http:// ijp.mums.ac.ir
Original Article (Pages: 7667-7672)

Efficacy of Golden Immunstim for Improvement of Abdominal Cramp, Diarrhea, Vomiting, and Fever in Dysenteric Patients: A Randomized Clinical Trial

Bahram Ezati[1], Mohammad Arjomandzadegan[1], Fatemeh Doreh[1], Ali Arjmand[1], Fariham Ezati[1], *Manijeh Kahbazi[1]

[1]Infectious Diseases Research Center (IDRC), Department of Pediatric, School of Medicine, Arak University of Medical Sciences, Arak, Iran.

Abstract

Background

Dysentery is described as a diarrhea with visible blood in the feces. In some regions of world, resistance to antibiotic was reported. Therefore, it is very important to use a safer treatment for this disease. We aimed to survey the efficacy of Golden Immunstim drug on improvement of abdominal cramp, diarrhea, vomiting, and fever in dysenteric patients.

Materials and Methods

This study is a randomized clinical trial, conducted on 100 children with dysentery who visited the outpatient Pediatric Clinic of Amirkabir Hospital in Arak, Iran. Patients were randomly divided into two equal intervention and control groups (n=50). The intervention group received antibiotics (ceftriaxone with a dose of 50mg/kg twice per day [BID] until the symptoms of the patient improve and continue with oral Cefixime until the completion of the 5-day treatment period), and Golden Immunstim (two capsules per day for three days), and the control group only received routine antibiotics. The researchers assessed participants on days 3, 7 and 14. Data were analyzed using SPSS 23.0 software.

Results

On days 3, 7, and 14 abdominal cramp was in 12%, 2%, 0% in intervention group, respectively and was 16%, 0%, 0% in control group ($p>0.05$); Diarrhea 8%, 2%, 0 % in intervention group, and 8%, 0%, 0% in control group ($p>0.05$). Vomiting was in 2%, 0%, 0% of intervention group and 0%, 0%, 0% of control group ($p>0.05$); Fever was in 2%, 0%, 0% of intervention group and 6%, 0%, 0% of control group ($p>0.05$).

Conclusion

According to the results of this study, it can be concluded that Golden Immunstim has no effect on dysentery symptoms.

Key Words: Child, Diarrhea, Dysentery, Golden Immunstim.

*Please cite this article as: Ezati B, Arjomandzadegan M, Doreh F, Arjmand A, Ezati F, Kahbazi M. Efficacy of Golden Immunstim for Improvement of Abdominal Cramp, Diarrhea, Vomiting, and Fever in Dysenteric Patients: A Randomized Clinical Trial. Int J Pediatr 2018; 6(5): 7667-72. DOI: **10.22038/ijp.2018.28723.2512**

Corresponding Author:

Manijeh Kahbazi (M.D), Infectious Diseases Research Center (IDRC), Department of Pediatric, School of Medicine, Arak University of Medical Sciences, Arak, Iran.

Email: m_kahbazivv@yahoo.com

Received date: Dec.13, 2017; Accepted date: Feb.12, 2018

1- INTRODUCTION

Dysentery is described as an invasive diarrhea with visible blood in the feces. Dysentery is an inflammation of the gastrointestinal tract that primarily involves the colon and is caused by repetitive passage of bloody mucoid feces. It is usually connected to a high level of morbidity and mortality and is found in small children. Other common symptoms include abdominal cramps, fever and tenesmus (1). Despite of wide progress in the health condition in the world, there are about 88.4 million children exposed to this disease, and 163,000 children deaths due this disease, and about 900,000 patients are hospitalized every year (2). Intensity of symptoms depends on the pathogen causing the disease. However, Shigella is the primary and most common cause of it (3). It has been observed that poor living standards including high population densities and poor hand hygiene are related with an increased incidence of dysentery (4). Shigella is transferred through the fecal-oral route usually in a person to person manner. Shigellosis has a wide range of symptoms from a self-limiting diarrhea without inflammation to a bloody diarrhea accompanied with fever, inflammation, abdominal cramps, vomiting, toxic appearance, etc. (5).

