International Journal of Pharmacy and Herbal Technology

e-ISSN: 2583-8962 Vol. 2, Issue 4 (October – December, 2024) pp: (3052-3071)

Vitiligo: A Review of Pathogenesis, Diagnosis & Treatments

Amruta P. Disale *, Sanjay K. Bais

Fabtech College of Pharmacy, Sangola, Solapur, Maharashtra, India

*Corresponding Author: amrutapd20@gmail.com

Received Date: November 29, 2024; Published Date: 31 December,2024

Abstract

"Vitiligo" is a chronic autoimmune cutaneous condition that are defined by a slow degradation of melanocytes, causing skin depigmentation in certain areas. Despite its frequency the one that actual the reason behind vitiligo is unknown, with a complex interaction of genetic, environmental, and immunological variables. This review focuses into the current understanding of vitiligo, concentrating on its pathophysiology, hereditary predisposition, and immune system involvement. Furthermore, we study the disease's psychological effects, as well as developing treatment alternatives such as immunomodulators, phototherapy, and innovative regenerative therapies aimed at repigmentation. Recent advances in research have provided fresh insights into targeted therapeutics, yet there are still hurdles in fully understanding the reasons and developing successful long-term treatments. This article tries to consolidate recent results to improve our understanding of vitiligo and guide future study.This article seeks to integrate recent discoveries in order to increase our knowledge about vitiligo and guide future research and therapeutic management techniques.

Keywords - Vitiligo, Pathogenesis, Treatments, Management, Traditional Remedies

INTRODUCTION

A pigmentation disease called vitiligo causes the skin's pigmentation cells, or melanocytes, to be destroyed. This leaves smooth, white patches in the middle of skin that is ordinarily pigmented. The vitiligo which had a frequency of 0.06-2.28% across the world in 2012. The lack of the skin's pigment, which results from death among melanocytes, is its primary characteristic. Melanocytes resides in the skin, hair follicles, the nervous system, heart, bones, and inner ear, among other tissues. The primary job of the epidermal unit is composed of nearby in the basal layer of the epidermis, keratinocytes and melanocytes are to create is disseminate melanin by using a complicated a procedure called melanogenesis. Two types of melanin exist: "Red/yellow pheomelanin and eumelanin (brown or black)". It provides photoprotection due to its light-absorbing qualities. Although several intrinsic and extrinsic variables influence melanogenesis, it is primarily governed by genetics. Surrounding cells such as keratinocytes, fibroblasts, inflammatory, neural, and endocrine cells release the intrinsic factors. Among the extrinsic influences are medicines and UV radiation. UV light, the melanocortin 1 receptor Pigment precursors "L-tyrosine" and "L-DOPA" among others, are melanogenesis inducers as well as positive regulators. It is believed that the latter is the most significant positive regulator [1].

A skin disease that causes loss of pigment 'Vitiligo' can be distinguished by the selective melanocyte loss, which causes the pigment in the afflicted areas of the skin to become diluted. In most cases, the macule is chalky-white, nonscaly, and entirely amelanotic with distinct borders.

Recent years have seen a substantial advancement in our knowledge of the pathophysiology of vitiligo, and it is currently clearly characterized as a condition that is autoimmune that is linked which is oxidative stress, metabolic imbalances, genetic, and environmental factors. Because vitiligo can have mentally life-threatening effects and seriously disrupt day-to-day it is important to avoid dismissing it as a mild disease or cosmetic condition [2].

Vitiligo that is segmental (SV) and nonsegmental (NSV) were recognized by an international consensus as the two primary types of vitiligo in 2011. Every type of NSV, such as mucosal, acrofacial, generalized, universal, mixed, and unusual varieties, were categorized as vitiligo. Because of the predictive consequences, one of the most important results of the agreement was to distinguish SV from other types of vitiligo [3]

Clinical Vitiligo

When vitiligo was first mentioned in Egyptian and Indian scriptures 3,500 years ago, the social shame attached to this deformity was already apparent. Both the Egyptian Ebers Papyrus (1500 bce) and the book of Leviticus in the Hebrew Bible from around the same period mention white spots on the skin, as does the Atharvaveda, an ancient work composed in India between 1500 and 1000 bce. It is "abhorred" in Indian literature for a son or daughter to marry someone who has these white patches. Men and women with vitiligo were not suitable for ordainment, according to early Buddhist literature, and Hindu writings imply that people with this condition may have stolen clothing in their past lives.

Melanocyte loss that is specific to a depigmenting skin disorder that results in the damaged skin areas losing color. An entirely Typically, an amelanotic, nonscaly, chalky-white macule with distinct borders condition. Our knowledge which is currently growing in terms of the vitiligo etiology, and it is currently categorized in a clear manner. as an inflammatory condition linked to both genetic and environmental along with cellular oxidation and metabolic atypical cell detachment and stress. Don't write off vitiligo as a minor or cosmetic condition because it can have very detrimental psychological implications. have a significant impact on day-to-day living. An international consensus categorized vitiligo in 2011. Consist two primary forms: vitiligo Nonsegmental (NSV) and SV, or Segmental vitiligo. It was characterized how vitiligo was. may refer to any type of NSV, such as acrofacial, mucosal, variations (universal, mixed, un common, generalized).

One of the difficulties was differentiating vitiligo from other types. What's consensus's most significant choices, mostly due to its consequences for prognosis. Patchy skin depigmentation on every part of the human body can be a defining feature of vitiligo. Its prevalence does not vary significantly by elements like gender, ethnicity, or geographical region, or it affects about one percent of the global population. Just like the past, Patients' quality of life is negatively impacted by vitiligo by lowering their sense of self and having serious psychological discomfort [4]. This decline in terms of life quality is similar that of another debilitating The skin conditions. like psoriasis and dermatitis. The visible symptoms of vitiligo involve spots on the skin that lead to Depression, anxiety, and humiliation. Visible areas like the hands and cheeks are frequently impacted. and patients frequently have a particular concern of their illness spreading and getting worse at these places.[5].

