



## Prevention and Treatment of Vitiligo

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**Abstract:** Vitiligo is a common, acquired, disorder of depigmentation resulting from the destruction of melanocytes in the epidermis, characterized by ivory or chalky white macules and patches. Researchers suggested that vitiligo may arise from autoimmune (AI), genetic, oxidative stress or neural causes. Repigmentation modalities either replace melanocytes in the vitiliginous skin via surgical procedures or enhance the regenerative potential of existing melanocytes. Vitiligo requires not only a deposition of pigment in the areas of depigmentation, but it also requires a redistribution of pigment from hyper pigmented borders, Catalase is well known antioxidant enzyme, which prevents cell damage from highly reactive oxygen species. The PDGFRA protein is involved in melanogenesis. Avoid skin damage, skin abrasions, burns and wounds where the pigment cells were destroyed but not replenished, often found in sun-exposed skin, avoiding prolonged exposure to sun light using sunscreens. Improve nutrition and diet, vitamins and minerals, play an important role in the production of melanin in the skin. Turmeric along with mustard oil stimulate the pigmentation of the skin. Based on the above study it can be concluded that Vitiligo is a skin disorder which has both psychological as well physiological effects on human. In this review we discuss about prevention and treatment of vitiligo.

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### **Introduction:**

Vitiligo is one of a common skin disease which affects people of all background and genders. It is characterized by the loss of the melanocytes from the epidermis as well as epidermal appendages resulting the depigmentation in skin area. [1]

This condition leads to irregular white spots or patches all over the skin. Vitiligo affects at any age mainly early twenty's.



[2]

It is a hypomelanotic skin disorder among 0.1 to 0.2% of human worldwide. In this disease both physiological as well as psychological effects are influenced due to social perception and irregularities of skin color. [3]

### **Materials and methods:**

Study:

There are many researches in this Vitiligo disease which suggested that it arises from different factors like autoimmune, genetic, oxidative stress or neuronal causes. Many genes like catalases (CAT) gene, platelet-derived growth factor receptoralpha (PDGFRA) gene and estrogen receptor (ESR) 1 gene.

CAT gene is responsible for the catalase enzyme activity .The catalase is an enzyme which shows an antioxidant property which prevents the damage of cell and helps in melanogenesis. Due to mutation of CAT gene catalase activity decreases and leads to this disease. [4].

PDGFRA gene is a proto-oncogene, located on chromosome 4q12.The PDGFRA protein is involved in several cellular and tissue processes, such as proliferation, apoptosis, chemo taxis,

melanogenesis, hematopoiesis and gametogenesis. The changes in PDGFRFA gene responsible for familial Vitiligo. [5]

Many others gene are also responsible for this skin disease known as Vitiligo.

Preventive measures:

There are many herbal drugs are used to cure Vitiligo which is described below-

### ***Gingko biloba***

Gingko is one of the oldest tree of earth. The extract of Gingko effective in different diseases. In Vitiligo, the drug is formulated in tablet forms mainly. The mechanism to cure in Vitiligo is still unknown but it may shows the anti-inflammatory, immunomodulatory and antioxidant properties of the drugs. [6]

### ***Cucumismelo***

It is also known as Muskmelon, comes under the Cucurbitaceae family. The extract of *Cucumismelo* is rich in antioxidants due to high superoxide dismutase (SOD) activity. *Cucumismelo* extract shows its activity by inhibiting the destruction of melanocytes cells by oxidative stress and ultimately stops the first step of Vitiligo. [7,8]

### ***Ammi visnaga***

Khellin is a naturally occurring furanochromone, derived from the plant *Ammi visnaga*. This khellin is introduced in medicine for the treatment of vitiligo by s by stimulating melanocytes proliferation and melanogenesis .It can be administrated both systemically (oral administration) and topically. [9]

### **Green Tea**

Green tea contains polyphenols group, which are used as a medicine for Vitiligo treatment. It act as a as anti - inflammatory, anti - oxidant, and immunomodulatory agents, mainly because of

their composition in Epigallocatechin – 3 - gallate (EGCG). This drug also given as systemically and topically. Green tea gives its action by arresting the oxidative stress of melanocyte cells. [10]

### *Curcuma longa*

*Curcuma longa* is commonly known as the golden spice turmeric. The main constituent of turmeric is curcumin, is a polyphenol compound. Curcumin shows a varieties of activities like antioxidant, anti - proliferative, anti - inflammatory, antiviral, antibacterial and antifungal. So, it is used in treatment of various diseases.

Recently, a tetrahydrocurcumide cream has been used in association with nb - UVB for vitiligo treatments. The phototherapy was performed twice a week for 12 weeks. At the end of the period the repigmentation on the affected skin is shown. This also given orally as an adjuvant therapy in vitiligo patients. [11]

### **Treatment methods:**

Etiology of the Vitiligo is still unknown. But it is believe that it involves some theories like cytotoxicity, triggering, neural, free radicals genetic Auto immunity. It can be treated by surgical oral or topical formulations of the drug alone in mild cases but in severe case of Vitiligo Light therapy is also given with the consumption of medication to increase the pigmentation of the skin. The treatment of leukoderma or Vitiligo requires not only a deposition of pigment in the areas of depigmentation, but it also requires a redistribution of pigment from hyper pigmented borders, so that the result will be an even distribution of the normal amount of cutaneous colouring. It also depends on the presence of the type of the cell. Possibility of formation of melanocyte in inter-follicular epidermis is decreased by the presence of keratinocyte stem cells in the similar location. [12]

### Repigmentation therapy:

For this Vitiligo, 80% of treatment is done by this regimentation therapy. This can be done by two ways either by replacing melanocytes in the vitiliginous skin via surgical procedures or by increasing the regeneration of melanocytes cells. Firstly it starts with inhibiting the destruction of the existed melanocytes cell in the skin which helps to prevent further loss of melanocytes from skin. During the treatment precaution is taken that is to avoid a chronic mechanical friction (by fingertips, perioral area) in the affected portion of the skin.