This disease causes many complications in children. One of the important complications is dehydration that is more likely in acute watery diarrhea. Other complications of dysentery in children include bacterial colitis, ileus, toxic megacolon, seizures, lethargy, hallucinations, and urinary tract infections (6). Dysenteric diarrhea is more likely to cause hospitalization compared with non-dysenteric diarrhea (7). The World Health Organization (WHO) suggests that all episodes of bloody diarrhea be treated with ciprofloxacin or one of the Pivmecillinam, azithromycin, and ceftriaxone (8).

On the other hand, in some regions of Asia and Africa, the increasing rate of resistance to ciprofloxacin reported for Shigella isolates, which increase the concern among physicians (9, 10). Therefore, it is very important to use a safer treatment for this disease. Golden Immunstim drug is available as capsules, each containing 225 milligrams of air limbs of Echinacea purpurea plant and 50 milligrams of Hydrastis root powder. Echinacea purpurea is one of the most common plants used to reinforce the immune system, especially, in viral diseases that compromise the system. Immunostimulatory effects of this drug include increasing cytokine production and T-cell numbers, as well as, activation of macrophages and natural killer cells (11, 12). In this paper, we aimed to survey the efficacy of Golden Immunstim drug on betterment of abdominal cramp, diarrhea, vomiting, and fever of dysentery patients.

2- PATIENTS AND METHODS

2-1. Study design and population

This study is a randomized clinical trial (IRCT2015103023876N2), conducted on 100 children with dysentery between the ages of 2 to 12 years old, whom visited the outpatient Pediatric Clinic of Amirkabir Hospital in Arak city, Iran.

2-2. Methods

Patients were randomly divided into two equal groups. The intervention group received antibiotics (such as ceftriaxone with a dose of 50mg/kg BID (twice a day) until the symptoms of the patient improve and continue with oral Cefixime until the completion of the 5-day treatment period) for 5 days and Golden Immunstim for 3 days (two capsule per day for three days) (Manufactrued in Gol Daroo Company for commercial use). The control group only received antibiotics (ceftriaxone with a dose of 50mg/kg BID until the symptoms of the patient improve and continue with

oral cefixime until the completion of the 5-day treatment period). Afterwards, all study subjects were followed for improvement of their dysentery for 14 days. The researchers assessed participants on days 3, 7 and 14. It must be noted that the goals of this study were explained to the parents of each child prior to participation and a written letter of consent was obtained.

2-3. Measuring tools

Patients' information was obtained by the telephone on the 3rd, 7th and 14th days with children's families.

2-4. Laboratory measurements

Diarrhea with visible streaks of blood or blood identified by a stool test was considered dysentery.

2-5. Intervention

Intervention of this study was prescription of Golden Immunstim for 3 days (two capsules per day for three days) (Manufactrued in Gol Daroo Company for commercial use). Golden Immunstim drug is available as capsules, each containing 225 milligrams of air limbs of Echinacea purpurea plant and 50 milligrams of Hydrastis root powder (11, 12).

2-6. Ethical consideration

This study was approved by the Ethics Committee of Arak University of Medical Sciences and was registered at the Iranian Registry of Clinical Trials (IRCT2015103023876n2).

2-7. Inclusion and exclusion criteria

Children with bloody diarrhea (visible streaks of blood or blood identified by a stool test) that diagnosed with pediatrician enrolled to study. Malabsorption, history of prolonged diarrhea, intestinal polyp, malnutrition, immune system defects, history of using probiotic components, intestinal inflammatory diseases, chronic small intestine disease, history of antibiotic consumption in the past month, development of other diseases during the healing period, parental discontent of continuing the cooperation were considered as exclusion criteria.