Figure 1*: *Vitiligo Patches

Historical Background

The Latin word from which the word "vitiligo" is derived "vitilus". Celsus, an ancient Roman doctorIn the first century A.D., the term was created. As he claims, the disease has white spots similar to a spotted calf's white patches. Vitiligo is a old illness referenced in religion literature that the “Holy Quran”, “Vedas”, and “Bible”. A condition is even referred to as "Bai Dian Feng" in traditional Chinese medicine. Ancient Egyptians wrote about an illness that is thought to resemble vitiligo, according to an excerpt from the Ebers Papyrus medical text from around 1500 BC. This description persisted after it was translated into Greek, causing people with vitiligo to continue to be confused with leprosy and spiritual uncleanliness. Hippocrates and other ancient medical texts frequently combined vitiligo and leprosy together, failing to distinguish between the two conditions. Aulus Cornelius Celsus, a Roman physician, used word "vitiligo" within his famous De Medicina: A Medical Thesis.[6]

Classification

Not segmented

Usually, there's some symmetry in the placement of the depigmentation patches in non-segmental vitiligo (NSV). Over time, more patches may also develop; they may be limited to a specific place or extend throughout significant areas of the body. Vitiligo universalis is the term for severe vitiligo situations when very little pigmented skin is left. Comparatively speaking, segmental vitiligo is far more prevalent in teenagers, NSV can occur at any age.

The following are classes of non-segmental vitiligo:

Focused vitiligo: one or a few dispersed macules in one location, most common in youngsters;

universal vitiligo: depigmentation covers the majority of the body; generalized vitiligo: the most prevalent pattern, vast and randomly distributed areas of depigmentation

Vitiligo acrofacial: fingers and periorificial areas

Only the mucous membranes become depigmented in mucosal vitiligo.[7]

Sectional

The appearance, etiology, and rate of associated disorders vary across cases with segmental vitiligo (SV). It is not treated the same way as NSV. It is usually unilateral and tends to affect skin regions related to the dorsal roots of the spinal cord.Compared to global vitiligo, it appears to have a lower relationship with autoimmune illnesses and a considerably more steady and static history. Topical medications and UV radiation do not help SV; However cellular grafting and other surgical techniques can be effective.

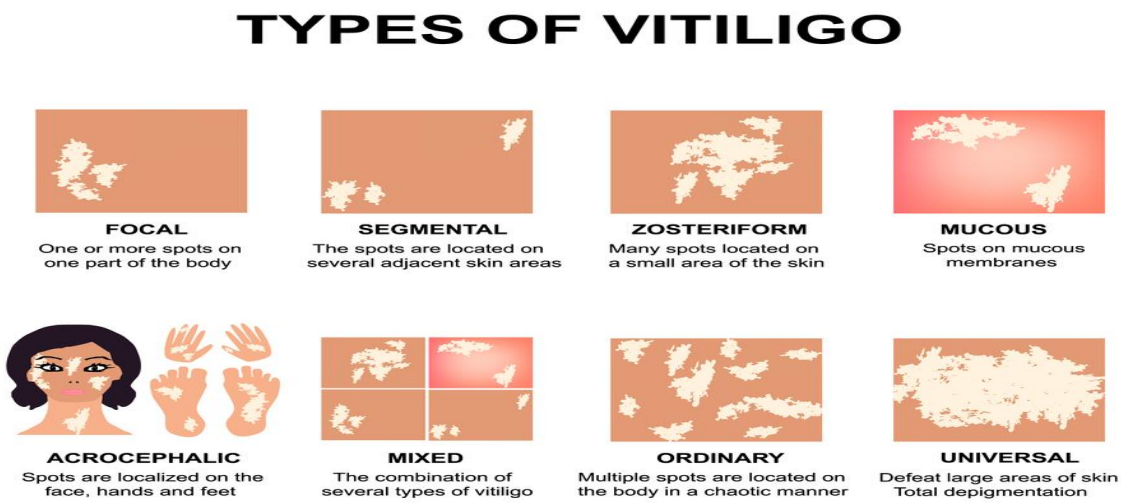

***Figure 2*:** *Types of Vitiligo*

Etiology

Anti-melanocyte antibodies common correlations with other auto-immune diseases such thyroiditis and type I diabetes, and a reaction to immunosuppressive treatment are all signs of auto-immunity.

Cytotoxicity is the potential for melanocytes to be destroyed by metabolites produced during melanin production.

Neural chemical mediators may either kill melanocytes or prevent the synthesis of melanin when they are released at nerve ends.

Genetic A person's susceptibility to vitiligo seems to be caused by a number of genes, including NALP [8]

Triggering

The breakdown of the pigment cells seems to be triggered by an event. There are numerous hypothesized causes for vitiligo, and they might not apply to every case (e.g., sunlight, trauma, pregnancy, etc.).[9]

Diagnosis

Vitiligo is diagnosed clinically by identifying Macules that are chalky-white and nonscaly specific characteristics. A typical distribution of margins includes the penis, segmental, lips, tips of the distal extremities, periorificial, and areas of friction. “Vitiligo” is frequently diagnosed without the need for confirmation lab examinations.

Dermal Examination

A little piece of skin is collected then analyzed under a microscope to look for any missing melanocytes.Skin biopsy or other testing are only essential to rule out other conditions. The lack of the lesion's melanocytes can be determined.

The Wood's Lamp

A black light makes damaged portions of skin look chalky and brilliant. A Wood's lamp, that emits UVA, can help identify vitiligo.[10]

Eye Exam

An inflammation of the eye that can occasionally occur with vitiligo.

