

## **The effect of prednisolon and celery seed in treatment of chronic bronchial asthma**

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### **Abstract:-**

The effectiveness of some drugs and plants in management and prophylaxis of chronic asthma have been explored in this study . The tested agent used solely or in combination as mixture in order to increase the pharmacological efficacy or to decrease the hazardous effects by using the alternatives from plants.

The present study was carried out in the college hospital of kadhumia teaching University . fifty adult patients of both sexes were involved in this study.

Addition of celery seed to prednisolone lead to improvement of pulmonary function from 78.30±3.39 % , 2.25±0.16 L before treatment to 84.75±3.35 % , 3.06±0.05 L respectively after treatment The improvement in pulmonary function after treatment with celery seeds coincides with significant increase in Calcium , magnesium and selenium levels in serum.

### **Introduction:-**

There is an increasing , extensive interest in the general population toward herbs and the possible beneficial effect of complementary / alternative medicine in the treatment of asthma . The prevalence of electrolyte disturbance in patients with chronic asthma was common and reached up to 43%(1) , hypomagnesaemia was found to be a common disorder in patients with chronic asthma(2). Magnesium deficiency may lead to an increased excitability of bronchial smooth muscle and then bronchoconstriction (3) , low dietary Magnesium was also found to be associated with wheezes and impairment of lung function in normal subjects(4).Hypokalemia has been reported in acute asthma (5).Calcium ions are fundamental to the process responsible for the initiation and maintenance the contraction of air way smooth muscle ( 6).There is an increased in level of intracellular calcium in leukocytes of asthmatic patients were directly correlated with the severity of diseases (7).

### **Subjects and methods:**

Fifty adult patients of both sexes were involved in this study . Their age ranged from 33-55 years .All patients were non smokers because smoking affects the P.F.T ( 8) and the alcohol consumers were excluded from this study since alcohol consumption

affects serum constituents and may interact with the treatment ( 9) . The patients were not suffering from any disease other than pulmonary , Pregnant women were also excluded from the study. The diagnosis of chronic asthma had been previously established in each patient and was based on symptomatology and clinical examination. All patients were chronically using beta adrenergic agonists , steroids and theophylline preparations . The patients were referred from the outpatient clinic and received in the casualty .The patients were washed out gradually from any previous treatment and prevented from any exercise or exposure to any allergen .

The patients were advised to take special kind of diet . Any patient who was not restricted by this program or was not receiving treatment regularly was excluded from this study .The patients were divided randomly into 3 groups which includes:

Group 1 : 32 patients treated with prednisolone 0.15 mg/kg for one week.

Group 2: The same patients in first group after treatment treated with prednisolone 0.075 mg/kg once daily and celery seed at a dose of 3 gm at conc. 1g/ml honey for one week.Group3: 18 patients treated with celery seed 5 gm ( at conc. 1 gm/ml honey)once daily for one week as well as transdermal therapy with thyme oil ( massage) for one week.The weight and height of the patients were measured by a digital height and weight scale (Jvokov type) .Pulmonary function test: Pulmonary function test was performed by using a new generation of total computerized spirometer Discom-14 Autospiror ( Chest corporation Tokyo-Japan)\_Blood samples :The venous blood was aspirated (7ml) from anticubital vein by a disposable plastic pyrogen free syringes . The blood was immediately emptied in a sterile plastic test tubes which contained no anticoagulant. The serum was then separated using Hitachi centrifuge 3000 RPM for 10 minutes , and transferred by a clean pipette in to another sterile plastic test tube and kept in a deep freeze at ( -30) °C until the time of Ca , K , Se and Mg measurement.Measurement of magnesium and Selenium:Frozen serum samples were thawed at room temperature and the levels of serum Selenium and magnesium of all patients were measured by using (GFA-4B)graphite tube with auto sample dispenser model 60G flameless Atomic absorption spectrophotometer technique in the Medical Research Center / College of Medicine , Al- Nahrian University .Measurement of calcium and potassium :calcium and potassium were determined by using Flame-Emission spectrophotometer (Gleenhomp) by diluting 0.1ml of serum sample in 9.9ml D.W .The wave length was 626 nm and 797 nm for Ca and K respectively.

