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Anti Inflammatory Activity of Herbal Formulation Prepared Using Mint and Green Tea

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aim: The aim of my study is to evaluate the anti-inflammatory activity of herbal formulation prepared using mint and green tea.
Introduction: Green tea is a 'non-fermented' tea, and contains more catechins than black tea or oolong tea. Green tea and epigallocatechin 3-gallate, suppress the gene and/or protein expression of inflammatory cytokines and inflammation-related enzymes.Mint have a potent anti-inflammatory activity in the croton oil-induced mouse ear edema model.
Materials and Method: Preparation of herbal formulation:
To 100 ml of distilled water,1 g of tea leaves and 1 g of powdered mint is added .This mixture was heated for about 15-20 minutes and then filtered using filter paper.The mixture was again heated and concentrated from 70 ml to 20 ml.
Result: At 20 µl there is 59 percent of inhibition,at 50 µl there is 90 %of inhibition ,whereas in the standard there is only 40%of inhibition .Thus as the concentration increases the anti-inflammatory activity of the extract increases.
Conclusion: From this study we can conclude that green tea and mint have a great anti-inflammatory property.Anti-inhibitory zone ranging from 90 and is indicating that it is higher than the standard diclofenac sodium which has only 40% of inhibition.

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Keywords: Green tea; mint; anti-inflammatory; epigallocatechin.

1. INTRODUCTION

Green tea is a 'non-fermented' tea, and has more catechins when compared to black tea or oolong tea. Catechins occur in vitro and in vivo as strong antioxidants. It's content of some minerals and vitamins heightens the antioxidant potential of this type of tea [1]. Tea, a product made up from leaf and bud of the plant Camellia sinensis, is the second most consumed beverage in the world, well ahead of coffee, beer, wine and carbonated soft drinks [2]. Green tea is made with fresh leaves which are boiled to avoid fermentation, resulting in a dry and stable product. Catechin, represented by epicatechin, epicatechin 3-gallate, 3-epigallocatechin and epigallocatechin 3-gallate, are the most important flavonoids in tea [3]. Mint or menthol has a place with the Lamiaceae family, which contains around 15 to 20 plant species, including peppermint and spearmint [4]. Mints are aromatic, almost exclusively perennial herbs .They have wide-spreading underground and overground stolons [5]. Herbal sources have their starting points in antiquated societies [6-21]. It includes the restorative utilization of plants to treat infections.Since old occasions, spices have been utilized as characteristic medicines for different diseases, including viral contaminations. Treatment with home grown plants is viewed as protected as there are no or insignificant results [21].

The inflammatory process is a reaction to a injurious stimulus eliciting by a wide assortments of poisonous agents for diseases, contaminations, antibodies or actual wounds. Inflammation is a substantial reaction to injury, contamination or annihilation, portrayed by heat, redness, agony, growing and upset physiological capacities [22]. Inflammation is considered as a significant basis reaction responsible for symptoms of various chronic disorders such as cancer, septic shock, diabetes, atherosclerosis and obesity [23–25]. The inflammatory response is a process involving complex interactions among inflammatory molecules that prompts tissue to respond to traumatic, infectious, postischemic, toxic, or autoimmune injury.Numerous plants have exhibited good NO inhibition [26]. Green tea extract may be potentially used as oral rinse anti-inflammatory drug for treatment and prevention of oral inflammatory diseases [27,28]. Mint have a potent anti-inflammatory activity in the croton oil-induced mouse ear edema model, and the possible action mechanism might be attributed to its inhibitory effect on the production of NO and PGE2 [23,24]. Tannins are phenolics constituents and potent for the treating inflamed tissues [29,30]. Green tea and epigallocatechin 3-gallate, subdues the gene protein expression of inflammatory cytokines and inflammation-related enzymes [31]. Green tea supplements are accessible at pharmacies and hospitals. They can be found in liquid syrup or capsule form [32]. Plants give hundreds and thousands of different chemical constituents with varying biological activities and have been utilised in the treatment of various human ailments. Herbal medicine has been practiced in rural areas since time immemorial [24].