Physical Examination

The dermatologist will do a full physical checkup to establish whether you have vitiligo and, if so, which kind. Visually, he or she analyse your entire body, taking note of where appearance of depigmentation, whether patches form across one or both body sides, proportionally or randomly. Suppose you have extremely equitable skin, It might be difficult for discern DE pigmented spots brought on by vitiligo. Completely depigmented area of the skin shows differently under UV radiation than unaffected skin.

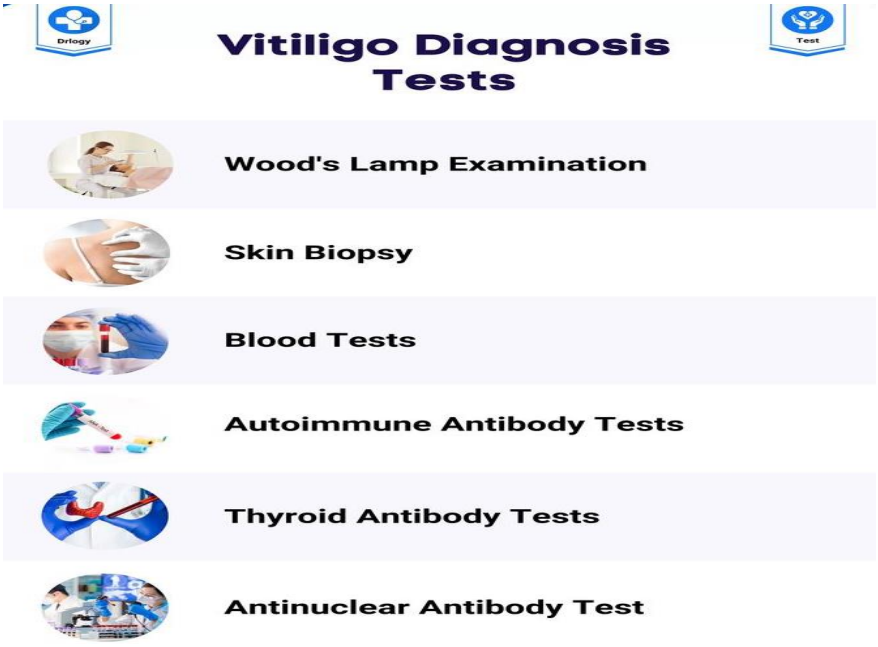

***Figure 3**: Diagnosis of Vitiligo*

Symptoms

Vitiligo Symptoms consist of:

The disappearance of skin patches pigment, have generally starts on the hands, face, and other places close to body openings, such as the genitalia.

Early whitening or graying of hair on the brows, beard, eyelashes, and scalp

Mucous membranes are tissues that encircle the inside of the nose and mouth change the color. The tissues that have mucous membranes border the inside of the nose and mouth, change the color.[11]

Although vitiligo can develop at any age, it usually manifests before the age of thirty.It could affects:

Almost every surface of the skin

This type of vitiligo, called universal vitiligo, darkens almost every part of the skin.

A number of body parts

A single side or area of the body

A single or small number of body parts

Face and hands

Causes [12]

Vitiligo arises When the cells that produce melanin (melanocytes) die or stop making it, the pigment that produces color of Your eyes, skin, and hair. An affected regions of skin becomes

white or lighter. It is unclear which causes the pigment cells to fail and die. Which might connect:

