

## Successful treatment of facial vitiligo with honey bee, *Allium cepa* and *Avena sativa* combined to sun light exposure: A case clinical trial

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### ABSTRACT

**Objectives:** To evaluate efficacy and safety of a natural formulation, completed by sun light exposure, in the management of localized vitiligo.

**Case summary:** A 34 –year- old man was affected by facial localized vitiligo with no family history of this disease. After 17 months of treatment with conventional drugs with unsatisfactory results, the patient has adopted a new therapeutic protocol including topical application of a formulation of honey bee, *Allium cepa* L. juice and *Avena sativa* L. stem decoction. Also, a daily sun light exposure of 15-20mn was practiced.

**Results and discussion:** A complete re-pigmentation of white patches was obtained in a period of 11 months with no adverse effects. The prolactin value was 7.06 ng/ml and cortisol was 12.36 µg/dl with 17.14 g/l of sericIgG which reflect a stabilization of stress state of the patient.

**Conclusions:** The tested complementary therapy was safe and has successfully re-pigmented the different vitiligo lesions. Further studies are needed to confirm this stimulation of melanocyte's proliferative activity by the present formulation.

**Key words:** facial vitiligo, re-pigmentation, honey bee, *Allium cepa* L., *Avena sativa* L., sun light.

### INTRODUCTION

Vitiligo is a chronic, idiopathic, acquired pigmentary disorder which is characterized by depigmented patches in skin and mucous membranes<sup>1</sup> affecting about 1-4% of the world population<sup>2</sup>. This disease is known since antiquity because it has been mentioned on Papyrus Ebers 2500 years BC. It can be focal, segmental, generalized (vulgaris), or even universal<sup>3</sup>. Lesions are usually symmetrically distributed on the face, neck, axillae, elbows, knees, shins, and dorsal aspect of the hands and feet<sup>4</sup>. The psychological effects are an important aspect of this disease because vitiligo is often immediately visible to others resulting in social and emotional suffering consequences<sup>5</sup>. The exact etiopathogenesis of this melanocytes activity loss is unknown and several hypotheses were proposed viz autoimmune, cytotoxic, biochemical, oxidant-antioxidant, growth factor, viral, chronic pressure, neural and genetic theories<sup>6</sup>. If the diagnosis of vitiligo is regarded as being straightforward in many cases, although this is not always the case, its treatment is acknowledged as being difficult<sup>7</sup>. Medical therapies include phototherapy radiation (narrowband UVB), photochemotherapy, topical corticosteroids, topical calcineurin inhibitors, vitamines D3 analogues, excimer laser, and surgical procedures<sup>7-14</sup>.

In the present study, the author describes a self-case of facial vitiligo. After 17 months of treatment by conventional drugs, and in the objective to stimulate melanogenesis process, a natural formulation was tested including: honey bee, red onion juice and oat stem

decoction. The treatment protocol was completed by daily sun light exposure.



**Figure 1:** Schematic presentation of lesions localization in face and neck.

### CASE REPORT

A 34 –year- old man was suffering from localized vitiligo on the face and neck in November 2010. There was no family history of vitiligo. Any chronic disease has been diagnosed in the patient such as diabetes or thyroid dysfunction. This patient occupying a university teaching position, and he lived an interesting social pressure in the