2-8. Data Analyses

Data obtained from each research subject was separately documented in a checklist and eventually analyzed by SPSS software version 23.0 using independent samples t-test, and Chi-squared tests. The level of significance was also less than 0.05.

3- RESULTS

In this study, we aimed to survey the efficacy of Golden Immunstim drug on improvement of abdominal cramp, diarrhea, vomiting, and fever of dysentery patients at 3, 7 and 14 days after treatment. One hundred children between ages 2 to 12 years old were enrolled in this study. Sex ratio in the intervention group was 56% boys and 44% girls, however, in the control group boys and girls were equally distributed ($P>0.05$). Assessment of housing conditions demonstrated that 92% of the intervention group and 80% of the control group were urbanites. Average and standard deviation (SD) of age was 6.56 ± 2.91 years old in the intervention group and 6.30 ± 3.13 years old in the control group. Moreover, no significant statistical difference was observed in average weight and body temperature between the control and intervention groups (**Table.1**). As shown in **Table.2**, frequency distributions of patients' complaints during hospitalization periods revealed bloody diarrhea as the most common complaint in the intervention group (42%), and fever, shivering, vomiting and diarrhea as the most common complaints in the control group (30%). Evaluations and follow-up preformed on days 3, 7 and 14 in dysentery patients indicated no statistically significant differences between the two study groups in terms of abdominal cramps, diarrhea, vomiting and fever (**Table.3**).

Table-1: General characteristics of the studied children

Parameters		Group		P-value
		Case	Control	
Gender	Boy	28 (56%)	25 (50%)	0.689
	Girl	22 (44%)	25 (50%)	
Location	Urban	46 (92%)	40 (80%)	0.148
	Rural	4 (8%)	10 (20%)	
Age (year)	Mean	6.56	6.30	0.055
	SD	2.91	3.13	
Weight (kilogram)	Mean	18.80	11.96	0.295
	SD	16.80	6.41	
Temperature (centigrade)	Mean	38.90	1.86	0.131
	SD	38.69	1.11	

SD: Standard deviation.

Table-2: Frequency distributions of patients' complaints

Distributions of patients' complaints	Group		P-value
	Case	Control	
Fever+ chill + diarrhea + vomiting	8 (16%)	15 (30%)	0.038
Bloody diarrhea	21 (42%)	10 (20%)	
Non-bloody diarrhea	6 (12%)	0 (0%)	
Fever + diarrhea + abdominal cramp	11 (22%)	15 (30%)	
Fever + Bloody diarrhea	7 (14%)	10 (20%)	
Total	50 (100%)	50 (100%)	

Table-3: patents symptoms in patients.

Parameter		Group		P-value
		Case Number (%)	Control Number (%)	
Abdominal cramp	Third day	6 (12)	8 (16)	0.774
	Seventh day	1 (2)	0 (0)	>0.999
	Fourteenth day	0 (0)	0 (0)	NA
Diarrhea	Third day	4 (8)	4 (8	NA
	Seventh day	1 (2)	0 (0)	>0.999
	Fourteenth day	0 (0)	0 (0)	NA
Vomiting	Third day	1 (2)	0 (0)	>0.999
	Seventh day	0 (0)	0 (0)	NA
	Fourteenth day	0 (0)	0 (0)	NA
Fever	Third day	1 (2)	3 (6)	0.617
	Seventh day	0 (0)	0 (0)	NA
	Fourteenth Day	0 (0%)	0 (0%)	NA

NA: Not Available.