An illness of the immunological system

The history of the family

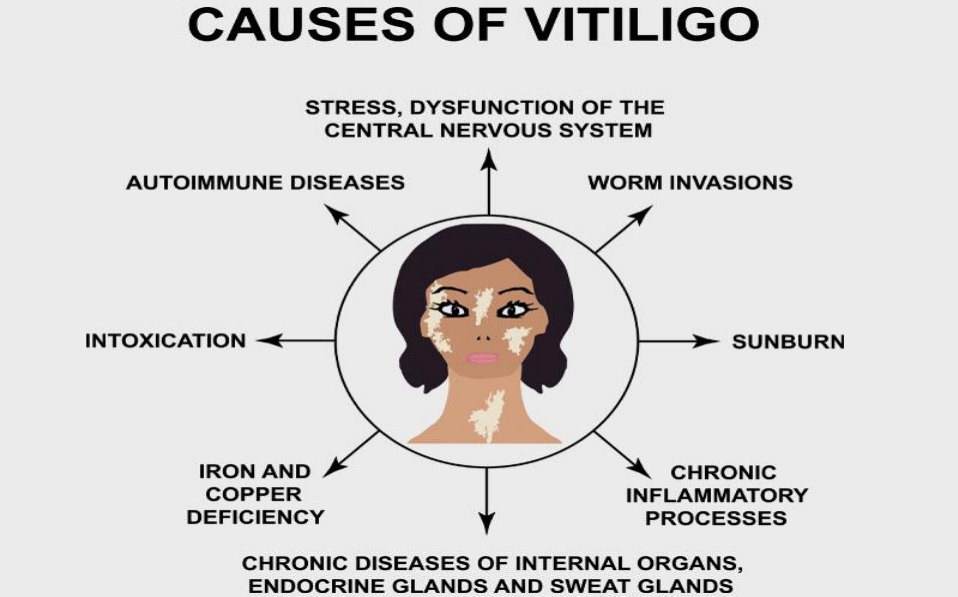

***Figure 4*:** *Causes of Vitiligo*

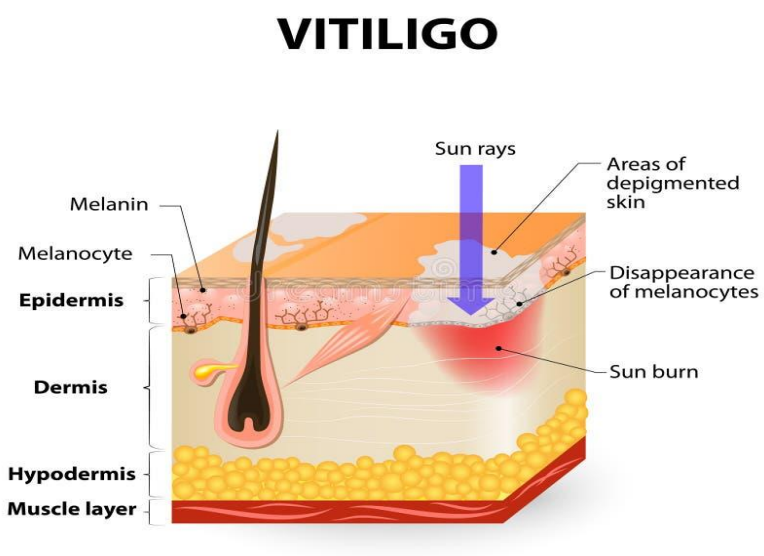

***Figure 5*:** *Vitiligo*

Treatments For Vitiligo

Despite the fact that vitiligo has no known cure, there are several therapies that can be used.

The most compelling data support the use of creams in conjunction with UV radiation and applied steroids. The National Health Service of the United Kingdom advises against using phototherapy unless all other therapies have failed because of the elevated risk of skin cancer.Because facial skin is thinner than other skin types, lesions Repigmentation is more difficult on the hands, feet, and joints. On which other hand, lesions on the face are the easiest.[13]

Traditional Remedies for Treatments of Vitiligo

Red clay

Commonly applied for white spots, red clay is found on drops and around rivers. Once a day, apply a mixture of clay and ginger juice on the white patches. There is copper in the clay. As a milk stimulant, ginger juice increases blood flow to the spots and seems to restore skin pigmentation.[14]

Paste made with radish seeds

Radish seed paste can help treat white patches on skin. To apply, grind approximately 35 grams of these seeds in vinegar. There are white patches. To achieve better results, seeds should finely ground, combined with a small amount of overnight in vinegar, and steeped in white arsenic. After the leaves have developed, around two hours, rub them on the white patches.[15]

Turmeric and mustard oil

Turmeric and mustard oil can help treat white patches. Crashed approximately 500 grams of turmeric immersed in 8 kilograms of water overnight. It needs to be cooked in the morning until there is barely a kilogram of water remaining. 500 grams of mustard oil should be added once it has been pressed. Heat the mixture. Until the oil is all that remains. Use it every morning and night for a few months to treat white spots [16].

Homeopathic Remedies

Yoga Therapy

Yoga therapy is helpful in the treatment of vitiligo

Figure 6*: *Yoga Therapy

Treatments Of Vitiligo

Phototherapy

Using narrow-band UVB phototherapy radiation is high potent radiation and can cause a variety of systemic effects, including immunosuppressive and opioidogenic effects, as well as Proopiomelanocortin pathway activation in the hypothalamic arcuate nucleus and the central hypothalamic-pituitary-adrenal axis. [17]

The following are some benefits of narrow-band UVB versus oral PUVVA therapy:

Reduced treatment duration

No systemic side effects because oral medications are not necessary

Less fire occurrences

No requirement for post-treatment ocular photoprotection and permitted usage in young people and expectant mothers' nannies and nursing mothers

Surgery

Goal

Skin color restoration

Surgery could be an option if alternative procedures are unable to restore skin color. Treatment for vitiligo involves two types of surgery

Skin grefting

Cell Transplant

Skin graft

To treat one or more vitiligo-affected places, your dermatological surgeon will remove a portion of healthy, pigmented skin and transplant it there. One part of the body's healthy skin is taken out and transplanted, or transferred. Healthy skin replaces or covers damaged or absent skin. Skin damage or loss can result from infections, burns, wounds, or diseases.

The following are the several kinds of skin graft surgeries:

Split-thickness skin graft (STSG)

In this treatment, your physician removes only a portion of the dermis and the outermost layer of skin (epidermis). Typically, STSG is used by providers to cover large sections of missing or damaged skin. Usually, they remove healthy skin from the back, abdomen, bottom, or thighs. The donor skin area often heals on its own in a period of one to two weeks.

Full-thickness skin graft (FTSG)

In a FTSG, the top layer of skin as well as the complete second layer are removed and transplanted by your physician. Because the transplanted skin is thicker than the native skin, FTSG operations take longer to heal than STSG. Providers may decide to use FTSG for the face is one of the bodily parts that are typically uncovered by clothing. In order to do FTSG, medical professionals frequently remove healthy skin from the arm, collarbone, or groin area and immediately seal the donor site.

Composite graft

In this process, soft tissues such as cartilage are transplanted along with skin. Composite grafts can be used to repair damage to the ears, nose, and fingertips.

Cell transplant

A portion of your dermatologist's healthy, pigmented skin is removed during this kind of procedure. The surgeon uses skin cells from the extracted skin to restore lost skin instead than grafting fresh skin into the damaged area. These cells are then applied to the skin that has vitiligo.