#### **Statistical analysis :**

Statistical analysis was performed with the SPSS 10.01 statistical package for social sciences.

The data were presented as mean + standard deviation , student t- test was used to compare between results before and after treatment and between groups . The difference was considered significant statistically when  $P < 0.05$  (10).

#### **Results:**

After administration of 0.15 mg/kg B.W of prednisolone orally FEV<sub>1</sub> % and V.C were significantly increased from  $72.75 \pm 5.09$  and  $1.05 \pm 0.15$  versus  $78.63 \pm 3.34$  and  $2.25 \pm 0.16$  respectively. At the same time both serum Mg and Se levels were significantly elevated from  $0.73 \pm 0.05$  and  $44.62 \pm 6.35$  to  $0.81 \pm 0.15$  and  $49.17 \pm 4.96$  respectively .

there were no significant changes in serum Ca and K level (table 1) .

**Table (1) The effect of a single dose of prednisolone( 0.15 mg/kg) orally given for one week on pulmonary function parameters and electrolyte serum levels**

<i>Parameter</i>	<i>Before treatment</i>	<i>After treatment</i>
<i>FEV<sub>1</sub>%</i>	72.75 ± 5.09	* 78.63 ±3.34
<i>VC/L</i>	1.05 ± 0.15	* 2.25 ± 0.16
<i>Ca/mmol/L</i>	1.97 ± 0.07	2.10 ±0.10
<i>K/mmol/L</i>	3.5 ± 0.24	3.50 ± 0.08
<i>Mg/mmol/L</i>	0.73 ± 0.05	* 0.81 ± 0.15
<i>Se µg / L</i>	44.62 ± 6.35	* 49.17 ± 4.96

n=32

Half the dose of prednisolone (0.075mg/Kg) given in combination with celery seed (3g) once daily for one week The results revealed a significant increase in the FEV<sub>1</sub>% and VC with values of 84.75±3.35 & 3.06±0.05 respectively The results of serum K, Mg and Se levels were significantly raised but with no significant changes in serum Ca level

**Table (2) The effect of prednisolone ( 0.075 mg/Kg) orally given with celery at concentration (1g /ml) orally for one week on pulmonary function parameters and electrolyte serum levels .**

<i>Parameter</i>	<i>Before treatment</i>	<i>After treatment</i>
<i>FEV<sub>1</sub>%</i>	78.3 ± 3.39	*84.75 ± 3.35
<i>VC/L</i>	2.25 ± 0.16	*3.06 ± 0.05
<i>Ca/mmol/L</i>	2.10 ± 0.10	2.3 ± 0.03
<i>K/mmol/L</i>	3.5 ± 0.08	*4.00 ± 0.06
<i>Mg/mmol/L</i>	0.81 ± 0.05	*0.92 ± 0.06
<i>Se µg / L</i>	49.17 ± 4.96	*57.73 ± 3.14

**\*Results were significant (P < 0.05)n=32**

Administration of celery seed in honey orally with transdermal thyme oil at conc. (100%) produced significant increase in FEV<sub>1</sub>% and VC from 54.82±11.32 and 0.97±0.13 to 71.39±8.80 and 2.18±0.07 respectively. These results were similar to the results of celery seed in honey when used in combination with 0.075mg/kg prednisolone (table-2). The serum Ca, Mg and Se levels were significantly elevated to 2.20±0.08, 0.83±0.02 and 53.25±8.61 versus 1.85±0.03, 0.77±0.05 and 38.60±6.21 respectively. The serum K level was insignificantly increased.

