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Effectiveness of Root of *Glycyrrhizaglabra*on Vitiligo

[1]P.M Herath, [2]P.Vijitha, [3]R.Piratheepkumar
[1, 2, 3]Unit of Siddha Medicine, Trincomalee Campus
Corresponding Author:[1]P.M Herath

Abstract: Vitiligo is a disease which can be occurred at any age characterized by hypo-pigmented patches in some areas of the body. Within the patch sensation is normal and no inflammatory signs. Problem with the melanin production of the affected areas and the reason for affecting only certain areas still not explained. This disease has poor medical compliance and the influence of the normal life of the affected patients is harsh.
This survey was done based on Siddha quotation, mentioned in the Siddha text book MateriaMedica written by Murugesamuthaliyar. This is a Single Blind Case Control Observational Comparative Clinical Trial to determine the effectiveness of an external administration of ointment which was prepared by root powder of Glycyrrhizaglabra. Patients were collected from Outdoor patient division (OPD), General hospital Trincomalee under supervision of Dermatologist, General Hospital, Trincomalee. Same patient was selected as test and control, in different lesions. Fifteen patients were selected for this survey. Medicine was advised to apply on lesion which was selected as test, in twice daily. Observation was done once in three weeks for three months of duration.
According to results, p-value could be calculated as 0.019 for effectiveness in skin pigmentation. 0.05< p-value gives significant results. Effectiveness on affected area size difference p-value is 0.053. In the case of control group according to the above both clinical features, showed significant p-value. But according to the score it's able to understand the reason for gaining above value not because of the effectiveness of anything; it is due to aggravation of the lesion. But in test group there is no evidence of skin depigmentation.
Therefore improvement was observed in skin re-pigmentation and also depigmentation was controlled by root powder ointment of Glycyrrhizaglabra within three months of duration. Alteration of dosage form, increase number of patients and increase the time duration will help to accelerate the recovery.

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I. INTRODUCTION

This is a Single Blind Case Control Observational Comparative Clinical Trial to determine the effectiveness of an external administration of ointment which was prepared by root powder of *Glycyrrhizaglabra*.

A relatively high prevalence of Vitiligo was found in Africa area and in female patients. The prevalence has maintained at a low level in recent years. It showed an inverse trend with age increment in population- or community-based studies and hospital-based studies.The prevalence of Vitiligo varies in different geographic regions and different sample size, and the data have limitations and localizations. Besides, the disorder afflicts various ethnic populations with varying prevalence estimates ranging from 0.1% to 2.0% based on the general populations in previous studies. Although Vitiligo occurs worldwide, it is known that the reported prevalence of Vitiligo is various. Prevalence distributions might differ in areas. In the included population- or community-based studies, the lowest prevalence was in Asia and Atlantic, the second-highest in Africa and in Europe, and the highest in Oceania. But only one study was included, the result of Oceania was not definite. In hospital-based studies, prevalence was the lowest in America and the highest in Africa(Oiso, 2016).

II. LITERATURE REVIEW

Researches on Vitiligo result in more options of Vitiligo treatment. If someone would like to give traditional therapy can try, there is PUVA system and steroid creams. People who want to try new technologies on treating Vitiligo a narrow-band UVB is available. Other than that, Pseudocatalase cream, skin grafting and pigment transplantation, excimer lasers, topical psoralens, and immune modulators are great choices(Amanda, 1990).
Treatment may help make the skin look more even. The choice of treatment depends on,

- The number of white patches
- How widespread the patches are
- The treatment the person prefers to use.

Some treatments are not right for everyone. Many treatments can have unwanted side effects. Treatments can take a long time, and sometimes they don't work.Current treatment options for Vitiligo include medical, surgical, and other treatments. Most treatments are aimed at restoring color to the white patches of skin(Faston, et al., 2011).