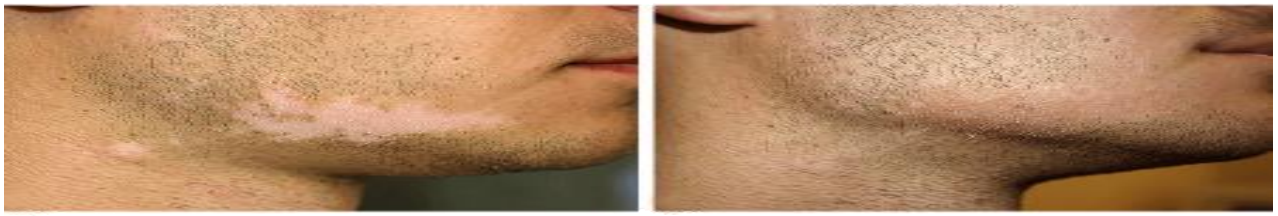

Figure 7*: *Cell transplant

Within six months following surgery, the majority of re-pigmentation from these cells occurs. Dermatologists have observed patients repigment for as long as a year, though. People with various forms of vitiligo and skin tones may consider surgery as a treatment option. It's not an acceptable option for everyone, though. Generally speaking, individuals with active vitiligo those whose patches have grown or formed during the past year should not have surgery. Moreover, those with increased scars might not be able to have surgery. Scarring may result from surgery.

Skin coloring, self-tanner, and makeup

Goal: Immediately achieve skin tone parity. The effects of treatment take time to manifest. Your dermatologist could advise you to use one of these products to help balance out your skin tone until you see benefits.

Cosmetics for hiding

Self-tanning lotion

Skin pigments

Patients who choose not to treat their vitiligo may also choose to use them. Ask your dermatologist for a recommendation if you'd like to try these products. A product that complements your skin tone and lasts the entire day can be suggested by your dermatologist. Self-tanning products usually provide you coverage for three to five days and are waterproof. Although waterproof and lightweight, camouflage makeup requires daily application.

Supplements and diet for vitiligo

Goal

To replenish your body's deficient nutrients

You can get back to your original skin tone with specific vitamins, minerals, amino acids, or enzymes. Scientists are investigating the potential impact of these on vitiligo. To find out if any diet or supplements may effectively treat vitiligo, more research is required.

Depigmentation

Goal

Get rid of any leftover skin color rarely is depigmentation done

This option is only available to people who have largely lost their natural skin tone and decide against pursuing skin-color restoration procedures. Depigmentation evens out the skin tone by removing the last of the natural pigment. A patient applies a lotion to the parts of skin that still have pigment to get remove of the remaining color. The remaining colour is eventually eliminated by the cream. To remove any leftover pigment, it may take a year or more. Consult a board-certified dermatologist about the advantages and disadvantages of depigmentation if you're thinking about taking this course of action. This course of treatment is thought to be ongoing.

Laser treatment

For focused phototherapy, 308 nm wavelength EL excimer light in excimer lamps and EL is helpful.The mechanism of action involves stimulating melanocyte migration and proliferation in hair follicles and directly cytotoxically affecting T lymphocytes.[18]

Herbs And Nutrition's for Vitiligo

A overview of some of the newest research into natural therapies and assistance for vitiligo The skin's white spots in different bodily parts are diagnostic of the skin condition vitiligo. Melanocytes, which are the cells that cause it, die. These are the cells that make the pigments that give your skin its color. We analyze research to determine whether supplements, diet, or herbs can help.

Ginkgo Biloba

Botanical name

Ginkgo biloba L.

Kingdom

Plantae

Division

Pinophyta

Phylum

Ginkgophyta

Class

Ginkgoopsida

Family

Ginkgoaceae

Genus

Ginkgo

Geographical distribution

Tree found in other regions. With a history spanning over 5000 years, herbal medicines hold great promise as a source of novel therapeutic agents. One of the medicinal plants that is frequently used to cure a variety of illnesses and ailments is ginkgo biloba. Ginkgo biloba has been recognized for over 2,000 years as a beneficial plant for humans. The English term "maidenhair tree" comes from the likeness of the veins and leaf form of maidenhair fern.One common natural herbal remedy for vitiligo is ginkgo biloba, or just ginkgo. Ginkgo has potent antioxidant properties and supports healthy immune system activity, two vital health benefits in the management of vitiligo. However, if you have a bleeding disease or are about to have surgery, you should not take ginkgo.[19]

***Figure 8*:** *Ginkgo biloba*

Black Pepper

Synonyms

Kalimirch (Hindi), Golmarich (Bangali), Milagu- Milagu

Biological source

It is made up of dried, unripe Pipper nigrum Linn fruits.

Family

Piperaceae

Geographical source

Native to India, black piper is extensively grown in Kerala, Karnataka, Maharashtra, and Assam. You may find this plant all the way from North Kanaka to Kanyakumari. In addition, Malaysia, Indonesia, Brazil, Sri Lanka, South America, and the West Indies cultivate it.

Chemical Constituents

Piperidine group of alkaloids: Piperine, Piperidine, Chavicine,

1-2.5% volatile oil: Phellandrene, Caryophyllene, Piperonal, Camphene, Pinene,

Argenine Ascorbic acid, Carotene, Thiamine and riboflavin.

When it comes to the treatment of White Patches, pepper is important. There are medications made from black pepper that have been successfully used to increase pigmentation. The substance that gives pepper its spicy flavor, "piperine," is responsible for the pigment-stimulating properties of pepper. According to a research by Kings College in London, piperine generated visually superior effects by encouraging a more uniform coloring in the skin as opposed to traditional therapies that resulted in spotty and patch re-pigmentation. The British Journal of Dermatology also published the findings, which was extremely well-received.[20]

Figure 9*: *Black Pepper

Cucumis Melo

Kingdom

Plantae

Family

Cucurbitaceae

Genus

Cucumis

Species

C. melo

Biological Name

Cucumis melo

Synonym

Cucumis

The melon is a trailing annual plant. Warm, temperate or subtropical conditions are ideal for its growth. Melons are sensitive to downy mildew and anthracnose, but they grow best in Warm, nutrient-rich, well-fertilized soil with good drainage. Crop rotation using crops other than cucurbits lowers the risk of disease by avoiding crops like melons that are susceptible to diseases related to them. Some genotypes have developed resistance to powdery mildew as a result of cross-pollinating.[21] Early research has been done to see whether a topical preparation containing catalase and superoxide dismutase (SOD) from Cucumis melo is effective in treating vitiligo. In every trial, the skin lesions were prepared with gel and then exposed to either artificial UVB or natural UV light. Despite the drug's demonstrated safety, the incidence of repigmentation did not

differ from that of patients receiving phototherapy alone [22]. The application of an alternative phenylalanine, acetyl cysteine, and Cucumis melo extract in a topical formulation is more intriguing and encouraging.[23]

