Study the Effect of Natural Products in Acne Patients

Hamdia Ahmed Helal¹, Ezzat Abd el Zaher Mohamed², Azza Gaber Antor Farag³, Amany Ramadan Abdel Rashed

Nutrition and Food Science Department, Faculty of Home Economics, Menoufia University¹, Pharmacognosy Department, Faculty of Pharmacy, Al Azhar University, Cairo², Dermatology, Andrology & STDs Department, Faculty of Medicine, Menoufia University³.

Abstract:
**Background:** Acne vulgaris (AV) is a common skin condition among adolescents and young adults, that may be affected by diet.

**Objectives:** This study aimed to investigate the effect of dietary intervention and some natural products in acne vulgaris.

**Methods:** A case study was conducted involving 112 participants aged 15-25 years. Cases were divided into three groups: Group I: included patients using formula 1 (honey, bees wax, coconuts oil, turmeric extract, garlic extract, and chamomile extract) group II: included patients using formula 2 (honey, bees wax, thyme oil, cinnamon oil, and marjoram oil), and group III: included patients having a healthy diet. Blood Lipids Profile was determined as well as the degree of importance in patients of AV.

**Results:** Acne severity showed a significant reduction in post-treatment compared to pre-treatment state in all studied patient groups (users of formula 1, formula 2, and healthy diet). Blood Lipids Profile showed significant reduction in the healthy diet group compared to the cases group.

**Conclusions:** These results indicated that natural products might have an action in acne vulgaris management program, as well as dietary intervention.

**Introduction**

Acne is a chronic inflammatory disease of the pilosebaceous glands, characterized by comedones, papules, pustules, cysts, nodules, and occasionally scars (Shen et al., 2012). The condition starts after puberty and is a common skin disorder in adolescents and young adults. It
affects the face, anterior chest, and upper back (Dréno, 2017). Pathogenesis of acne includes follicular hyper keratinization, sebaceous hyper secretion due to androgen stimulation, follicular colonization by Propionibacterium acnes and immune and inflammatory responses (Shen et al., 2012). Western diet, particularly dairy products may be associated with acne. Acne is absent in populations consuming low glycemic load diet and not consuming refined sugars, grains, milk and dairy products (Romańska-Gocka et al., 2016).

The treatment of many diseases by using medicinal plants is an age old practice. The world health organization (WHO) stated that more than 80% of developing countries in the world use medicinal plants for their health care (Genady, 2015).

**Subjects and methods**

**Materials:** All raw materials were purchased from local market of Shiben El-Kom, Menoufia, Egypt.

**Kits:** All kits including were purchased from Bio Diagnostics, Cairo, Egypt.

**Extract preparation:** Dried herbals were grounded using a mechanical grinder to yield fine powder. Ten grams of the powder was mixed with 100 ml of methanol 70% in conical flask and kept in shaking incubator at 100 rpm for 24 h then it was filtered. Extract filtrates were concentrated on a rotary evaporator at 45ºC for methanol elimination, and the extracts were kept in sterile bottles under refrigerated conditions until use. (Joyce et al., 2006).

**Method of formulation:** Formula 1 preparation, bees wax and honey were melted in a glass container and heated in a water bath till completely dissolved. In another glasscontainer, weighted extracts of turmeric, garlic and Chamomile. Both the containers were removedand both the mixtures were combined together slowly andstirred until it becomes creamy. Finally coconut oilwas added. Formula 2 was prepared by same methods.

**Formula ingredients:**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantities</th>
<th>Ingredients</th>
<th>Quantities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honey</td>
<td>44 g</td>
<td>Honey</td>
<td>54 g</td>
</tr>
<tr>
<td>Beeswax</td>
<td>40 g</td>
<td>Beeswax</td>
<td>40 g</td>
</tr>
<tr>
<td>Coconut oil</td>
<td>10 ml</td>
<td>Thyme oil</td>
<td>2 ml</td>
</tr>
<tr>
<td>Turmeric extract</td>
<td>2 g</td>
<td>Cinnamon oil</td>
<td>2 ml</td>
</tr>
<tr>
<td>Garlic extract</td>
<td>2 g</td>
<td>Marjoram oil</td>
<td>2 ml</td>
</tr>
<tr>
<td>Chamomile extract</td>
<td>2 g</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Subjects

A total of 112 untreated acne patients age range 15-25 years, who had inflammatory and non-inflammatory acne lesions and had not taken any medication for acne, were included in the study. Informed consent was obtained from each participant. Patients were attending the Dermatology Clinic in Menofia University Hospital, Egypt during the period April 2016 to October 2016. Clinical data were collected. The collected data included patient age, sex, body mass index, and family history. Body mass index (BMI) was calculated based on height and weight as previously described Al-Azzam et al., (2014). Patients were randomly divided into three groups: group I treated with formula 1 and group II treated with formula 2 twice a day. Group III applied diet program containing a healthy diet low (refined carbohydrate, snacks, fast foods, and carbonate drink) and high (vegetables, fruits, and water). At baseline and after treating, counting acne lesions and macro-photography had evaluated. After overnight fasting blood samples were withdrawn from each participant and used to lipid profile and glucose analysis.