The disease pathway of the skin pigmentary disorder Vitiligo involves hereditary factors, disease onset after overproduction of reactive oxygen species, and disease expansion through an adaptive, antigen-specific immune response to melanocytes. The current study was performed to obtain further knowledge of the disease process through patient questionnaires. Fifteen questions describing the condition of Vitiligo were posted on the National Vitiligo Foundation and Vitiligo Support International Web sites and distributed by participating dermatologists to patients visiting their clinics. A total of 400 responses to the survey were collected and subjected to statistical analysis. The data support an overall increase in affected skin averaging 1% per year, with 50% of patients displaying a Koebner phenomenon, where new skin lesions appear at sites of trauma. Approximately 25% more women than men develop the disease. Patients recognize the importance of hereditary factors and the involvement of stress in precipitating the disease, yet only few note the contribution of an autoimmune response. Patients with relatives affected by vitiligo demonstrated an earlier age of onset. Autoimmune diseases found to be at least 25-fold more prevalent among respondents include Addison's disease, sarcoidosis, diabetes, and alopecia areata. Among a third of patients currently undergoing treatment, half note satisfactory efficacy, in particular for depigmentation treatment or topical immune modulation(Cedercreutz, et al., 2010)

Vitiligo usually occurs after birth and the average age of onset is around 20 years. Vitiligo commonly affects the face and extremities and is often immediately visible to others hence evokes high levels distress associated with appearance concern. Both sexes are affected equally, although women are more likely to seek treatment. Disease progression is unpredictable and response to treatment is highly variable.(Chandler, et al., 2014).

The psychosocial impact of vitiligo is comparable to that of other common skin diseases such as psoriasis and eczema. Within the clinical guidelines, the main impact of Vitiligo is the psychological effect of the disease. For example, a review by Ongenae, indicated that high levels of emotional responses were reported, such as increased self-consciousness, lower self-esteem, higher levels of perceived stigma and disability, anger, poorer Quality Of Life (QOL) overall and negative impact on sexual relationships. Within a UK survey the majority of patients reported that Vitiligo moderately or severely affected their QOL(Chandler, et al., 2014)

Patients often report feeling distressed and embarrassed about their appearance, which can lead to low self-esteem, fear of rejection and social withdrawal. The key factors in this process are how people living with vitiligo interpret it, how they interpret themselves and how they interpret and respond to the experience of being in a social situation. In particular, patients have difficulties with social anxiety and high level of appearance related concern. These difficulties can cause a person with Vitiligo to experience a range of negative emotions and demonstrate certain behaviors and thoughts that can perpetuate psychological distress(Chandler, et al., 2014)

A study by Schmid-Ott et al. indicated that patients with Vitiligo used avoidant coping styles compared to controls. Some strategies appear to be more psychologically helpful than others, as avoidance and concealment can exacerbate distress. Concealment through the use of cosmetic creams or selective choice of clothing may enable people to engage in activities that they may have avoided. However these strategies have short-term positive consequences and the underlying issues remain. The psychosocial consequences are often more significant for females, with detrimental effects particularly on sexual relationships and perceived suitability for marriage. Characteristics commonly associated with a lower QOL in patients with Vitiligo include darker skin color (Fitzpatrick skin type IV-VI), greater skin involvement, more visible lesions, longer disease duration and previous failed treatments(Chandler, et al., 2014).

Some studies have suggested that the impact of Vitiligo on psychosocial well-being is greater in early childhood during the formative years; others argue that early age of onset is a protective factor as it allows for the development of coping mechanisms at a time when physical appearance is less of a concern. A study conducted in India showed that patients with vitiligo had a range of concerns including how the disease would progress and its implications on social participation, employment and marriage opportunities. There were several misconceptions about the cause of vitiligo however most patients did not think the disease was contagious or related to leprosy. Misconceptions and negative attitudes around Vitiligo can cause increased emotional distress and heightened feelings of rejection and isolation for those affected(Chandler, et al., 2014).

According to Siddha medicine, *Wenkuttam* is a disease characterized by localized loss of pigmentation, diminish skin colour and later converts white and prominent formation of white patches. It is classified as *Vatha, Pitha, Kapha, MehaWenkuttam*(Visuvanatham, 1984).