This treatment starts by different morphological pattern like perifollicular, diffuse, marginal and medium spotted. The perifollicular pattern initiate's from the proliferation and migration of the melanocytic stem cells located in outer root sheath of hair follicles to the epidermis. The melanocyte stem cells are present in hair follicles which act as immune privileged. The stem cells are migrated from the hair follicles in the presence of matrix metalloproteinase (MMP).MMP activity shows by presence of transcription factors Ets-1 and others. The basal levels of Ets-1, MMP-2 and MMP-9 are reduced and leads to Vitiligo.Dermapen, fractional carbon dioxide laser and 25% trichloroacetic acid (TCA) helps in inducing repigmentation in depigmented patches of affected skin in Vitiligo. [13, 14]

#### Topical Therapy:

It is the second approach in Vitiligo treatment by the topical application in the affected area. For this generally topical steroids like corticosteroids are used. This helps in a widespread skin condition with less adverse effects. Analysis shown that terribly potent or potent (Class one and sophistication 2) topical corticosteroids will be used on a short basis to the re-pigment Vitiligo affected skin in adults. But in youngster less potent topical steroids are used for the treatment. [15]

#### Oral Therapy:

This therapy helps to stabilize the skin condition by inhibiting the formation of new spots in skin due to the loss of melanocytes which is done by oral steroids. It can prescribed in pulse dosing for a week. Oral steroids will cause several facet effects like increasing glucose, increasing pressure level, and weakening the bones. As such, watching is needed once taking this medication. [16]

#### Phototherapy:

PUVA stands for Psoralen and Ultraviolet a lightweight which is consists of oral intake of a photosensitizer psoralen followed by exposure to photo activating UVA light (320- 400 nm) and performed 2-3 times in a week. The aim of this therapy is repigmentation in the Vitiligo patient. It can performed only in adult due to several contradiction. [17]

**Result:**From recent study and research investigation vitiligo is one of most common disorder generally characterized by white patches on the skin.it is a result of depigmentation or loss of melanocytes from the skin.it can be cure or prevented if we take care of our skin,avoid direct contact with harmful radiation sun burn etc. Researchers suggested that it may be auto immune cytotoxic and genetic disorder. In recently many researchers discovered many drugs for the treatment of this disease.but these treatment require longer duration and so patient must keep patience and continue their treatment to get rid of this disease.

**Discussion:** As we know vitiligo is one of disease characterized by the white patches,or loss of melanocytes or depigmented skin.we know little about the autoimmune and genetic nature of vitiligo. So many studies has been done to identify the clustering and susceptibility gene and immune system involved in the vitiligo. In the recent year, study of vitiligo for genetic modelingwere conducted in the India and united state.it is found that an autosomal recessive gene is responsible for vitiligo and control by 3 or 4 loci. However in this study clinical features of patients were unknown. The main aim of this paper is to give awareness and prevention measures and also treatment for the vitiligo patients. There are many preventive methods discussed above and also some treatment to cure disease. There are the genes from recent studies can cure if they are altered according to need of their action.Catalase (CAT) gene, Catalase is well known antioxidant enzyme, which prevents cell damage from highly reactive oxygen species (ROS).Platelet-derived growth factor receptor alpha (PDGFRA) gene,The PDGFRA protein is involved in melanogenesis.Estrogen receptor (ESR) 1 gene. [18, 19]

Associated with increase in skin pigmentation and prevent destruction of melanocyte pigments.Avoid skin damage, skin abrasions, burns and wounds where the pigment cells were destroyed but not replenished, often found in sun-exposed skin, avoiding prolonged exposure to sun light using sunscreens.Improve nutrition and diet, vitamins and minerals, play an important role in the production of melanin in the skin. Avoid stressful situations, Stress,either emotional or physical is one of factors to the faster progression of this disease.By avoiding events or instances that may cause stress, you can minimize or slow down the spread of your vitiligo patches.Turmeric is an effective home remedy for vitiligo, Turmeric along with mustard oil and stimulate the pigmentation of the skin. The treatment discussed above are available for vitiligo, but some time treatment are not as much as effective as it requires longer duration with continue

therapy and hence patients get frustrated and they do not maintain regularity. And also do not take proper prevention or precaution which must needed to avoid vitiligo.some time drugs produces side effects like gastric discomfort, sunburn,itching nausea etc. [20 ,21]

**Conclusion:** From this preliminary study investigation and research, it has been concluded that Vitiligo is a skin disorder of depigmentation resulting from the destruction of melanocytes in the epidermis, characterized by ivory or chalky white macules and patches. Researchers suggested that vitiligo may arise from autoimmune (AI), genetic, oxidative stress or neural causes, which has both psychological as well physiological effects on human.The above discussed preventive measures and treatments are available to treat or cure this disease.but Some problems are also arises during the treatment.so some solutions are also discussed in above article.As above discussed treatment it requires a longer duration and their slow effect and some additional symptoms patients get frustrated and discontinue the treatment.So to avoid such things or to resolve this problem patient counselling should be carried out.

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