**Table (3) The effect of celery seed in honey orally on pulmonary function parameters and serum electrolyte levels.**

<i>Parameter</i>	<i>Before treatment</i>	<i>After treatment</i>
FEV1%	54.82 ( 11.32	*71.39 ( 8.86
VC/L	0.97 ( 0.13	*2.18 ( 0.07
Ca/mmol/L	1.85 ( 0.03	*2.20 ( 0.08
K/mmol/L	4.01 ( 0.13	4.16 ( 0.27
Mg/mmol/L	0.77 ( 0.05	*0.83 ( 0.02
Se µg / L	38.60 ( 6.21	*53.25 ( 8.61

**N= 18**

### **Discussion:**

The parameters of pulmonary function (FEV1% & VC ) were used to assess the severity of bronchial asthma and also to reflect the beneficial effect of drugs and medicinal plants when used to treat asthmatic patients. The elevation in the FEV1% and VC values explain the improvement in pulmonary function with decrease in severity and frequency of asthmatic attacks. In this study, the prevalence of electrolytes disturbance in patients with chronic asthma was common. Serum Mg and Se levels were decreased to levels lower relatively than those of calcium and potassium which were found to be the two most common electrolyte disturbances in patients with chronic, stable asthma. The ionized  $\text{Ca}^{++}$  stimulates the muscle contraction, low extra cellular concentration of  $\text{Ca}^{++}$  is accompanied by bronchoconstriction ( 11). The injection of histamine (I.V.) caused a significant reduction in serum  $\text{Ca}^{++}$  levels. This action may be related to mobilization of  $\text{Ca}^{++}$  into the cell causing a rise in intracellular  $\text{Ca}^{++}$  and Then bronchospasm ( 12).  $\text{Ca}^{++}$  ions are fundamental to the processes responsible for the initiation and maintenance of the contraction of airway smooth muscle cells (6), and ( 7) reported that there was an increase in the intracellular Ca of leukocytes of asthmatic patients that was directly correlated with the severity of asthma, all that explain the low concentration of  $\text{Ca}^{++}$  ions in serum samples before any treatment. Most of the patients recorded low level of serum  $\text{Ca}^{++}$ , some of them showed hypocalcaemia (serum level <2.1 mmol/L). This result is not compatible with that found by (1) who reported that there was no hypocalcaemia in chronic asthmatic patients. Hypokalemia was reported in the patients, with bronchial asthma K efflux lead to airway smooth muscle relaxation (15). Hypokalemia may be caused by active inhibition of K secretion in the cortical collecting tubules, that resulted in hyper polarization of the cellular membrane potential (16), low dietary intake was the main factor hypokalemia. Hypomagnesaemia (Serum level <0.74 mmol/L) was found to be a common disorder in patients with chronic asthma (2) and this result was compatible to that found in our study before any treatment as well as abnormal P.F.T. Some reports demonstrated an association between Mg deficiency and increased airway hyper-reactivity, pulmonary resistance and ventricular arrhythmia (17). low dietary Mg was also found to be associated with wheezing and impairment of lung function in normal subjects ( 4). About 100% of the asthmatic patients showed a decrease in serum Se level and these results are similar to that obtained by (18), who reported that serum Se level in female was lower than that of male but the differences were not significant. An other study found a positive correlation between serum Se level and each of FEV<sub>1</sub>% and VC (19). (20) reported that Se level when decreased the possible risk of asthma increased due to a decrease in glutathione peroxidase and the antioxidant activity. Celery seeds with demulcent effect of honey produced bronchodilation and improvement to all the symptoms of asthma,

that may be related to antioxidant effect of vitamins containing celery seeds (21) which also correct the level of serum Se whereas the serum Mg level elevated as a result of the plant containing magnesium. level of serum Ca may be increased due to relaxant activity of celery seed , also may be related to high concentration of Ca in the seeds ( table 3). The FEV1 % and VC values showed no significant improvement when the asthmatic patients were treated with prednisolone at a dose of (0.15 ) mg/kg ( table 1). Using celery seeds with 0.075mg/kg prednisolone resulted in significant elevation of all the parameters and improvement of the symptoms. High K<sup>+</sup> concentration in plant may explain the increase in K level. All the data of combination showed result better than using 0.15mg/kg prednisolone alone with lower adverse effects. (table 2). Mixing celery seeds with thyme showed a high increase in the PFT values in our study , this combination also improved the patients urinary function and also showed the effect of thyme when used as oil for massage therapy in chronic asthma (table 3).

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