EFFECT OF GARLIC (ALLIUM SATIVUM) ON BLOOD PRESSURE IN HEALTHY VOLUNTEERS

Haider Al-wafî, Zuhair Al-Shahcen, Ayad Al-Makki
College of Pharmacy, University of Basrah, Basrah, Iraq
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ABSTRACT
The study was conducted on two groups of individuals. Group A (treatment) consisted of 10 healthy volunteers who were administered garlic (Allium sativum) for thirty days and then followed for another 30 days without garlic. Group B (control) 11 healthy subjects served as a control. Garlic ingestion significantly lowered (p<0.05) in diastolic B. Pr. in male and total after 7 days and non-significantly (p>0.05) in systolic B. Pr. on male, female and total. Significantly lowered (p<0.05 and p<0.025) in diastolic B.Pr. in male and total after 14 days respectively and non-significantly (p>0.05) in systolic B.Pr. at male, female and total. Significantly lowered (p<0.025 and p<0.01) in diastolic B.Pr. in male and total after 21 days. Respectively and non-significantly (p>0.05) in systolic B.Pr. at male, female and total. Significantly lowered (p<0.01) in diastolic B.Pr. in total and non-significantly (p>0.05) in diastolic B.Pr. at male and female whereas significantly lowered (p<0.01) in systolic B.Pr. on female and non-significantly (p>0.05) in systolic B.Pr. at male and female after 28 days. Non-significantly (p>0.05) in diastolic and systolic B.Pr. on male, female and total after 30 days without garlic.

INTRODUCTION
Allium sativum L. (L.) is hardly perennial with narrow flat leaves, small purplish white flowers and compound bulbs. The bulb is compound in nature and is separable into many small cloves which are covered by thin white or pinkish dry scales. Garlic (Allium sativum L.) is cultivated in Iraq as garden-crop or as secondary crop during the months of September-November the bulbs was mature in April-May.

Medicinally, garlic is reputed for a long time and is used in various preparations of indigenous medicines. It is administered in the cases of pulmonary phthisis, bronchiecstasis, gangrene of lung and whooping cough. Garlic juice is given in laryngeal tuberculosis, lupus and duodenal ulcers, garlic is reported to have anti-hyperlipidemic, and anti diabetic properties and many have an inhibitory effect on the process of atherogenesis. It is reported to have anti-atherosclerosis.

MATERIALS AND METHODS
Plant material. Garlic was collected from Basrah region in April, 1999. The plant was potentially authenticated and voucher specimens 2885 were deposited in the herbarium of Basrah College of Science, University of Basrah.

Subject. A total of 21 subjects, 20-25 years of age, were selected for the study after given written informed consent. They were non smoker, apparently healthy volunteers. Their weight within the normal range. They have no family history of hypertension, and no drug had taken in the past four weeks. The participants were mainly selected from undergraduate and post graduate students in the college of science, University of Basrah.

The volunteers were randomly allocated into two groups (11 subjects as control, 10 subjects as treatment). Group A received 900 mg/day garlic powder for 30 days and then followed for another 30 days without garlic. The dose was chosen according to previous
studies of garlic on healthy volunteers. Group B the control group received placebo. The level of B.P. was measured by right hand with normal state (horizontal).

Sphygmomanometer, mercurial-CE-0483, has scale 0-300mm Hg, made in Japan.

Statistical analysis: All values were expressed as the mean ± S.D. Significance differences between treatment and control were determined using ANOVA: Two-factors without replication, Microsoft excel program. Difference were considered significant at the p<0.05 level.

RESULT

Garlic administration for level of Systolic B.P. after 30 days was non-significant (p>0.05) in male and total, however, high significant (p<0.01) in female (after 28 days) as compared with control. After 60 days was non-significant (p>0.05) in each group as in table (1,2) figure (1,2,3). Whereas the effect on level of Diastolic B.P. after 30 days was non-significant (p>0.05) in female and significant (p<0.01, p<0.05, p<0.025) in male and total, then after 60 days was non-significant (p>0.05) in each group with compared with control as in table (1,2) and figure (4, 5, 6).

DISCUSSION

The study was a chronic type, and confirms results of other clinical studies on the pressure-lowering potency of garlic powder, but it differs in materials, methods, and results, accompany with different results. The daily dosage of garlic which intake was depends on other studies.

