IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Potential Health Benefits of Iraqi Chamomile Flower Water Extract on Serum Bactericidal Ability of Children with Strep Throat

Asal A.Tawfeeq*

Northern Technical University/ Technical College of Kirkuk

Medical Laboratory Technique Department

Abstract

This work was applied to inspect the potential health benefits of the oral administration of the Iraqi Chamomile (*Matricaria recutita*) water extract on the bactericidal capacity of serum samples collected from a group of children with Strep throat symptoms during the year of 2019. Accordingly, a total of fifty children referred to from a private pediatric clinic at the age range of (10-15) years from both sexes were involved in this study. All children were interviewed, and their symptoms were recorded. Then, 200 ml of warm water extract of one gram of Iraqi Chamomile fresh flower was orally administered to children twice a day for ten days. Health parameters such as respiratory complications, bodyweight mass, blood hemoglobin and the bactericidal capacity of serum were all evaluated at three levels including (day-zero, day-three, and day-five) of treatment. Results showed a marked improvement in the symptoms including feeling well, less congestion of the chest, and children presented with no coughing nor sneezing on the third day of treatment. Moreover, no significant difference (P >0.05) in the bodyweight mass (BWM) parameter of the participating children when compared with their weights at the day-zero. Alternatively, a slight increase was recorded in blood hemoglobin on the fifth day of the treatment. In addition to the increase in the bactericidal capacity of children's serum compared to the percentage of cfu/ml between day-zero and the fifth day in the bacterial colony counts of the Streptococcus isolates. In addition to the significant impact of the water extract on the growth activity of the *Streptococcus* isolates *In Vitro*.

Keywords

Health benefits, Children, common cold, Iraqi Chamomile, *Matricaria recutita.*

I. Introduction

The medicinal plants were commonly used by many therapeutics all over the world as antimicrobial agents to avoid the development of multi-drug resistant bacteria[1-3]. They can exert their antibacterial activities through multiple mechanisms, so that, the interplay of plants and human health has been documented for thousands of years in many traditional forms of medicine[4-6]. One of the most common medicinal plants used for a variety of healing claims is the Chamomile, a member of the daisy family (*Asteraceae* or *Compositae*) with hollow, bright gold cones of white and yellow flowers packed with a disc of fifteen rays known as varieties of *Matricaria chamomilla* or *Matricaria recutita* [7-9].

Although, German Chamomile has been widely reported to have many therapeutic activities such as reduction of the sugar level, soothing stomach cramps and the bactericidal effect of some pathogenic bacteria[10-12].To date, most of the studies carried on the Chamomile plant has been focusing on its biological activity of individual extractable components with less literature on its potential role for children's benefit.

Consequently, this work aimed to determine the potential health benefits of the oral intake of water extract of fresh local Iraqi Chamomile flower (*Matricaria recutita*) on the bactericidal capacity of serum withdrawn from children with common cold symptoms volunteered Kirkuk city.

II. Methods

A. Volunteers

Fifty children volunteered for the study living in different districts in Kirkuk city presented with Strep throat symptoms at the age range of (10-15) years from both sexes. They were referred to after diagnosis from a private pediatric clinic where all parents of the volunteers signed consent to participate in after explaining the purpose of the study to them. Symptoms of Strep throat, bodyweight mass, blood hemoglobin parameters were all assessed for each child before the beginning of the clinical trial during the year of 2019. Ten children were deprived of oral intake of the water extract and were considered as controls, while the other forty volunteered for the treatment.

B. Medicinal Plant of the study

One kilogram of fresh flowers of naturally growing Iraqi Chamomile (*Matricaria recutita*) collected from different localities in the South of Kirkuk/ Iraq during March 2019. Flowers were kept fresh by placing them in clean plastic bags (freezer bags/quickpack GmbH/Germany).

C-Administration protocol

This methodology was followed after the procedure cited by *Tawfeeq* 2018 in Ref.[12] as follows:

1. Treatment dose prepared freshly twice each day by soaking one gram of Chamomile flowers in 200 ml of boiled water in a cup covered for 15 minutes.
2. Then, water extract was orally administrated to the volunteers twice a day for five days.

D- Evaluation of overall health parameters

Symptoms of the upper respiratory system infection (Strep throat) were evaluated according to the procedure cited in Ref.[13].

E- Calculation of Body Weight Mass (BWM)

The weights of the volunteers were recorded at the beginning of the study. Then, records were continued at the end of the study according to Ref. [12].

F- Evaluation of blood Hemoglobin

Five milliliters of whole blood collected from the volunteers (control and treatment groups) using the venipuncture method at the beginning and the end of the trial. Then, serum was collected for the evaluation of blood hemoglobin according to the standard procedures mentioned in the commercial Kits of the manufacturing company (RANDOX/UK).

G- Bactericidal Assay

This assay was carried out according to the procedure mentioned in Ref. [14].