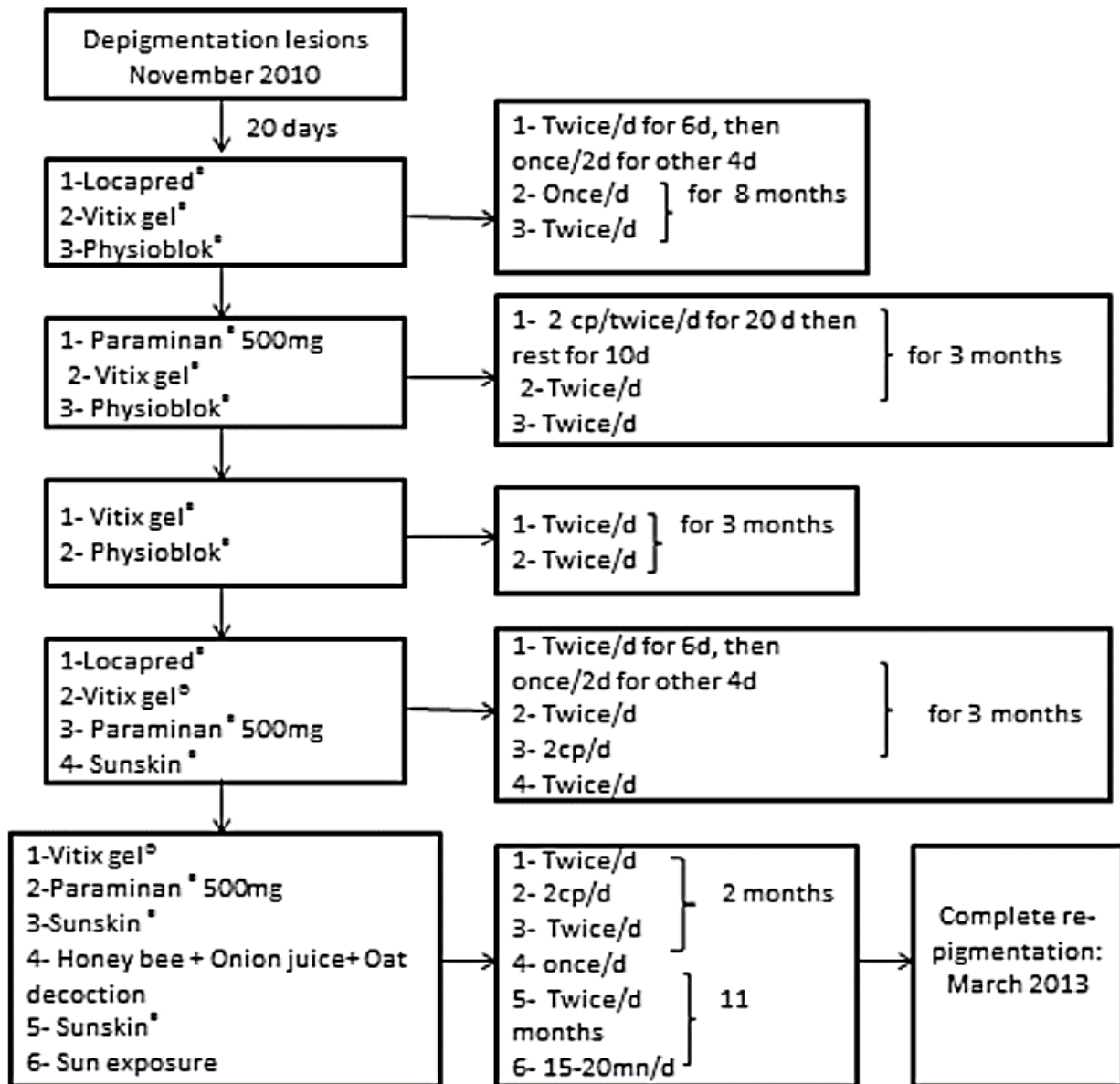


Figure 2: Treatment protocol

months preceding the appearance of the first lesions in the left cheek. At the peak of the disease evolution, the patient had lesions of de-pigmentation at the left cheek (the largest) and a smaller one at the right cheek. A rectangular white patches in both maxillae (left and right) and frontal lesions appeared later. In the end, seven months after the outbreak of de-pigmentation appeared two small spots at the neck (Fig. 1).

Twenty days after the outbreak of the first lesion, the patient has consulted a dermatologist which has diagnosed the disease and recommended a continuous application of some conventional drugs (Fig. 2). A treatment was started but the disease has continued to spread, giving other lesions. Noting that hair color (black) was preserved which suppose that a melanocyte's reservoir was preserved at these areas. After 8 months of treatment (Locapred®, Vitix® gel and physiblock®), the frontal lesion which has appeared after the start of treatment was re-pigmented

perfectly with appearance of some brown points at the left cheek, this development occurred during the months of May- June. Thereafter, in the following 3 months the frontal healed lesion has de-pigmented again and other small frontal spots appeared. At the end of the 17<sup>th</sup> month of medication with conventional drugs, a slight re-pigmentation was obtained especially in the two spots left and right cheeks, but the evolution has been very slow. It should also be noted that two small white spots appeared at the neck.

At the term of this period, and because of unsatisfactory results, the patient decided to adopt a natural remedy formed from honey bee, red onion juice and decoction of dry oat stems (10 g of stems were boiled in 150 ml of water for 12-15min). This natural mixture has been practiced every evening. Exposure to the sunlight for a period of 15-20mn/day was performed permanently in the sunny days (1h before midday). The natural remedy has been applied for a period of 20 days followed by 4 days off, so that sun



**Figure 3:** Evolution of frontal and cheek lesions.

exposure was permanent (except non-sunny days ) until complete re-pigmentation of all lesions. We mention that during the 28 months of disease, the patient has also applied the *Citrus lemon* fruit's juice, for a few times (limed use).