This condition can be compared with Vitiligo in allopathic medicine.

According to allopathic medicine Vitiligo is an autoimmune disease which characterized by hypopigmentation frequently in hands, wrist, knee and neck. Melanocytes are the target of cell mediated autoimmune attack but why only focal areas are affected remains unexplained(Davidson, 2010).

Siddha and Ayurveda systems it is categorized under *kustha/ kutta* disease. The most common causative factor is inappropriate food combinations which is the result of our fast-paced lifestyle. It also called as *shwedhakuttam*.This disease causes swelling in particular area instead of whiting. Hairs of the affected area also become whitish or fallen. According to Siddha, vitiligo is caused by the aggravation of pitta*dosha*. Pitta is anSiddha humor which symbolizes heat or fire, and is manifest in the skin. Aggravated pitta leads to accumulation of *ama* (toxins) in deep layers of the skin, leading to the condition of vitiligo.Pitta are of five types; one of them is ranjakapitta which gives coloration to skin. In the case of vitiligo, *RanjakaPitham* is in an imbalanced state, and therefore, the skin starts losing its color and white patches appear. Along with *pithadosha*, deeper body tissues like *charamdhatu* (nutrient plasma), *cenner*(blood), *oon* (muscles), *kozuppu* (lymph) are also involved in the disease. Treatment consists of pacifying imbalanced body energies, cleansing the blood and administrating herbs that restore the skin's natural color. Poor digestion is the root cause of this disease, as it causes the build-up of toxins in the tissues. An essential part of treatment, therefore, is restoring digestion. The patient is advised on the correct diet and lifestyle adjustments to prevent recurrence of the disorder(Kannasami, 1956).

III. OBJECTIVE

General Objective

To identify the effectiveness of the root powder of *G.glabra* on Vitiligo.

Specific Objectives

To evaluate the psychological impacts in Vitiligo.

IV. MATERIALS AND METHODS

1.1. Preparation of medicine

The plant *G.glabra*was selected from the quotation of general character of *G.glabra*which is mentioned in the text book of *Kunapadam* (Part I) *Porutpanpunool*writtenby K.S.MurugesaMuthaliyar.Root of *G.glabra*wascollected from different areas within the Trincomalee district. It was subjected to purified, dried and made in to fine powder.Root of *G.glabra*was authenticated by section of *Kunapaadam* division of Unit of Siddha Medicine, TrincomaleeCampus.Plant material was purified by removing sand, mud and washed with running water, and then dried under shade. After that it was ground and obtained aspowder.Dosage was selected based on the amount which needs to cover the lesion area completely.Medicine was prepared asanointment (25%). Subject was requested to apply on cleaned and chosen patch twice daily. Ointment was prepared by triturating 750g of emulsifying ointment with 25g of *G.glabra*root powder.

1.2. Study design

This is a Single Blind Case Control Observational Comparative Clinical Trial.

1.3. Methodology

The study was conducted at General hospital for 03 months from June to September 2017. Fifteen patients were selected randomly, based on the inclusion and exclusion criteria in OPD, GeneralhospitalTrincomalee,and the consent for study was taken in written from every patients.

The single blind parallel efficacies of selected drugs were administrated for Ninety days with five intervention treatment aims.

Assessment of the disease was done through the history taking, general examination and systemic examination. The research drug preparation was advised to apply externally twice a day for 03 months' time. The clinical evaluation of the patient was performed once in a three weeks.

First day demarcation was marked by using copying patches of both control and test group on an oil paper. After three weeks, the demarcation was taken again as same method and observed the difference of pigmentation with previous sketch. Each patient was subjected to consider one lesion as test and another lesion as control. Same person was tested for test and control in separate lesions.Evaluation of skin pigmentation was done according to the criteria,

1.4. Clinical evaluation

Evaluation visits were made at baseline and3rd, 6th, 9th, 12th, 15th, 18thof weeks. Effect of treatment was evaluated on the basis of changes in skin pigmentation and affected area size difference, were considered the clinic parameters and recorded at every visit.