1. The Bacterial isolates of *Streptococcus* were provided kindly by the Microbiology Lab. of the Medical Laboratory Techniques Department/Technical College of Kirkuk inoculated in nutrient medium broth (Himedia Ltd. / India) at 37°C for one hour.
2. Ten milliliters were withdrawn from each volunteer (treated group and controls) in the study at the end of each week and left for precipitation for (15 minutes) for serum collection.
3. One milliliter of each bacterial broth was mixed gently with one milliliter of the volunteer (treated group and controls) serum samples.
4. One milliliter of each mixture was poured into nutrient agar and was incubated at 37°C for 24 hours and growth was recorded as cfu/ml and compared with the control plates.

H- Evaluation of water extract effect on the bacterial growth

Evaluation of the antimicrobial activity of the water extract of the medicinal plant was carried out according to the procedure mentioned in Ref. [15].

I- Statistical Analysis

Data analyzed using the T-test of the SPSS program Ver.10 for Windows. A *P* value of $p<0.05$ was considered indicative of a statistically significant difference.

III. Results & Discussion

Results of the oral administration of the water extract of fresh local Chamomile flowers showed a significant improvement in the health parameters of the children with the Strep throat symptoms as Table (1) shows:

Table (1): Results of health parameters evaluation compared between the control and the treatment groups for five days duration

Strep throat Symptoms	Day zero		Day 1		Day3		Day5	
	Control	Treated	Control	Treated	Control	Treated	Control	Treated
Chest congestion	+	+	+	+	+	-	+	-
Fever 38°C	+	+	+	+	+	-	+	-
Headache	+	+	+	+	+	-	+	-
Abdominal pain	+	+	+	+	+	-	+	-
Nausea &vomiting	+	+	+	+	+	-	+	-
Swallown glands on the nick	+	+	+	+	+	-	+	-
White patchs on the side of throat	+	+	+	+	+	-	+	-
Swelling of uvula	+	+	+	+	+	-	+	-
Coughing	+	+	+	+	+	-	+	-

The results of this table showed a significant improvement in the health parameters of the treated children with oral water extract of local Chamomile flower probably indicating the presence of an active component in the extract. The same results obtained by Saller *et al*.in 1990 as they declared the benefits of the dose-dependency of symptomatic relief of complaints by chamomile steam inhalation in patients with a common [13].

However, consumption of about (5g) of Chamomile (*Matricaria recutita*) extract didn't show any significant difference (P >0.05) in the bodyweight mass (BWM) of the volunteers compared with their weights at the beginning of the experiments.

This result agrees with the result obtained by Tawfeeq in 2018 as the researcher recorded none-significant increase in the BWM after the consumption of about (1.5g) of German Chamomile (*Matricaria chamomilla*) tea twice a week for three months [12].

Moreover, a slight increase in the blood hemoglobin levels of all of the volunteers was noticed where their (Hb level) had recorded (1.85 mmol) increase compared with its levels at the beginning of the study. On the other hand, it was indicated in several studies a significant protective and pharmacological potential of *Matricaria recutita*[16-18]. Therefore, since it was indicated that, serum from a healthy human is known to have a bactericidal effect on some bacteria such as Enterobacteriaceae; this effect may act, in concert with phagocytes and complement to prevent bacteremia from those species (Tawfeeq, 2015). Ref [14]. In this study, serum bactericidal activity was evaluated after the oral administration of *Matricaria recutita* to sick children and the results were shown in Figure (1).

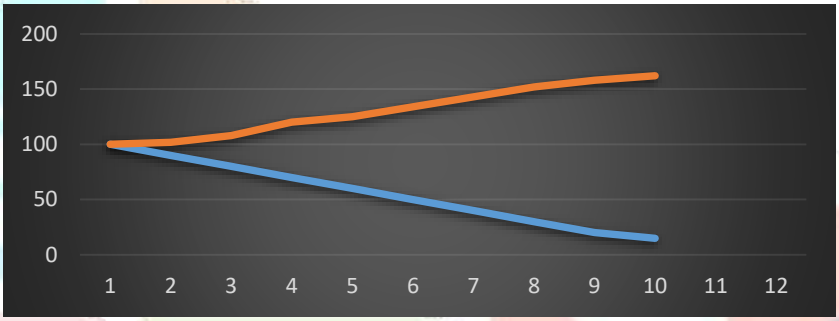

Figure (1): Impact of Local Chamomile water extract tea impact on the cfu/ml of Streptococcus strain compared between the control and the treatment groups of the study; where blue line= serum bactericidal capacity from the treatment group and *red* line= serum bactericidal capacity from control group.

Results showed a significant increase ($p<0.05$) of the bactericidal activity of the volunteers during the period of the study against the *Streptococcus* strain; whereas, serum withdrawn from controls did not show any activity against the bacterial isolates. Similar results were obtained in previous studies where inhaling steam with chamomile extract or drinking its tea has been helpful in common cold symptoms [12&13].