Figure 10*: *Cucumis Melo

Visnaga Daucoides

Kingdom

Plantae

Family

Apiaceae

Genus

Visnaga

Species

V. daucoides

Binomial Name

Visnaga daucoides Gaertn

Synonym

Ammi dilatatum St.-Lag., Ammi visnaga (L.) Lam., Apium visnaga (L.)" [24]

Description

Growing erect from a taproot, this annual plant can reach a maximum height of around 31 inches (80 cm). The leaves are usually oval to triangular in shape and reach up to 20 cm (7.9 in) in length, though they can sometimes be divided have many little segments that are lance-shaped to linear [24]. Similar to more species of Apiaceae, A complex umbel of white flowers makes up the inflorescence. The crushed oval body of the fruit is less than 3mm in length. Visnaga daucoides is still commonly used to refer to Ammi visnaga because some scholars believe it to be a synonym for that species.[25]

Khellin

A furanochromone found in nature, khellin is produced from the plant 'Amni visnaga'. Since ancient Egypt, the Asthma, kidney disease, and other ailments have all been treated using this plant as a natural treatment, and other conditions. Due to the negative effects of khellin, such as allergic reactions and liver dysfunction, Analogs that are safer and more efficient of khellin have been created and used in medicine in recent decades to treat vitiligo [26]. When combined with UVA phototherapy, these analogues have shown promising results. Khellin stimulates melanocyte proliferation and melanogenesis, but its precise mode of action is unknown. Both topically and systemically (oral dosing) are possible ways to provide khellin. KUVA treatment is the term used to describe the combination of oral Khellin with UVA.The course of treatment involves giving the

patient oral khellin gelatin capsules and then subjecting them to UVA radiation for around 2.5 hr. Repetition of the therapy session occurs two or three times per week. The treatment is safe and has results similar to those of PUVA therapy. Khellin, like topical PUVA, can be applied topically and utilized with UVA radiation (topical KUVA therapy) or natural UVR (sol-KUVA therapy). This does not negate the need to assess the risk of carcinogenesis [27]. Recent studies have successfully used topical khellin 4% in combination with monochromatic excimer light at 308 nm [28]. The clinical results' repigmentation rate and safe profile suggest that this combination may be useful in the treatment of vitiligo.

Figure 11*: *Visnaga Daucoides

Picrorhiza Kurroa

Among the primary non-timber forest products that bring in money in the Himalayan region of Nepal is Picrorhiza kurroa. Among the first medicinal plants from the Karnali region to be traded is this one. This perennial herb, also called kutki or कुटकी in Nepali, is used instead of Indian gentian (Gentiana kurroo).[29]

Kingdom

Plantae

Family

Plantaginaceae

Genus

Picrorhiza

Species

P. kurroa

Binomial name

Picrorhiza kurroa Royle ex Benth

Description

Leaves

often withered, 3–5 cm long, and almost totally at the base.The coarsely serrated leaves slenderize into a wing-bearing stalk.

Rhizomes

plant has woody, 15–25 cm long rhizomes.

Flowers

tiny, purplish blue or pale, borne in cylindric spikes on nearly leafless, upright stalks. 8 mm flowers with five lobes extending to the center and much longer stamens.

Fruits

length 1.3 cm.

Chemistry

Kutkin, a bitter glycoside containing Picroside I and Kutakoside, two C-9 iridoid glycosides, is part of the chemical composition of Picrorhiza kurroa.[30]

Attempts were made by Ayurvedic medicine to treat vitiligo by using herbal remedies like Picrorhiza kurroa.A recent study looked into the possibility of using Picrorhiza Kuroda in conjunction with phototherapy to cure vitiligo. For three months, the medication was taken orally twice a day. Repigmentation has been observed to respond better when the two procedures are combined. Anarchic is another Ayurvedic herbal medicine that has been utilized to cure vitiligo. Concentrated topical medicinal formulations made from Anacardiaceae plants. The medication appears to have photosensitizing properties. Regretfully, additional information and study are required.[31]

***Figure 12*:** *Picrorhiza Kurroa*

Polypodium Leucotomos

Kingdom

Plantae

Division

Polypodiophyta

Class

Polypodiopsida

Family

Polypodiaceae

Genus

Phlebodium

Species

P. aureum

Binomial Name

Phlebodium aureum (L.) J.Sm.

Synonym

Polypodium aureum L.”

Description

With a spreading rhizome that is 8 to 15 mm in diameter (perhaps 30 mm) and heavily coated in the species' name-giving golden-brown scales, it is a rhizomatous fern. The enormous, pinnatifid (deeply lobed) fronds have an undulate edge and range ranging in hue from vivid green to glaucous green. The pinna midrib is flanked by several spherical sori, and the tiny spores are distributed by

the wind [32]. In regions with continuous rainfall, the fronds are evergreen; in regions with a distinct dry season, they are semi-evergreen or short deciduous. Skin cancer, vitiligo, psoriasis, polymorphous light eruption, atopic dermatitis, postinflammatory hyperpigmentation, and photoaging are examples of dermatological diseases have all been researched in relation to oral ingestion of Polypodium leucotomos extract.Tropical fern Polypodium leucotomos, commonly called "Calaguala," belongs to the 'Polypodiaceae family'. Extracts from it are utilized to treat a number of skin disorders, such as atopic dermatitis and psoriasis,because of its well-known antioxidant and photoprotective qualities.Polypodium leucotomos has been used as an adjuvant therapy for phototherapy-treated vitiligo patients in the past several years. An intriguing study highlights how oral.[33]

Figure 13*: *Polypodium Leucotomos

Green Tea

Unlike black and oolong teas, green tea is made from Camellia sinensis leaves and buds that have not undergone the same oxidation and withering process. Green tea initially gained popularity in China and has subsequently spread to other East Asian countries adopted its manufacturing and production practices. There are various varieties of green tea, it varies greatly dependent on variety of "C. sinensis" used, conditions for growth, producing procedures, horticultural methods, and time of harvest.Since ancient times, green tea leaves have been utilized medicinally[34].