4- DISCUSSION

This study was done to survey the efficacy of Golden Immunstim drug on betterment of abdominal cramp, diarrhea, vomiting, and fever of dysentery patients. Assessments preformed on days 3, 7 and 14 demonstrated no statistically significant difference between cases and controls in terms of improvement of dysentery symptoms including abdominal cramps (P>0.05), vomiting (P >0.05), diarrhea (P >0.05), and fever (P >0.05). There are concerns about the treatment of children with Shigellosis. The first concern in the treatment of shigellosis is the fluid and electrolyte correction that should be

consider in the treatment of children. Another concern in areas where malnutrition is common is the nutrition. The next concern is a resistant to antibiotics. Therefore, it is very important to use a safer treatment for this disease. Echinacea purpurea is a perennial plant from the Asteraceae family which is known as a valuable herb according to authentic pharmacopoeias (13). Adjuvant effect of Echinacea purpurea extract has been confirmed in multiple studies (14-16). Dysentery is a worldwide issue found in both developed and developing countries, however more prevalent in developing countries (17). Vereshchagin et al. observed that Eleutherococcus cause to shortens period of improvement of dysentery in children (18). Moreover, in another study, it was demonstrated that Astragalus had antibacterial activity against Shigella dysenteriae (19).

In contrast to previous research that proved Echinacea purpurea helpful in cases of upper respiratory infection, the results offered by Grim et al., suggested no significant difference between intervention and placebo groups with regard to incidence, duration and intensity of their respiratory infection after usage of Echinacea purpurea (20). On the other hand some studies show helpful effects of Echinacea purpurea in respiratory infection (21, 22). However, very few publications are available in previous literature that examine the effects of Echinacea purpura on dysentery, and considering the controversial results of studies done before, further research is recommended in order to obtain more definite results.

4-1. Limitations of the study

Limitation of this study is that the small sample size. Daily follow up may be shown the beneficial effect of Golden Immunstim for improvement of abdominal cramp, diarrhea, vomiting, and fever in patients.

5- CONCLUSION

According to the results of this study, it can be concluded that Golden Immunstim has no effect on abdominal cramps, fever, diarrhea and vomiting caused by dysentery in children. However, evaluation of the effects of a higher dose of this drug and with higher sample size in future studies is recommended.

6- CONFLICT OF INTEREST: None.

7- ACKNOWLEDGMENTS

The authors gratefully acknowledge the Research Council of Arak University of Medical Sciences (Grant Number: 1079) for the financial support. This work was performed in partial fulfillment of the requirements for (degree of Pediatric Medicine) of (Bahram Ezati), in School of Medicine, Arak University of Medical Sciences, Arak, Iran.

8- REFERENCES

1. Ferdous F, Ahmed S, Das SK, Farzana FD, Latham JR, Chisti MJ, et al. Aetiology and clinical features of dysentery in children aged < 5 years in rural Bangladesh. Epidemiology & Infection. 2014; 142(1):90-8.

2. Nadi A, Abedi G, Isazadeh K, Rostami F, Siamian H, Hosseini M, et al. Epidemiologic Investigation of Dysentery in North of Iran: Use of Geographic Information System (GIS). Materia socio-medica. 2016; 28(6):444.

3. Walker CL, Sack D, Black RE. Etiology of diarrhea in older children, adolescents and adults: a systematic review. PLoS neglected tropical diseases. 2010; 4(8):e768.

4. Paz MG, Almeida MF, Günther WM. Diarrhea in children and sanitation and housing conditions in periurban areas in the city of Guarulhos, SP. Revista Brasileira de Epidemiologia. 2012; 15(1):188-97.

5. Kahbazi M, Ebrahimi M, Zarinfar N, Arjomandzadegan M, Fereydouni T, Karimi F, et al. Efficacy of Synbiotics for Treatment of Bacillary Dysentery in Children: A Double-

Blind, Randomized, Placebo-Controlled Study. Advances in medicine. 2016; 2016:1-6.

6. Pfeiffer ML, DuPont HL, Ochoa TJ. The patient presenting with acute dysentery–a systematic review. Journal of Infection. 2012; 64(4):374-86.