1.4.1. Assessment method

Vitiligo European Task Force (VETF)was used for asses the progress of lesion.

1.4.2. Calculation of Vitiligo affected area

Patients were selected as the Vitiligo affected area is **<30%.** Affected area percentage was taken by according to below formula,

$$\text{Affected area} = \frac{\text{Surface area of the lesions}}{\text{Body surface area}} \times 100$$

1.4.3. Calculation of effective

The clinical efficacy of the drug was analyzed statistically on all the symptoms n assessment criteria. Initially, the variation and significance of effect seen within the 15 patients were calculated by paired *t test*. The difference of individual score SD was calculated with Standard Error in Mean (SEM). These data are shown as Mean ± SEM. Then, to more specifically quantify the percentage of improvement in each patient, this was also calculated using the formula (AT – BT) × 100/BT based on affected area size difference.

On the basis of grading pattern as well as percentage of improvement affected area size reduction, patient was classified under the below criteria

V. Results And Comments

1.5. Age and sex of the patients

Among the 15 patients' 40% were males and 60% were females. The highest number, 20% patients were between the ages of 20-30 and 51-60 years; of them 20% were females while 13.33% were males.

Table : Age and Sex distribution of the patients inVitiligo

Age	Sex				Total	
	Male		Female			
	No.	%	No.	%	No.	%
20 – 30	2	13.33	3	20	5	33.33
31 – 40	1	6.66	1	6.66	2	13.33
41 – 50	1	6.66	2	13.33	3	20
51 – 60	2	13.33	3	20	5	33.33
Total	6	40	9	60	15	100

1.6. Onset age of the patients

The highest percentage of onset age group was noted at the age group of 10-20 years as 33.33%. 20% were observed in the age group of 31-40 and 41-50 years.

Table : Relationship between the age of onset of the disease in patients and number

Age(years)	No.	%
10 – 20	5	33.33
21 – 30	4	26.66
31 – 40	3	20
41 – 50	3	20
51 – 60	-	-
Total	15	100

1.7. Suicidal attempt of patient

53.33% of both sex patients were noticed under the stage of wanted to suicide because of this disease in which half of them are female (50%), while 33.33% were tried to suicide in which 80% were male. Only 13.33% were never thought to commit suicide because of this disease.

Table : Relationship between the suicidalattempts of the patients and number

Suicidal attempt	Sex				Total	
	Male		Female			
	No.	%	No.	%	No.	%
Tried to suicide	1	6.66	4	26.66	5	33.33
Wanted but not tried	4	26.66	4	26.66	8	53.33
Never thought	1	6.66	1	6.66	2	13.33
Total	6	40	9	60	15	100

1.8. Skin pigmentation variant in each visit of test group

66.66% of patients were noted that without any changes in pigmentation in test group, while 26.66% were noted in control group. Complete pigmentation was noted in 13.33% of patients in test group while 0% was noted in control. Like, incomplete pigmentation was noted 20% in test and 0% in control. All the above data were derived after the 5th visit. Incomplete depigmentation was observed only in control group that was 73.33%

1.8.1. Skin pigmentation variant in test group in each visit

Table : Correlation of skin pigmentation with visits in Test group

Skin pigmentation	Number of Visits – Test									
	1st		2nd		3rd		4th		5th	
	No	%	No	%	No	%	No	%	No	%
Normal pigmentation	15	100	13	86.66	11	73.33	11	73.33	10	66.66
Incomplete pigmentation	0	0	2	13.33	4	26.66	3	20	3	20
Complete pigmentation	0	0	0	0	0	0	1	6.66	2	13.33
Incomplete de-pigmentation	0	0	0	0	0	0	0	0	0	0
Complete de-pigmentation	0	0	0	0	0	0	0	0	0	0