Lipid profile: Quantitative estimation of total cholesterol (TC), high density lipoprotein -cholesterol (HDL) and Triglycerides (TG) using colorimetric enzymatic method, using standard enzymatic colorimetric kits (Spinreact diagnostics kit, Spain) and low density lipoprotein -cholesterol (LDL) was elaborated by Modified Friedewald equation (Ghasemiet al., 2018).

Glucose: was determined according to (Schumann et al., 2002) using ELITech Clinical Systems spectrophotometer at 340 nm.

Statistical analysis of the data was performed using the statistical package for the social science (SPSS) program. Results were expressed as mean ± standard deviation. Data were analyzed using Chi squared test, t-test and ANOVA. The differences were considered significant if the obtained \( p \) value was less than or equal to 0.05 (Snedecor and Cochran, 1980).
Results and discussion

Table (1): Characteristics of acne patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Age</th>
<th>BMI (kg/m²)</th>
<th>Family history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>20.3 ± 2.7</td>
<td>22.6 ± 2.5</td>
<td>63(55.8):50(44.2%)</td>
</tr>
</tbody>
</table>

Most of the participants were young adults with a mean age of 20.3 years and a mean BMI of 22.6 kg/m² as well as (44.2%) of these acne patients had family history as shown in table (1).

Table (2): Comparison of lipid profile between groups

<table>
<thead>
<tr>
<th>Analyses</th>
<th>Group I Mean ± SD</th>
<th>Group II Mean ± SD</th>
<th>Group III Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>182.4 ± 3.9</td>
<td>182.0 ± 4.6</td>
<td>159.3 ± 2.8*#</td>
</tr>
<tr>
<td>TG</td>
<td>95.3 ± 15.2</td>
<td>93.9 ± 16.4</td>
<td>89.8 ± 5.8</td>
</tr>
<tr>
<td>HDL-C</td>
<td>99.2 ± 10.9</td>
<td>99.3 ± 10.7</td>
<td>101.0 ± 5.2</td>
</tr>
<tr>
<td>LDL-C</td>
<td>65.1 ± 8.8</td>
<td>64.9 ± 8.7</td>
<td>40.4 ± 3.2*#</td>
</tr>
<tr>
<td>VLDL</td>
<td>19.1 ± 3.0</td>
<td>18.8 ± 3.3</td>
<td>18.0 ± 1.2</td>
</tr>
<tr>
<td>Glucose</td>
<td>98.7 ± 15.6</td>
<td>97.4 ± 16.0</td>
<td>76.9 ± 2.9*#</td>
</tr>
</tbody>
</table>

TC: total cholesterol, TG: triglycerides, HDL-C: high density lipoprotein cholesterol, LDL-C: low density lipoprotein cholesterol, VLDL: very low density lipoprotein cholesterol. Significant differences are indicated by \( p \leq 0.05 \). *significant between group I and II, # significant between group II and III.

Comparison of lipid profile between groups is presented in table (2). Total cholesterol and LDL showed statistically significant decrease in group III compared with other groups. These results were agreement with Manzoor et al., (2016) who showed statistically significant difference in the level of Total cholesterol, VLDL, triglyceride and HDL ratio between acne patients and controls. There is a statistically significant rise in levels of LDL, VLDL, Triglyceride and TC/HDL and decrease in levels of HDL with the severity of acne. Also, Jiang et al., (2015) and Romańska-Gocka et al., (2018) reported that adult women with acne had statistically significantly increased levels of TC, TG and LDL-C compared to healthy controls \( (p < 0.05) \). The level of HDL-C did not differ between the two groups.

HDL decreased in group I and II compared with group III. Triglyceride and VLDL level decrease ingroup III than other groups. Da Cunhaet al.,(2015) reported that patients with grades II and III acne are more likely to have total cholesterol and low-density lipoprotein
Glucose level showed significant reduction in group III compared with other groups. Tayel et al.,(2013) reported that after low glycemic load dietary intervention fasting serum sugar decreased significantly ($P<0.05$).

**Table (3): Comparison of acne severity between pre and post uses formula1, formula 2 and applied healthy diet**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>group I Pre</th>
<th>Post</th>
<th>group II Pre</th>
<th>Post</th>
<th>group III Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acne severity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild (%)</td>
<td>6.5%</td>
<td>87.0%</td>
<td>0%</td>
<td>95.7%</td>
<td>10.0%</td>
<td>45.0%</td>
</tr>
<tr>
<td>Moderate</td>
<td>63.0%</td>
<td>13.0%</td>
<td>69.6%</td>
<td>4.3%</td>
<td>45.0%</td>
<td>30.0%</td>
</tr>
<tr>
<td>Severe</td>
<td>30.5%</td>
<td>0%</td>
<td>30.4%</td>
<td>0%</td>
<td>45.0%</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