In the present study the pressure-lowering effect were particularly observed regarding SBP (systolic blood pressure) in which the reduction was just highly significant in the female at the end of 28 days and non-significantly in the male group. A possible cause for such results probably due to low number of participates, high value S.D. and may be female more careful in the study, whereas, DSBB (diastolic blood pressure) was significantly in male, high significantly in total and non-significantly in female, apparently, high sig. in total because of high number of participates but non-sig. in female due to high value to S.D.

Generally, from tables and figures the powder of garlic has significantly lowering effect on SBP and DBP with different results between them when contrast with control (placebo intake). Mainly studies certain the activity of garlic as lowering-blood pressure due to present volatile oil particularly allyl in compound.

The exact mechanism of action for lowering blood pressure by garlic remains unknown. It may be because reduce potassium which increase blood pressure or by inhibiting ACE (angiotensin converting enzyme) by Anti-ACE peptides, this enzyme converts angiotensin I to angiotensin II a compound that increases both the fluid volume and the degree of constriction of the blood vessels. By inhibiting the formation of this compound, Anti-ACE peptides relax the arterial walls and reduce fluid volume or because increase CoQ10 (ubiquinone) is a coenzyme essential for the proper functioning of the mitochondria it acts as "spark plug" during the production of ATP, the energy currency of all body processes. An increased efficiency in energy production results in a stronger heart muscle or because of garlic elevated VitC which increase HDL then reduce blood pressure or garlic lead to increase L-proline and L-lysine which reduce blood pressure.

Conclusion

The dry powder of garlic has ability to reduce level of systolic (more in female p<0.01 after 28 day) and diastolic (more in male p<0.025 after 21 day) of B.P. in healthy volunteers regarding daily intake (900mg/day) for 30 days.
### Group A

Table (1) effect of dry powder of garlic on level of (B.Pr.) in healthy volunteers without garlic (control).

<table>
<thead>
<tr>
<th>Sex</th>
<th>No</th>
<th>Status</th>
<th>B. Pr. 0 day</th>
<th>B. Pr. 7 day</th>
<th>B. Pr. 14 day</th>
<th>B. Pr. 21 day</th>
<th>B. Pr. 28 day</th>
<th>B. Pr. 60 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>20-25</td>
<td>6 Systolic diastolic</td>
<td>109±5 70±3</td>
<td>113±9 71±5</td>
<td>111±7 70±5</td>
<td>112±8 72±7</td>
<td>115±8 72±5</td>
<td>113±8 71±6</td>
</tr>
<tr>
<td>female</td>
<td>20-25</td>
<td>5 Systolic diastolic</td>
<td>122±4 77±6</td>
<td>122±5 78±5</td>
<td>120±6 75±5</td>
<td>119±7 73±7</td>
<td>123±8 80±4</td>
<td>119±8 78±5</td>
</tr>
<tr>
<td>Total</td>
<td>20-25</td>
<td>11 Systolic diastolic</td>
<td>115±8 73±5</td>
<td>117±9 76±7</td>
<td>115±8 72±4</td>
<td>114±7 74±7</td>
<td>119±9 76±6</td>
<td>115±6 75±4</td>
</tr>
</tbody>
</table>

### Group B

Table (2) effect dry powder of garlic on level of B.Pr. in healthy volunteers (treatment).

<table>
<thead>
<tr>
<th>Sex</th>
<th>No</th>
<th>Status</th>
<th>B. Pr. 0 day</th>
<th>B. Pr. 7 day</th>
<th>B. Pr. 14 day</th>
<th>B. Pr. 21 day</th>
<th>B. Pr. 28 day</th>
<th>B. Pr. 60 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>20-25</td>
<td>5 Systolic diastolic</td>
<td>114±6 75±8</td>
<td>113±8 70±5</td>
<td>112±6 69±5</td>
<td>112±6 66±5</td>
<td>115±6 70±5</td>
<td>115±6 75±4</td>
</tr>
<tr>
<td>female</td>
<td>20-25</td>
<td>5 Systolic diastolic</td>
<td>115±6 75±6</td>
<td>114±5 72±8</td>
<td>112±3 70±7</td>
<td>112±5 69±6</td>
<td>118±5 70±5</td>
<td>117±3 78±3</td>
</tr>
<tr>
<td>Total</td>
<td>20-25</td>
<td>10 Systolic diastolic</td>
<td>114±6 75±8</td>
<td>114±7 72±8</td>
<td>115±7 70±6</td>
<td>112±5 67±6</td>
<td>112±6 70±5</td>
<td>115±4 70±5</td>
</tr>
</tbody>
</table>

a- *P* < 0.01
b- *P* < 0.05
c- *P* < 0.025

B.Pr.—blood pressure

### Group C

Table (3) effect dry powder of garlic on level of B.Pr. in healthy volunteers (treatment).