1.8.2. Skin pigmentation variant in each visit of Control

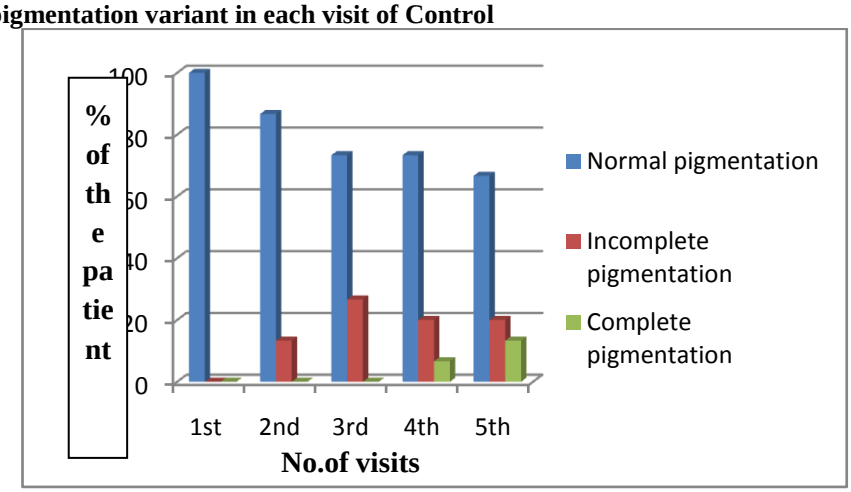


Figure 1: Relationship between the pigmentation changes and number of visits in test group

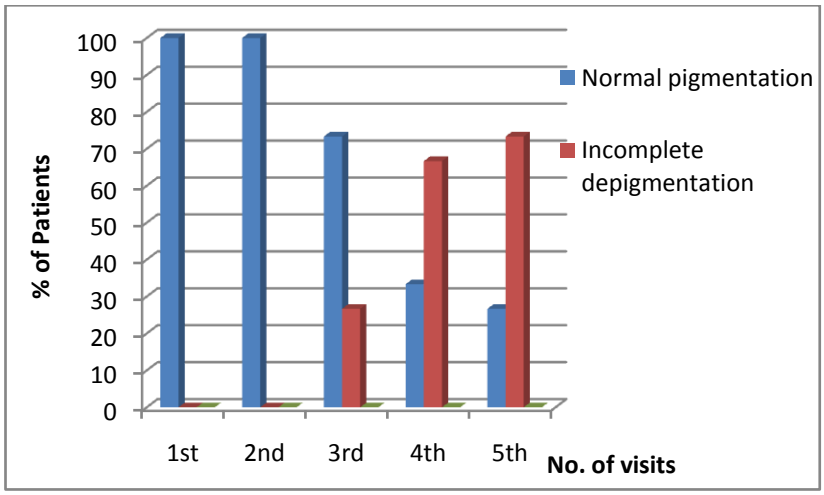


Figure 2: Relationship between the pigmentation changes and number of visits in Control group

1.8.3. Evaluation of effectiveness of the test drug comparing with control

1.8.3.1. Effect on test group

The Mean value of skin pigmentation on the 1st visit and 2nd visit were 0 and 0.13 respectively and Mean values for 3rdand 4thvisits were0.27 and last visit was 0.33. Test group p-value was calculated as 0.019 in final visit

Skin pigmentation	Before treatment	After treatment				
		1st visit	2nd visit	3rd visit	4th visit	5th Visit
Mean	0	0	0.13	0.27	0.27	0.33
Mean reduction	-	-	0.133	0.267	0.267	0.333
Standard deviation	0	0	0.352	0.458	0.458	0.488
Standard Error Mean	0	0	0.091	0.118	0.118	0.126
Df	-	-	14	14	14	14
Paired "t"	-	-	1.468	2.256	2.256	2.646
P	-	-	0.164	0.041	0.041	0.019

