purpose. Data were analyzed using SPSS 13 software and Chi-square and Fisher's exact tests. P value was less than 0.05.

Results

Out of 112 children (57.1%), 64 were male and 48 (42.9%) were female. There was no statistically significant difference between the two groups in terms of gender (P = 0.7). In terms of age (39.2%), 44 cases were 1-2 years, 58.8% (58.8%) were 2-3 years old and 8.9% (10.5%) were 3-5 years old. There was no significant difference in age distribution between the two groups (P = 0.9).

Chi-square test showed that the duration of disease in the group receiving zinc sulfate was significantly (P = 0.03) shorter than the control group (Table 1).

After 5 days, symptoms and complications was compared between the two groups. The prevalence of nasal discharge in the case group (46.4%) was 26 and in the control group (75%) was 42. This difference was statistically significant (P = 0.002). Prevalence of fever, headache, sore throat, voice hoarse and weakness in case group was lower than control group but this difference was not statistically significant (P <0.05). The rate of cough in the case group (82.1%) was 46 and in the control group (98.2%) was 55 which showed a significant difference (P = 0.004). 13

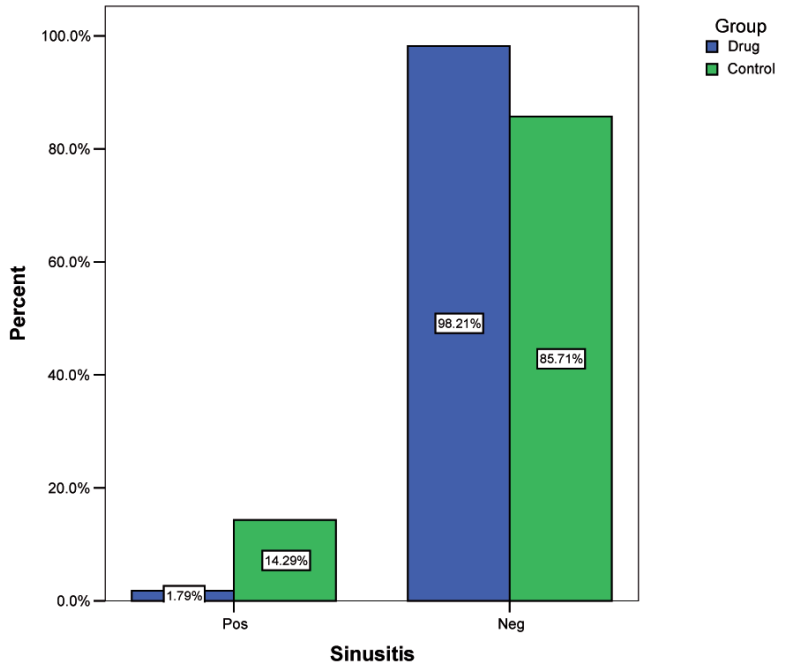

Fig 1. The frequency of sinusitis in treatment and untreated children with common colds groups

patients (23.2%) in the case group and 36.3% (64.3%) in the control group had sneezing, which was statistically significant (P = 0.0001). Incidence of sinusitis and need for antibiotics in case group (1.8%) was 1 person and in control group (14.3%) was 8, which was significant (P = 0.03) (Fig 1).

The rate of otitis media in case group (1.8%) was 1 person and in control group (12.5%) was 7 persons.

Discussion

According on the results of this study, administration of zinc sulfate during colds in 1-5 year old children reduces the duration of the disease, the severity of clinical symptoms, and the complications including sinusitis and otitis and there is less need for antibiotics in this group.

Several systematic review studies have shown that zinc administration in colds shortens the duration of the disease, but there are significant differences in each case[11,12]. These differences have made the effect of zinc use on children colds unclear.

A systematic review study of 8 studies in 2012, involving 934 patients, including 371 adults and 563 children, showed a reduction in the duration of symptoms but with subgroup analysis, it was found that zinc was effective in reducing the symptoms and duration in adults but not in children[12]. A 2014 study by Das and Singh found that if zinc started within the first 24 hours of the onset of cold symptoms, it would shorten the duration of the disease but did not affect the severity of the symptoms, while the prevalence of side effects was high[4,11]. In the Mossad et al. study, the overall improvement in symptoms was marked by zinc intake and a significantly lower number of days with cough, headache, hoarseness, nasal congestion, nasal discharge, and sore throat, but side effects such as nausea and bad taste had become worse[13]. A study by Prasad et al. in 2000 also found that zinc acetate administration was associated with a lower incidence of symptoms and decreased severity of symptoms, especially cough[14]. In a 2007 study by Kurugol et al, zinc sulfate administration reduced the duration and severity of cold symptoms[15]. In a study by McElroy et al. the use of zinc gluconate reduced the duration and

the chance of having a cold[16]. In some studies, low doses of zinc were not effective, whereas high doses were effective. In many studies the effects of zinc varied according on the age of the patient, the formula of zinc syrup and its dose[9,12]. The reason for these differences may be due to the inadequate number or presence of other substances in the zinc compounds that form a complex and deactivate it. Studies on the role of zinc in the prevention of colds have shown that the use of zinc sulfate reduces the incidence of colds in children, the absence of children from school and the need for antibiotics for at least 5 months[17,18]. The use of intranasal zinc compounds such as zinc gluconate can cause a long-term anosmia; therefore, is not recommended in children[19,20].

Side effects of zinc include bad taste, irritation of the mouth and throat and nausea which makes many patients, especially children, not continue to use it [4,13]. In this study, no side effect of zinc intake was observed in patients.

Overall, based on this study and other ones, it is concluded that zinc sulfate administration within the first 24 hours of the onset of colds is effective in reducing the duration of the disease, the severity of clinical symptoms, the incidence of complications, and the need for antibiotic use.

Special Thanks from the Islamic Azad University and the Honorable Research Assistant who provided the opportunity for this research and Javaheri clinic staff.

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