These compounds are known as green tea polyphenols. According Recent studies have shown that green tea polyphenols may help treat vitiligo by preventing the melanocyte unit's oxidative stress.

Figure 14*: *Green Tea

Figure 15*: *Green Tea

Turmeric (Curcuma longa)

Mechanism of Action

Curcumin, the active compound, has anti-inflammatory and antioxidant properties. Improves insulin sensitivity and modulates insulin secretion.

Use

For mild to moderate vitiligo lesions, turmeric cream can be used as an adjuvant therapy or alternative treatment.[35]

Figure 16*: *Turmeric

Ashwagandha (Withania somnifera)

Mechanism of Action

Adaptogenic properties help manage stress, a contributor to diabetes. Improves insulin sensitivity and glucose metabolism.

Exhibits antioxidant effects, protecting pancreaticc cells.

Use

Skin diseases like Vitiligo can also be cured with Ashwagandha.

The disease vitiligo results in patches of skin that are darker than the rest of the skin. When the pigment-producing cells either die or cease to function, it happens. Ashwagandha is diminish the state to a great extent when consumed regularly.

Figure 17*: *Ashwagandha

Neem (Azadirachtaindica)

Mechanism of Action

Contains compounds like nimbin and nimbidin with anti-hyperglycemic effects. Improves insulin sensitivity and reduces glucose absorption in the intestines.

Exhibits anti-inflammatory and antioxidant properties.

Use

Neem oil or neem leaf paste can be applied to the afflicted regions to calm the skin and treat vitiligo.

Figure 18*: *Neem

Aloe Vera (Aloe barbadensis miller)

Mechanism of Action

Polysaccharides in aloe vera may have anti-hyperglycemic effects. Improves insulin sensitivity and lowers blood sugar levels. Exhibits antioxidant properties, protecting against diabetes-related complications.

Use

In people with vitiligo, aloe vera gel may be a safe and efficient substitute for phototherapy in minimizing adverse effects.[36]

Figure 19*: *Aloe Vera

CONCLUSION

Vitiligo is a complicated autoimmune disease situation when the pigmentation of the skin is lost, which can significantly affect 'patients quality of life'. Despite significant advancements in comprehending its genetic, immunological, environmental triggers,the exact pathogenesis of 'vitiligo' remains incompletely understood. Recent therapeutic approaches, including targeted immunotherapies and novel repigmentation strategies, have shown promise in managing symptoms and improving outcomes for patients. However, there remains a critical need for further research to optimize these treatments and develop personalized therapeutic strategies. Additionally, increased focus on patient education and support is essential for improving the psychosocial well-being of those affected by vitiligo. Continued interdisciplinary efforts will be key to advancing the understanding and management of this challenging condition.

REFERENCE

1. A. Kumar., S. Sharma., B. Kumar., Vitiligo: A review of Literature, Journal of Dermatological Surgeon, 2017:21(1):1-9.
2. Singh R.K., Lee S.M., Kumari N., Kumar S., Chaudhary R., Vitiligo A Review of Treatment Options and Future Research Directions, Journal of Clinical Aesthetic Dermatology,2017:10(10):14-24.
3. Alikhan A., Felsten L., Daly M., Petronic V. Rosiac., Vitiligo A Comprehensive Overview Part:I, Introduction, Epidemiology, Quality of Life, Diagnosis, Differential Diagnosis, Associations, Histopathology, Etiology, Journal of American Academy of Dermatology, 2011:65(3): 473–491.
4. Hachiya A., Kobayashi A., Yoshida Y., Kitahara T., Takema Y., Imokawa G., Biphasic Expression of two Paracrinemelano Geniccytokines Stemcell Factor and Endothelin1, Inultravioletb Inducedhuman Melanogenesis, Journal of Pathology, 2011:165(6):2099–2109.
5. Frisoli M.L., Harris J.E.,Vitiligo: Mechanistic in Sights Lead to Novel Treatments ,Journal of Allergy Clinical Immunology,2017:140(3):654–662.
6. Sun Q., Rabbani P.,Takeo M., Lee H., Lim C.H., Review on Regulation During Wound Healing, Journal of Investigating Dermatology,2018:138(7):1591–1600.
7. Jane S.B., Neil S. Prose., Vitiligo in Children, A Review of Classification, Hypotheses of Pathogenesis and Treatment Anais Brasdermatology, Journal of Dermatological Surgeon,2005:80(6):633-47.
8. Saraceno R., Nisticò S.P., Capriotti E., Khellin in the Treatment of Vitiligo, A Journal of Controlled Study of Dermatology, 2001:22(4):391–404.
9. Rajpal S., Clinical Profile and Management Pattern of Vitiligo, Journal of Clinical and Diagnostic Research, 2008:(2):1065-1068.
10. Taieb A., Picardo M., Vitiligo European Task Force Members, the Definition and Assessment of Vitiligo, A Journal of European Dermatology,2007:20(1):27–35.
11. Gawkrodger D.J., Ormerod A.D., Shaw L., Mauri Sole I., Whitton M.E., Watts M.J., Guidelines for the Management of Vitiligo, Journal of Dermatology,2008:159(5):1051–1076.
12. Vitiligo, Types, Symptoms, Causes.Https://My.Clevelandclinic.Org/Health/Diseases/12419-Vitiligo (accessed24.09.24).