1.8.3.2. Effect on control

The Mean value of skin pigmentation on the 1st visit and 2nd visit were 0. Mean values for 3rd and 4th visits were -0.27 and -0.33. Last visit was -0.73.Control group p-value was 0.00

Skin pigmentation	Before treatment	After treatment				
		1st visit	2nd visit	3rd visit	4th visit	5th Visit
Mean	0	0	0	-0.27	-0.33	-0.73
Mean reduction	-	-	-	-0.267	-0.333	-0.733
Standard deviation	0	0	0	0.458	0.488	0.458
Standard Error Mean	0	0	0	0.118	0.126	0.118
Df	-	-	-	14	14	14
Paired "t"	-	-	-	-2.256	-2.646	-6.205
P	-	-	-	0.041	0.019	0.000

The p-value of test group in final visit was 0.019. If the p-value is less than 0.05, the results will be significant. Therefore the test group results showed significant. But, in-case of control, the p-value showed as 0.00 that did not mean the efficacy of drug in Vitiligo is greater than the test group, where it was reflected only the development of depigmentation.

1.9. Effectiveness of affected area size difference in test group

	Before treatment	After treatment				
		1st visit	2nd visit	3rd visit	4th visit	5th Visit
Mean	0	0	.0153	0.0827	.0927	0.1273
Mean reduction	-	-	0.01533	0.0826	.09267	0.12733
Standard deviation	-	-	.4051	0.17019	.18480	0.23313
Standard Error Mean	-	-	.01046	.04394	.04377	0.06019
Df	-	-	14	14	14	14
Paired "t"	-	-	1.466	1.881	1.942	2.115
P	-	-	0.165	0.081	0.073	0.053

1.10. Effectiveness of affected area size difference in control

Skin pigmentation	Before treatment	After treatment				
		1st visit	2nd visit	3rd visit	4th visit	5th Visit
Mean	0	0	0	-.0827	-.0753	-.2820
Mean reduction	-	-	-	-.08267	-.07533	-.28200
Standard deviation	0	0	0	.17019	.12955	.24484
Standard Error Mean	0	0	0	.04394	.03345	.06322
Df	-	-	-	14	14	14
Paired "t"	-	-	-	-1.881	-2.252	-4.461
P	-	-	-	.081	.041	.001

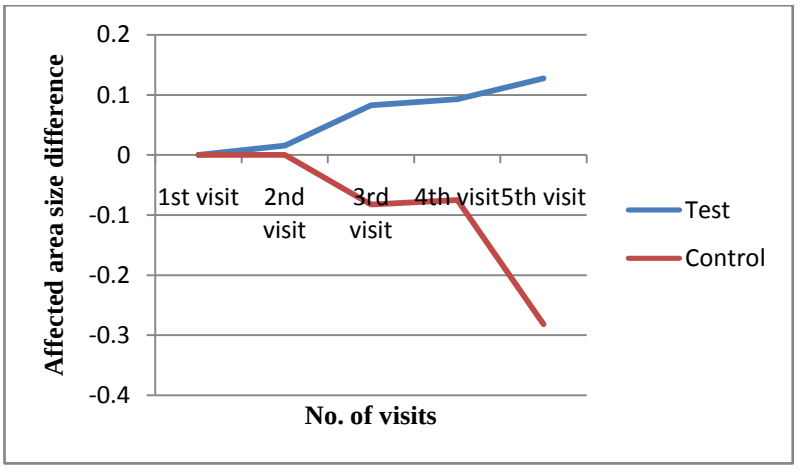
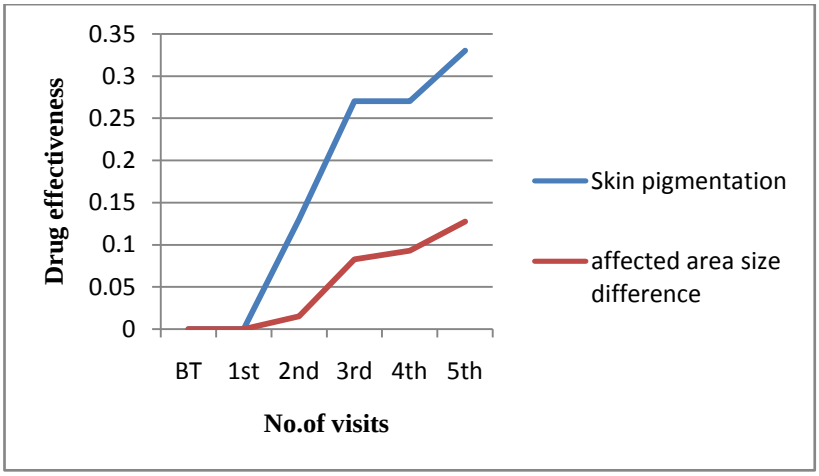