Moreover, it has been claimed that consumption of chamomile tea boosts the immune system and helps fight infections associated with colds [19-20]. Therefore, the water extract was tested against Streptococcus isolates and results were declared in Figure (2).

Figure (2): Impact of Local Chamomile water extract on the growth activity of Streptococcus isolates *In Vitro*

The activity of the water extract of the local Chamomile flower on the growth activity of the Streptococcus strain could be noticed from the wide inhibition zone produced around the well

containing the extract. The activity of such a naturally growing medicinal plant could be invested in the treatment of many infections.

References

[1]. Li JW, Vederas JC. Drug discovery and natural products: end of an era or an endless frontier?. Science. 2009 Jul 10;325(5937):161-5.

[2]. Srivastava JK, Shankar E, Gupta S. Chamomile: a herbal medicine of the past with a bright future. Molecular medicine reports. 2010 Nov 1;3(6):895-901.
[3]. Al-Snai AE. Iraqi medicinal plants with antibacterial effect-A review. IOSR Journal of Pharmacy. 2019;9(8):22-103.
[4]. Cragg GM, Boyd MR, Khanna R, Newman DJ, Sausville EA. Natural product drug discovery and development. InPhytochemicals in Human Health Protection, Nutrition, and Plant Defense 1999 (pp. 1-29). Springer, Boston, MA.
[5]. Newman DJ, Cragg GM, Snader KM. Natural products as sources of new drugs over the period 1981− 2002. Journal of natural products. 2003 Jul 25;66(7):1022-37.
[6]. Newman DJ, Cragg GM. Natural products as sources of new drugs over the last 25 years. Journal of natural products. 2007 Mar 23;70(3):461-77.
[7]. Yadav M, Chatterji S, Gupta SK, Watal G. Preliminary phytochemical screening of six medicinal plants used in traditional medicine. Int J Pharm Pharm Sci. 2014;6(5):539-42.
[8]. Praveen M, Srikanth TV, Krupanidhi S, Kumar RB. In-vitro Studies on Phytochemical Screening of selected plant species of Vignan's University campus, Vadlamudi, Andhra Pradesh. Journal of Pharmaceutical Sciences and Research. 2016 Sep 1;8(9):961.
[9]. Kheroda Devi M, Thangjam I, Nimai Singh W, Robindro Singh W. Phytochemical screening of selected twelve medicinal plants commonly used as spices and condiments in manipur, north-east India. International Journal of Current Research in Life Sciences. 2019;8(01):2945-7.
[10]. Kato A, Minoshima Y, Yamamoto J, Adachi I, Watson AA, Nash RJ. Protective effects of dietary chamomile tea on diabetic complications. Journal of agricultural and food chemistry. 2008 Sep 10;56(17):8206-11.
[11]. Srivastava JK, Gupta S. Antiproliferative and apoptotic effects of chamomile extract in various human cancer cells. Journal of agricultural and food chemistry. 2007 Nov 14;55(23):9470-8.
[12]. Tawfeeq AA. German Chamomile (Matricaria chamomilla) Tea impact on some blood parameters of human serum and pathogenic bacteria in Kirkuk, 2018.
[13]. Saller R, Beschorner M, Hellenbrecht D, Bühring M. Dose-dependancy of symptomatic relief of complaints by chamomile steam inhalation in patients with common cold. European Journal of Pharmacology. 1990 Jul 3;183(3):728-9.
[14]. Tawfeeq AA. Agaricus bisporous effect on Sugar, Cholesterol and the Bactericidal power of human serum. Diyala Journal For Pure Science. 2015;11(1):69-81.
[15]. Sen A, Batra A. Evaluation of antimicrobial activity of different solvent extracts of medicinal plant: Melia azedarach L. Int J Curr Pharm Res. 2012 Mar;4(2):67-73.
[16].Gupta V, Mittal P, Bansal P, Khokra SL, Kaushik D. Pharmacological potential of Matricaria recutita-A review. Int J Pharm Sci Drug Res. 2010;2(1):12-6.
[17]. Chauhan ES, Jaya A. Chamomile an Ancient Aromatic Plant-A Review. Journal of Ayurveda Medical Sciences. 2017;2(4).

[18]. Pirzad A, Alyari H, Shakiba MR, Zehtab-Salmasi S, Mohammadi A. Essential oil content and composition of German chamomile (Matricaria chamomilla L.) at different irrigation regimes. Journal of Agronomy. 2006 Jan 1;5(3):451-5.
[19]. Srivastava JK, Gupta S. Health promoting benefits of chamomile in the elderly population. InComplementary and Alternative Therapies and the Aging Population 2009 Jan 1 (pp. 135-158). Academic Press.
[20]. Srivastava JK, Shankar E, Gupta S. Chamomile: a herbal medicine of the past with a bright future. Molecular medicine reports. 2010 Nov 1;3(6):895-901.