<table>
<thead>
<tr>
<th>Sex</th>
<th>No</th>
<th>Status</th>
<th>B. Pr. 0 day</th>
<th>B. Pr. 7 day</th>
<th>B. Pr. 14 day</th>
<th>B. Pr. 21 day</th>
<th>B. Pr. 28 day</th>
<th>B. Pr. 60 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>20-25</td>
<td>5 Systolic diastolic</td>
<td>114±6 75±8</td>
<td>113±8 70±5</td>
<td>112±6 69±5</td>
<td>112±6 66±5</td>
<td>115±6 70±5</td>
<td>115±6 75±4</td>
</tr>
<tr>
<td>female</td>
<td>20-25</td>
<td>5 Systolic diastolic</td>
<td>115±6 75±6</td>
<td>114±5 72±8</td>
<td>112±3 70±7</td>
<td>112±5 69±6</td>
<td>118±5 70±5</td>
<td>117±3 78±3</td>
</tr>
<tr>
<td>Total</td>
<td>20-25</td>
<td>10 Systolic diastolic</td>
<td>114±6 75±8</td>
<td>114±7 72±8</td>
<td>115±7 70±6</td>
<td>112±5 67±6</td>
<td>112±6 70±5</td>
<td>115±4 70±5</td>
</tr>
</tbody>
</table>

a- *P* < 0.01
b- *P* < 0.05
c- *P* < 0.025

B.Pr.—blood pressure
تأثير استخدام الثوم (ALLIUM SATIVUM) على مستوى ضغط الدم في الأشخاص الأصحاء

حامد الراوي، نصر الشاهين، أيوب المكي
كلية الطب، جامعة الصدر، العراق

الخلاصة

جرت الدراسة على مجموعتين من الأشخاص الأصحاء، المجموعة الأولى، ويتكون من 100، الذين كانوا يتلقوا مسحوق الثوم مخلوط (900mg/day) لمدة 30 يومًا ثم توقفوا إلى 30 يومًا أخرى دون تعامل. كان في المجموعة الثانية 11 شخصًا وتعتبر مجموعة المقراة. لوحظ أن تولاء السلوكيات في المجموعة الثانية كان منخفضًا عن تلك الموجود في المجموعة الأولى (النّتين) في سلوك الدم وظائف الدم، وكان منخفضًا عن ذلك في المجموعة الأولى (النّتين) والثلاثة بعد 7 أيام من حلول السلوكيات. بقي ضغط الدم وما إلى ذلك في المجموعة الثانية، بينما كان ضغط الدم في المجموعة الأولى (النّتين) والثلاثة، إلى جانب ذلك في المجموعة الأولى (النّتين) والثلاثة، بعد 11 يوم كان النتائج غير معنوي (p>0.05) في كل من المجموعتين. أما بعد 30 يومًا، كان الأشخاص في المجموعة الأولى (النّتين) والثلاثة، بعد 30 يومًا، كان النتائج غير معنوي (p>0.05) في كل من المجموعتين. وللضغط دم، في كل من المجموعتين، كان الضغط دم قبل المجموعة الثانية، بينما كان غير معنوي (p>0.05) في كل من المجموعتين. أما بعد 30 يومًا، كان النتائج غير معنوي (p>0.05) في كل من المجموعتين. في المجموعة الثانية، كان الأشخاص في المجموعة الأولى (النّتين) والثلاثة، بعد 30 يومًا، كان النتائج غير معنوي (p>0.05) في كل من المجموعتين. لاستنتاج

لا يوجد أي تأثير ملاحظي لتناول مسحوق الثوم المخلوط في مستوى ضغط الدم بين المجموعتين الأصحاء، وذلك بعد توقف الدراسة. ومع ذلك، يظهر أن هناك تأثيرًا على مستوى ضغط الدم في المجموعة الأولى (النّتين) والثلاثة، بعد 7 أيام من حلول السلوكيات. ولكن، في المجموعة الثانية، كان نتائج ضغط الدم غير معنوي (p>0.05) بعد 30 يومًا من حلول السلوكيات. لنتيجة هذه الدراسة، يمكن أن نستنتج أن تناول مسحوق الثوم المخلوط له تأثيرات على ضغط الدم في الأشخاص الأصحاء، ولكن ذلك من الفحص من فحص لاحق.

REFERENCES


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