P-value          | .000         | .000 | .045        |

Acne cases detected in (6.5%) had mild degree of severity, (63.0%) moderate degree and (30.5%) severe degree at baseline before formula 1 used as shown in table (3). While after use formula 1, (87.0%) of cases were transferred to be mild and (13.0%) became moderate. Also, at baseline before formula 2 used (69.6%) had moderate degree and (30.4%) severe degree. While after use formula 2, (95.7%) of cases were transferred to be mild and (4.3%) became moderate. There is a statistically significant decreasing in acne severity in post-treatment formulas than pre-treatment state. These results were in agreement with Yang et al., (2009) and Pornpattananangkul et al., (2013) who suggested that (liposomal lauric acids) LipoLA hold a high therapeutic potential for the treatment of acne infection and other $P. acnes$ related diseases. Also, Rasheed et al., (2011) reported that poly herbal anti-acne face wash gels containing the extracts of plants Rawvolfia serpentina, Curcuma longa, and Azadiracta indica considered as an effective herbal formulation for acne treatment. Eady et al., (2013) Xylose and sucrose are nonfermentable by $P. acnes$ and have been used to reduce water activity and hence bacterial colonisation of wounds. A new follicularly targeted topical treatment for acne based on this approach should be well tolerated and highly effective.

Also, commonly utilized biologically based complementary and alternative therapies for acne and rosacea. Therapies discussed include vitamin C, nicotinamide, zinc, tea tree oil, green tea, resveratrol, curcumin, feverfew, licorice, chamomile, *polypodium leucotomos*, and nutrition-based approaches (Kallis et al., 2018). The various types
of honey demonstrated significant but variable antioxidant, antibacterial, and antifungal activities Masalha et al., (2018). Julianti et al., (2017) showed that the combination of cinnamon bark extract and honey against P. acnes and S. epidermidis showed additive activity with a fractional inhibitory concentration index (FICI) value of 0.625. Therefore, the combination of cinnamon bark extract and honey has potential activity against acne-causing bacteria. Also Talebet et al., (2018) and Wijesundara and Rupasinghe, (2018) reported that oregano and thyme formulation showed superior healing and antimicrobial effects compared to the reference antibiotic. Collectively, these data suggested that oregano oil Nano emulsion is a potential natural and effective alternative for treating acne and overcoming the emerging antibiotic resistance.

Statistically significant decrease was observed between pre and post dietary intervention in acne grading score. These results are in agreement with (Kwon et al., 2012), reported that Subjects within the low glycemic load (LGL) group demonstrated significant clinical improvement in the number of both non-inflammatory and inflammatory acne lesions. Also, (Tayel et al., 2013) found significant decreasing in the means score of acne before and after LGL diet intervention (25.43±3.61 and 16.35± 2.50, respectively; P= 0.026). 

photo (1) shows examples of cases with acne (cases A,C,E) and the same cases after uses formula 1 (B), formula 2 (D) and diet program that became mild (F).
Reference


دراسة تأثير بعض المنتجات الطبيعية على مرضى حب الشباب

حمديه أحمد هلال، عزة غلال 나오ه محمد، عزة جابر عنتر فرج.
أماني رضوان عبد الرشيد منصور.
قسم التغذية وعلوم الأطعمة كلية الاقتصاد المدنى - جامعة المنوفية، قسم العقاقير، كلية الصيدلة - جامعة الأزهر القاهرة، قسم الجذيدنة والتناسليه، كلية الطب - جامعة المنوفية.

الملخص العربي

حب الشباب هو مرض جلدي شائع بين المراهقين، والذي قد يتأثر بالنظام الغذائي.
وتهدف هذه الدراسة إلى دراسة تأثير التدخلات الغذائية وبعض المنتجات الطبيعية على حب الشباب.

تم إجراء دراسة تضم 112 مريض تتراوح أعمارهم بين 15 - 25 عاما. وتم تقسيم الحالات الثلاث مجموعات: المجموعة الأولى: تضمن المرضى الذين يستخدمون التركيب الأول والتي تتكون من عمل النحل وشمع العسل وزيت جوز الهند وستخلص الكركم والثوم والبابونج.
المجموعة الثانية: تضمن المرضى الذين يستخدمون التركيب الثاني والتي تتكون من عمل النحل وشمع عسل النحل وزيت الزعتر والقرفة والبردقوش، وجميع المجموعة الثالثة: شملت المرضى الذين قاموا بإتباع نظام غذائي صحي. وقد تم قياس نسبة الدهون في الدم للمريض وكذلك قياس نسبة التحسن في درجة حب الشباب.

أظهرت النتائج تحسنا معنوي في درجة حب الشباب بعد استخدام التركيب الأول، وكذلك النظام الغذائي الصحي. كما كان للنظام الغذائي الصحي تأثير معنوي على نسبة الدهون في الدم.

تشير هذه النتائج إلى أن المنتجات الطبيعية في المجموعات الأولي والثانية والثالثة قد أظهرت تحسنا في علاج حب الشباب.