The effect of aqueous Elaeagnus angustifolia extract on acute non-inflammatory diarrhea in 1-5 year old children

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ABSTRACT

Introduction: Acute diarrhea is one of the most important causes of global childhood mortality and morbidity. The most common complication of acute diarrhea is dehydration. The aim of this study was to evaluate the use of aqueous Elaeagnus angustifolia extract in controlling non-inflammatory diarrhea in a hospital setting.

Methods: In this case–controlled randomized double blind clinical trial 80 children in age range of 1-5 years were admitted in pediatric ward with diagnosis of non-inflammatory diarrhea. The patients were randomly divided into two equal groups of 40 cases. The subject in the first group received aqueous Elaeagnus angustifolia extract, 1.2 ml/Kg single dose for 4 days duration and the second group (control group) 1.2 cm/Kg distilled water single dose for 4 days duration. Data analysis were performed by Chi-square and t-tests, using SPSS software.

Results: The groups were similar regarding gender, mean age, and frequency, and consistency of defecation (p> 0.05). Although the children seemed better in regard to frequency and consistency of defecation, however the results showed that aqueous extract of Elaeagnus angustifolia was not significantly effective in the treatment of non-inflammatory diarrhea.

 Conclusion: The results of this study demonstrated that the use of aqueous extract of Elaeagnus angustifolia was not effective in the treatment of non-inflammatory diarrhea in children.
Management of non-inflammatory diarrhea is supportive until the mucosa heals. This support includes fluid therapy and preventing nutritional damage (8).

Medical plants have been used for the management of various conditions for thousands of years (9). Elaeagnus angustifolia (Russian olive, Oleander) is one of the traditional medicines used in the management of diarrhea (9). In herbal medicine oleaster fruit or flower extract are used for management of nausea, vomiting, asthma and flatulence (10).

Extract of Elaeagnus (E) angustifolia is used as anti-inflammatory agent, muscular relaxant, antilucerogenic agent and antipyretic in traditional medicine (11-14). In Iranian traditional medicine, fruit of E. angustifolia have been used to relief pain in patients with rheumatoid arthritis (14). Also, it has been reported that the use of the fruit of E. angustifolia is beneficial in the treatment of dysentery and diarrhea (15).

In this research we evaluated the effect of aqueous E. angustifolia extract on non-inflammatory diarrhea in 1-5 age group children.

Materials and Methods

In this experimental double blind randomized clinical trial 80 children with non-inflammatory diarrhea were divided into two equal groups. The study was conducted in Pediatric ward of Hajar hospital in Shahrekord, Iran, during the period from September 2013 to May 2014.

The study protocol was approved by the Ethical Committee of Shahrekord University of Medical Sciences, Iran. Written informed consents were obtained from all parents of children. The children with severe diarrhea, chronic diarrhea and/or intractable vomiting were excluded from the study. For preparation of the aqueous extract of E. angustifolia 150 grams of E. angustifolia with cores were grinded and added 1200 ml of distilled water. The resulting solution was boiled for 20 minutes. When the volume of the solution reached to one liter, the solution was filtered after cooling. The extract was frozen in −20 °C.

Placebo was made of distill water in syringes, the same as the extract. After preparation, one code was given for placebo and other code was given to drug by a third person. For diagnosis of non-inflammatory diarrhea, stool exam was done for all the patients. This study was double blind in which the code of the drug or placebo was undefined for the patients or their parents, as well as for the doctor. In case group aqueous extract of E. angustifolia with dose of 1.2 ml/ Kg, one time per day, was used for 4 days. In control group, the same volume of distilled water was used as placebo.

Demographic data, frequency, volume and consistency of stool of both groups were recorded in first and fifth days of admission. The data were analyze using SPSS software, by Chi square and t-tests.

Results

In this study 80 children were enrolled and entered the trial. Seventeen children (8 subjects from the control group and 9 subjects from the case group) were excluded from the study because of non-compliance. The mean age in the study population was 18.65±9.13 years. The mean age in case group was 19.43±10.6 and in control group was 17.83±7.3 years. The mean weight in the study population was 10.76±2.01 Kg (10.93±2.07 Kg, in case group and 10.59 ±1.9 Kg, in control group) (p>0.05; Table 1).

The mean frequency of defecation in case group before E. angustifolia usage was 8.5 ± 4 times and after usage, it was 3.5±1.84 times and in control group it was 7.6±3.5 times and 3.4±2, respectively. Statistical analysis showed no significant difference in decrease of frequency of defecation between the two groups (p>0.05; Table 2).

There was no difference in decrease of volume and consistency of stool in two groups (p>0.05; Table 3).

<table>
<thead>
<tr>
<th>Table 1. Demographic information of study population</th>
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<tbody>
<tr>
<td>Weight (Kg)</td>
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<tr>
<td>Total</td>
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<tr>
<td>Mean</td>
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<td>Std. Deviation</td>
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<td>Minimum</td>
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<td>Maximum</td>
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<td>P-value (Case &amp; Control)</td>
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<table>
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<tr>
<th>Table 2. Frequency of defecation</th>
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<tr>
<td>Group</td>
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<tr>
<td>Mean</td>
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<td>Mean</td>
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<td>7.6</td>
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</table>
Effect of Elaeagnus angustifolia on acute non-inflammatory diarrhea

Discussion
Despite widespread use of oral rehydration therapy (ORT) and an increased understanding of the pathogenesis of diarrhea, the illness has still high mortality, especially in developing countries (16).

In folk medicine E. angustifolia has been used for diarrhea. The results of this study indicated that aqueous extract of E. angustifolia had no effect in improvement of consistency of stool and decreased volume, as well as the frequency of defecation in children with non-inflammatory diarrhea. The findings of current study are in consistent with those of a previous study which reported that this drug had no effect in decrease of consistency of mice stool (17).

In one study, Galves et al. (18) showed that tannins of the E. angustifolia decreased motility of gastrointestinal tract of mice and decreased volume of defecation in mice with diarrhea. The discrepancy of this study with our results may be due to the usage of one of the ingredients of E. angustifolia but in our study all of components in aqueous extract were used. Also, in another study lactoferrin of E. angustifolia had good effect in the treatment of diarrhea (19). But in this study all of the patients had diarrhea with iron deficiency anemia and this improvement probably was due to improvement of anemia.

In Rozhon study on mice infected with vibrio cholera showed that procyanidin, one of the ingredients of E. angustifolia was effective in diarrhea (20), but in our study we did not examine specific pathogen and a wide range of viral and bacterial infections that cause non-inflammatory diarrhea were included.

In a study in patients with allergic rhinitis, intradermal injection of extract of E. angustifolia caused positive skin test (21). Therefore, children with non-inflammatory diarrhea and simultaneously food allergy might get no beneficial effects and even worsen their conditions.

Authors' contributions
All the authors wrote the manuscript equally.

Conflict of interests
The authors declared no competing interests.

Ethical considerations
Ethical issues (including plagiarism, misconduct, data fabrication, falsification, double publication or submission, redundancy) have been completely observed by the authors.

Table 3. Percent of recovery following drug or placebo consumption

<table>
<thead>
<tr>
<th>Complete recovery</th>
<th>Relative recovery</th>
<th>Without recovery (no change)</th>
<th>p-value</th>
</tr>
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<tbody>
<tr>
<td>Extract group</td>
<td>62.5%</td>
<td>34.4%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Control group</td>
<td>51.6%</td>
<td>41.9%</td>
<td>6.5%</td>
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References