Table 1: Hemato-biochemical profile one month before complete re-pigmentation.

| Hematological profile                  | Values | Biochemical profile     | Values |
|--|--------|-------------------------|--------|
| Blood Red cells (10 <sup>12</sup> /l)  | 5.31   | Glycemia (g/l)          | 1.04   |
| Hemoglobin (g/dl)                      | 16.4   | Total proteins (mg/l)   | 67     |
| Hematocrit (%)                         | 51.8   | Urea (g/l)              | 0.26   |
| MCV (fl)                               | 97     | Cholesterol (g/l)       | 1.41   |
| MCH (pg)                               | 30.9   | Triglycerides (g/l)     | 1.44   |
| MCHC (g/dl)                            | 31.7   | HDL (g/l)               | 0.49   |
| Platelets (10 <sup>9</sup> /l)         | 231    | LDL (g/l)               | 0.63   |
| White blood cells (10 <sup>9</sup> /l) | 6.7    | TGO (g/l)               | 38     |
| Granulocytes (%)                       | 44.2   | TGP (g/l)               | 45     |
| Lymphocytes (%)                        | 46     | Ca <sup>++</sup> (mg/l) | 84     |
| Monocytes (%)                          | 9.8    | CRP                     | (-)    |
| SS: 1h                                 | 05     |                         |        |
| 2h                                     | 10     |                         |        |

During 9 months of application of the natural formulation under sun exposure, all the lesions were perfectly repigmented (Fig. 3). We mention that the white spots on the right cheek and that of maxillae (left and right) were repigmented one month before the great patch of the left cheek. Small brownish points appeared first in all depigmented surfaces at the same time and due to the growth of these, perfect re-pigmentation was installed. The large

frontal lesion showed a slow and centripetal re-pigmentation. This lesion, which was healed and depigmented again, scored a late re-pigmentation of 4 months compared to the great left cheek lesion. In the 2 small neck spots, which were treated only 5 months after the application of the natural mixture, treatment response was very quick and complete re-pigmentation took place only one month later.

Before complete healing (95% of re-pigmentation), a haemato-biochemical and hormonal assessment was performed to look for possible adverse effects from the application of different products and to control certain hormones reflecting the state of stress. The results have shown that all parameters were within the physiological range (Table1), confirming that after a period of 17 months of treatment with conventional drugs and 10 months of natural remedy application; there was no detectable physiological disturbance. The values of the prolactin and cortisol (Table 2) indicate a tendency for stabilization and less stress in the patient

Table 2: Prolactine, cortisol and IGg values

| Parameters         | Values |
|--------------------|--------|
| Prolactine (ng/ml) | 7.06   |
| Cortisol (µg/dl)   | 12.36  |
| IgG seric (g/l)    | 17.14  |

### DISCUSSION

In the present case there was no family history of vitiligo; the disease was occurred after a particular stress conditions happened in the patient's life. He was safe from chronically disease ordinarily implicated in this disease as diabetes and thyroid dysfunction. Only the frontal patch was visibly responded positively to conventional drugs after several months of treatment. However, the lesion was reappeared with other small lesions. We mention here that the patient was strongly psychologically affected which

may affect negatively the physiological response to drugs. After 17 months, the disease seemed to be stabilized but also the re-pigmentation process was very slow. The application of the natural formulation has resulted in complete re-pigmentation with no adverse effects.

It has been reported by Kahraman et al.<sup>15</sup> that honey contains approximately 80% carbohydrates (40% fructose, 35% glucose, and 5% sucrose) and 20% water. In addition, it contains more than 180 substances, including amino acids, vitamins, minerals, enzymes, organic acids and phenolic compounds. This natural complex has been shown to possess antimicrobial, antiviral, anti-parasitary, anti-inflammatory, antioxidant, anti-mutagenic and antitumor effects<sup>16</sup>. The honey bee from Algerian country has been reported to possess high antioxidant potential<sup>17</sup> and know a large implication in Algerian traditional medicine as cicatrizing agent used alone or in combination<sup>18</sup>.