The health benefits of green tea depend on its bioavailability after consumption. In the body, the components in green tea may undergo metabolic processing such as glucuronidation, methylation, and sulfation, which produces active metabolites [33]. Green tea has an antiproliferative activity on hepatoma cells and a hypolipidemic activity in hepatoma-treated rats, as well as the prevention of hepatotoxicity [34]. EGCG of green tea extract is cytotoxic, and higher consumption of green tea can exert acute cytotoxicity in liver cells, a major metabolic organ in the body [35]. Green tea and green tea polyphenols are reported to inhibit carcinogenesis and malignant behavior in several diseases [36]. Cancer is one of the major diseases that cause a high number of deaths globally [37]. The prime reason for the high mortality rate of patients suffering from oral cancer is the delay in the diagnosis of the type and grade of oral cancer and also in the offering of prompt treatment [38]. Mint essential oil are extensively used as flavorings in breath fresheners, drinks, antiseptic mouth rinses, toothpaste, chewing gum and candies , such as mint candy and mint chocolate.Mint was originally used as a medicinal herb to treat stomach ache, chest pain and treating irritable bowel syndrome [39]. The liver is vulnerable to many forms of chronic injury due to its unique anatomic location and functions. It has the remarkable ability to scavenge the free radicals generated during the metabolism of various drugs [40]. Green tea consumption is associated with decreased fasting glucose levels and A1C levels, as well as reduced fasting insulin levels [41]. Diabetes is a chronic metabolic disorder steadily increasing prevalence worldwide. It is

characterized by hyperglycemia with altered carbohydrate, protein, and lipid metabolism. This may be attributed to insulin inactivity or resistance, as a direct result of destruction or dysfunction of the beta-cells of the pancreas [42,43]. Usage of nonsteroidal anti-inflammatory drugs has proven to give side effects such as stomach pain, heartburn, and stomach ulcers. Hence, it is time for us to go back to nature and promote herbal medicines rather than the allopathic medicines for having the least side effects [44,45]. Our team has extensive knowledge and research experience that has translate into high quality publications [46-56,48,57,58,6,59-64].

The aim of this study is to evaluate the anti-inflammatory activity of herbal formulations prepared using mint and green tea.

2. MATERIALS AND METHODS

Preparation of herbal formulation:
To 100 ml of distilled water,1 g of tea leaves and 1 g of powdered mint is added .This mixture was heated for about 15-20 minutes and then filtered using filter paper.The mixture was again heated and concentrated from 70 ml to 20 ml.

Anti inflammatory activity:

The anti-inflammatory activity for green tea and mint was tested by the following convention .0.05 ml of green tea and mint herbal infusion was added to 0.45 ml bovine serum albumin .

Percentage of protein denaturation was determined utilising following equation

$$\%inhibition = \frac{Absorbance\ of\ \ control - Absorbance\ of\ sample\ x100}{Absorbance\ of\ control}$$

3. RESULTS AND DISCUSSION

At 20 µl there is 59 percent of inhibition,at 40 µl there is 80 % of inhibition and at 50 µl there is 90 %of inhibition ,whereas in the standard there is only 40%of inhibition. Thus as the concentration increases the anti-inflammatory activity of the extract increases.

Fig. 1. Synthesis of herbal formulation of Green tea and Mint

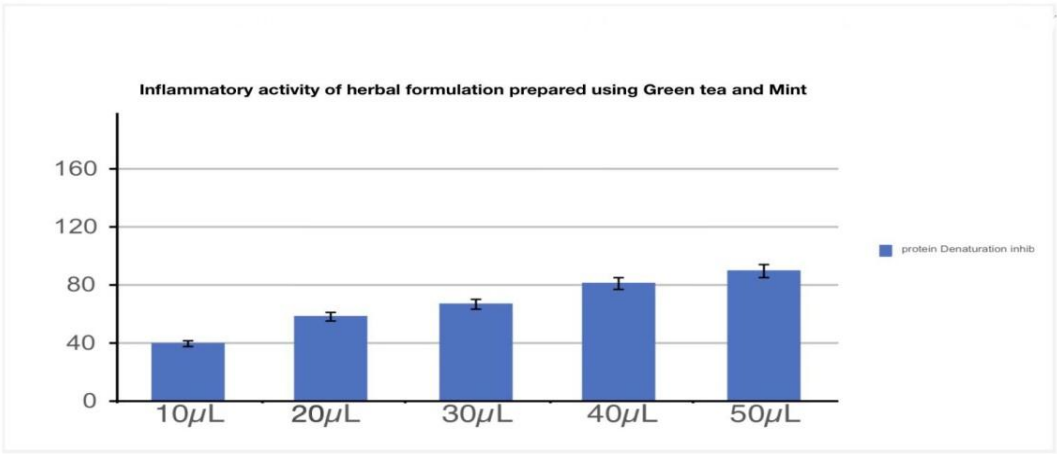

Fig. 2.The bar graph represents the anti- inflammatory activity of herbal formulation of Green tea and Mint . X axis represents the concentration in the microliter and Y axis represents the percentage of inhibition, data implies as mean±SEM

4. CONCLUSION

From this study we can conclude that green tea and mint have a great anti-inflammatory property.Anti-inhibitory zone ranging from 90 and is indicating that it is higher than the standard diclofenac sodium which has only 40% of inhibition.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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