13. Felsten L.M., Alikhan A., Petronic Rosic V., Vitiligo: A Comprehensive Review Part I, Pathogenesis, Diagnosis, and Clinical Presentation, Journal of American Academy of Dermatology,2011:65(3):473-491.
14. Khurana A., Detailed Review on Tacrolimus in Vitiligo, International Journal of Dermatology, 2009:48(1):86-90.
15. Passeron T., Ortonne J.P., Vitiligo: Review of the literature, Journal of Clinical Aesthetic Dermatology,2010:3(10):14-17.
16. Slominski A.T., Zmijewski M.A., Plonka P.M., Szaflarski J.P., Paus R., Review of Management of Vitiligo, British Journal of Dermatology, 2018:159(1):1992–2007.
17. Skobowiat C., Slominski A.T., A Review of UVB in Treatment of Vitiligo, Journal of Investigation Dermatology ,2015:135(1):1638–1648.
18. Do J.E., Shin J.Y., Kim D.Y., Hann S.K., Oh S.H., The Effect of 308nm Excimer Laser on Segmental Vitiligo a Retrospective Study of 80 Patients with Segmental Vitiligo, Journal of Photodermatology and Photoimmunology, 2011:27(17):147–151.
19. Lopes C., Trevisani V.F., Melnik T., Efficacy and Safety Of 308 nm Monochromatic Excimer Lamp Versus Other Phototherapy Devices for Vitiligo, A Systematic Review with Meta Analysis, Journal of Clinical Dermatology, 2016:27(17):23–32.
20. Szczurko O., Boon H., A Systematic Review of Natural Health Product Induced Adverse Reactions in Patients with Vitiligo, Journal of Medical Surgeon, 2008:12(4):169-176.
21. Lin Z., Hoult J.R., Bennett D.C., Review on Stimulation of Mouse Melanocyte Proliferation by Piper Nigrum Fruit Extract and its Main Alkaloid, Piperine Planta, Journal of Clinical Dermatology,1999:65(7):600-603.
22. Hamzavi I., Jain H., McLean D., Shapiro J., Zeng H., Parametric Modeling of Narrowband UV Phototherapy for Vitiligo using Novel Quantitative Tool, Journal of Archives Dermatology, 2011:147(6):646-651.
23. Naini F.F., Shooshtari A.V., Ebrahimi B., The Effect of Pseudocatalase Superoxide Dismutase in the Treatment of Vitiligo, A Pilot Study, Journal of Research Pharmacy Practice,2012:1(2):77–80.
24. Yuksel E.P., Aydin F., Senturk N., Comparison of the Efficacy of Narrow Band Ultraviolet B Plus Topical Catalase Superoxide Dismutase Treatment in Vitiligo Patients, Europian Journal of Dermatology,2009:19(4):34–42.
25. Thomsen N., Wulf H.C., Treatment with Topical Khellin in Combination with Ultraviolet and Solar Simulated Radiation is Carcinogenic to Lightly Pigmented Hairless Mice, Journal of Photodermatology and Photoimmunology ,1996:11(6):24–28.
26. Dogra S., Kumar B., Epidemiology of Vitiligo A Study from North India, Journal of Dermatology,2003:30(10):729-735.
27. Morliere P., Hönigsmann H., Averbeck D., Phototherapeutic Photobiological and Photosensitizing Properties of Khellin, Journal of Investigation of Dermatology,1988:90(5):20–47.
28. Ortel B., Tanew A., Hönigsmann H., Treatment of Vitiligo with Khellin and Ultraviolet a Journal of American Academy of Dermatology,1988:18(1):693–701.
29. Nestor M., Bucay V., Callender V., Review on Polypodium Leucotomos as an Adjunct Treatment of Pigmentary Disorders, Journal of Clinical Aesthetic Dermatology,2014:7(3):7–13.
30. Njoo M.D., Westerhof W., Bos J.D., Bossuyt P.M., Review on the Development of Guidelines for the Treatment of Vitiligo, Journal of Clinical Dermatology, 1999;135(12):1514-1521.

31. Ezzedine K., Sheth V., Rodrigues M., Eleftheriadou V., Harris J.E., A Review of the Evidence of Vitiligo is not Caused by a Single Genetic Defect, Journal of Experimental Dermatology, 2015:24(5):322-329.
32. Edlich R.F., Winters K.L., Lim H.W., Review of Photoprotection by Sunscreens with Topical Antioxidants and Systemic Antioxidants to Reduce Sun Exposure, Journal of Dermatology,2004:14(18):317–340.
33. Parsad D., Pandhi R., Dogra S., Kumar B., Review on Clinical Study of Repigmentation Patterns with Melagenina Plus Ultraviolet Therapy in Vitiligo, Journal of Dermatological Surgeon 2004:30(5):731-736.
34. Khadatkar S. N., Preparations and Evaluation of Microcapsules of Capsaic, International Journal of Chemical Sciences,2007:5(5): 2333-2341.
35. Yogesh B. Raut, Sanjay K. Bais, Nikita Landage, Review Role of Ayurveda in Diabetes, International Journal of Pharmacy and Herbal Technology,2024:2(1):791-810.
36. Yogesh B. Raut, Sanjay K. Bais, Sahara Chavan, Review Moisturizing Activity of Herbal Cold Cream for Skin Dryness, International Journal of Pharmacy and Herbal Technology ,2024:2(1):407-417.