7. Gillespie IA, O'brien SJ, Frost JA, Tam C, Tompkins D, Neal KR, et al. Investigating vomiting and/or bloody diarrhoea in Campylobacter jejuni infection. Journal of medical microbiology. 2006; 55(6):741-6.

8. World Health Organization. Department of Child and Adolescent Health and Development. Guidelines for the Control of Shigellosis, Including Epidemics due to Shigella Dysenteriae Type 1. Geneva, 2005. Available at: http://apps.who.int/iris/bitstream/10665/43252/1/924159330X.pdf

9. Nüesch-Inderbinen M, Heini N, Zurfluh K, Althaus D, Hächler H, Stephan R. Shigella antimicrobial drug resistance mechanisms, 2004–2014. Emerging infectious diseases. 2016; 22(6):1083.

10. Gu B, Cao Y, Pan S, Zhuang L, Yu R, Peng Z, et al. Comparison of the prevalence and changing resistance to nalidixic acid and ciprofloxacin of Shigella between Europe–America and Asia–Africa from 1998 to 2009. International journal of antimicrobial agents. 2012; 40(1):9-17.

11. Zhai Z, Liu Y, Wu L, Senchina DS, Wurtele ES, Murphy PA, et al. Enhancement of innate and adaptive immune functions by multiple Echinacea species. Journal of Medicinal Food. 2007; 10(3):423-34.

12. Razi Jalali MH, Alborzi A, Najafzade Varzi H, Ghorbanpour M, Derakhshan L. Survey on effects of albendazole, Echinacea purpurea, sambucus ebulus and zinc oxide nanoparticles on unilocular hydatid cyst in mice. Iranian Veterinary Journal. 2015; 11(2):68-76.

13. Rousta F, Fotouhi F, Ghaemi A, Heidarchi B, Fazeli M, Ghaffari M. Effects of aqueous Echinacea purpurea extract on immunogenicity of DNA vaccine encoding M2 gene of Influenza virus. Journal of Gorgan University of Medical Sciences. 2012; 14(4):82-8.

14. Luettig B, Steinmüller C, Gifford GE, Wagner H, Lohmann-Matthes ML. Macrophage activation by the polysaccharide arabinogalactan isolated from plant cell cultures of Echinacea purpurea. JNCI: Journal of the National Cancer Institute. 1989; 81(9):669-75.

15. Goel V, Chang C, Slama JV, Barton R, Bauer R, Gahler R, et al. Echinacea stimulates macrophage function in the lung and spleen of normal rats. The Journal of nutritional biochemistry. 2002; 13(8):487-92.

16. Goel V, Chang C, Slama JV, Barton R, Bauer R, Gahler R, et al. Alkylamides of Echinacea purpurea stimulate alveolar macrophage function in normal rats. International immunopharmacology. 2002; 2(2):381-7.

17. Wen LY, Zhao KF, Cheng J, Wang X, Yang HH, Li KS, et al. The association between diurnal temperature range and childhood bacillary dysentery. International journal of biometeorology. 2016; 60(2):269-76.

18. Vereshchagin IA. Treatment of dysentery in children with a combination of monomycin and Eleutherococcus. Antibiotiki. 1978; 23(7):633-6.

19. Miller AL. Botanical influences on cardiovascular disease. Alternative medicinereview: a journal of clinical therapeutic. 1998; 3(6):422-31.

20. Grimm W, Müller HH. A randomized controlled trial of the effect of fluid extract of Echinacea purpurea on the incidence and severity of colds and respiratory infections. The American journal of medicine. 1999; 106(2):138-43.

21. Melchart D, Linde K, Worku F, Bauer R, Wagner H. Immunomodulation with Echinacea-a systematic review of controlled clinical trials. Phytomedicine. 1994; 1(3):245-54.

22. Dorsch W. Clinical application of extracts of Echinacea purpurea or Echinacea pallida. Critical evaluation of controlled clinical studies. Zeitschrift fur arztliche Fortbildung. 1996; 90(2):117-22.