Green oats contain mainly pectin and SiO<sub>2</sub>, esters with polyphenols and mono- or oligosaccharides<sup>19</sup>. The chemical composition of the dry stems of *Avena sativa* L. is not documented for our knowledge. Traditionally, the oat was used as a remedy in different therapeutic areas: Sedative, external use (cutaneous disorders), nervous system, and endocrinology, gastrointestinal, respiratory and urinary tracts and also for general condition<sup>19</sup>. Several studies have focused the evaluation of *A. sativa* L. pharmacological properties, among them topical anti-inflammatory activity. Aries et al.<sup>20</sup> has reported that colloidal extract of *A. sativa* L. stimulated the production of the anti-inflammatory TGFβ1 by keratinocytes and inhibited the production of interleukins. In addition to this, Aries et al.<sup>21, 22</sup> have founded an inhibition by colloidal extract of *A. sativa* L. of Ca-ionophore A23187 on the liberation of arachidonic acid from phospholipids and the subsequent metabolism into prostaglandins and leukotriene. The expression of phospholipase and COX2 was tempered. In a study of Boisnic et al.<sup>23</sup>, treatment with oatmeal extract oligomer has decreased significantly skin inflammation with decrease of TNF-alpha. Avena flour preparation has inhibited the expression of Nitric oxide synthase which appears when neuro-immunocutaneous system is destabilized during cutaneous inflammation<sup>24</sup>. In experimental wound healing model, this *Avena* flour preparation has induced the expression of VEGF by keratinocytes and has increased keratinocytes migration and collagen fibercontraction<sup>25</sup>. A study of Liu et al.<sup>26</sup> has shown that oat avenanthramides, phenolic antioxidants present in oat, exhibit a high capacity to inhibit adhesive interaction between endothelial cells through inhibition of adhesion molecule expression and to inhibit pro-inflammatory cytokines and chemokines. The authors concluded that their data provide evidence for the anti-inflammatory potential and anti-atherogenic effects of oat avenanthramides antioxidants.

*Allium cepa* L. (*Alliaceae* family) has a long history of medicinal use. The Sulfur- and non-sulfur-containing components have been isolated from bulbous of this plant; the organic sulfur compounds include the thiosulfonates, thiosulfonates, cepaenes, S-oxides, S,S-dioxides,

monosulfides, disulfides, trisulfides, and zwiebelanes<sup>27</sup>. European Medicines Agency (EMA) has published an assessment report about *A. cepa* L. bulbs, a lot of pharmacological properties of this plant were reviewed and discussed (Anti-allergic / allergic, anti-inflammatory, antimicrobial, antifungal, antiprotozoal, anti-nematocidal, anti-carcinogenic and anti-mutagenic, anti-hyperglycemic, anti-aggregatory, cardiovascular and lipid-lowering effects, neuroprotective and effects on skin)<sup>28</sup>. According to a study of Arunget al.<sup>29</sup>, the dried skin extract of this plant inhibited melanin formation in B16 melanoma cells in dose dependent manner. In contrast, the extract of the flesh of the onion did not lead to melanin inhibition. However, an opposite result was reported by Kubo et al.<sup>30</sup> previously. According to these authors, quercetin of onion enhanced the total melanin content in B16 melanoma cells. A study of Khalifa and Al-Obaidi<sup>31</sup> has shown a highly therapeutic effect of crude onion juice in the treatment of patchy alopecia areata by topical application. In a study of Al Masaudi & AlBureikan<sup>32</sup>, when testing the effects of the onion- honey mixture with different concentrations (v/v: 1/1, 1/4, 4/1), the authors have found that the mixture (1/1) had a very noticeable effect on all species of examined microbes. Their data has also shown that the tested mixture was significantly more effective comparing with onion or honey alone.

In view of these literature reports, we can affirm that the present formulation is very rich in antioxidant components with anti-inflammatory activity. The inhibition of pro inflammatory cytokines and chemokines by some molecules as avenanthramides, and the total melanin enhancement by other components as quercetin were scientifically accepted. Furthermore, the formulation is a good source of nutritional elements to nourish the damaged skin. In addition, the sun light role in the stimulation of melanogenesis process was well investigated. In a study published in 2003, three vitiligo cases were treated successfully (follow-up of 6 to 9 months) with twice topical application of 0.1% Tacrolimus ointment. These patients were allowed unprotected (no sunscreen) natural sunlight exposure at midday: 5 minutes in the summer and 10 minutes in fall, winter, and spring<sup>33</sup>. Finally, a synergic effect between the honey bee, *A. cepa* juice and *A. sativa* decoction (v/v/v: 1/1/1) is possible in term of melanogenesis stimulation. As a limitation for the current study, we mention that the evaluation of re-pigmentation process, during disease evolution, adopted non-quantitative visual examination and the interpretation of each natural product's role remains difficult.

## CONCLUSION

In summary, a facial localized vitiligo case was followed-up. After 17 month of conventional treatment with unsatisfactory results, a new therapeutic protocol was tested. A formulation of honey bee, *Allium cepa* L. juice and *Avena sativa* stem decoction was applied topically each evening. Also, a daily sun light exposure was practiced. A complete re-pigmentation had taken place during 11 months of remediation with any adverse effects. Further studies are recommended with large number of



patients to confirm the efficacy of this treatment protocol in the management of localized vitiligo.

**CONFLICT OF INTEREST:** None

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