Figure 3: Relations between affected area size differences with visits

5.7. Evaluation of drug effectiveness

	BT		Visits											
			1st		2nd		3rd		4th		5th		Total	
	M	ED	M	ED	M	ED	M	ED	M	ED	M	ED	M	ED
SP	0	*	0	*	0.13	*	0.27	*	0.27	*	0.33	*	0.2	*
AS	41.58	0	0	0	0.0153	0.036	0.0827	0.19	0.0927	0.22	0.1273	0.3	0.0636	0.15

- SP = Skin pigmentation
- AS = Affected area size difference
- M = Mean
- ED = Effectiveness of the drug (%)
- * Impossible to get drug effectiveness based on Skin pigmentation (SP), because initial value of the lesion before treatment was taken as 0.



5.7.1. Drug effectiveness based on affected area size difference

$$Drug\ effectiveness = \frac{\text{Total mean difference in before and after treatment}}{\text{Total mean before treatment of the patch}} \times 100$$

$$Drug\ effectiveness = \frac{0.0636}{41.58} \times 100$$

= 0.15%

Note-In control group no patient noted with positive size difference. Negative result was obtained due to de-pigmentation.

5.7.2. Drug effectiveness based on skin pigmentation

$$Drug\ effectiveness = \frac{No.of\ pigmentation\ improved\ patients}{Total\ patients} \times 100$$

$$Drug\ effectiveness = \frac{5}{15} \times 100$$

$$Drug\ effectiveness = 33.33\%$$

Note- In control group no patient noted with skin re-pigmentation

VI. Discussion

Vitiligo is an acquired idiopathic de-pigmentory condition and is characterized by completely de-pigmented patches of varying sizes and shapes with normal sensation.

Women are more likely to seek treatment. Disease progression is unpredictable and response to treatment is highly variable(Chandler, et al., 2014).

According to table 5.1 highest percentage as (60%) has been noted as females among the 15 patients. Males were 40%, that indicates among Vitiigo population mostly females are intended to seek treatments for the disease condition.

The highest numbers of affected age groups were 20 – 30; those were 33.33%.Vitiligo usually occurs after birth and the average age of onset is around 20 years(Chandler, et al., 2014). According the present study the Vitiligo disease onset age among the 15 patients was higher in the age group of 10 – 20 years. There were no patients noted in the age group of 51 – 60 in the case of onset of disease age.

Vitiligo itself its impact goes beyond skin. Because it can be detrimental to patient's physical and mental health knownas associated with certain psychological conditions. It is important to recognize and deal with psychological components of this disease to improve their quality of life and to obtain a better treatment response(Hamzavi, 2015). Vitiligo treatments include rather than medication and surgical treatment, counseling and support(Faston, et al., 2011).In this study showed, 33.33% of patients were attempted to suicide because of these disease and 53.33% patients were thought as wanted to suicide but not attempted. Those who are in the thought of suicidal attempt have a risk of getting suicide in future due to depressive psychological disorder resulted due to Vitiligo. So Vitiligo rises up most serious social consequence involving not only physical health but also someone's mental health and with the ability of ending of life. Not only medical or surgical therapies, counseling and supportwillbe most grateful for Vitiligo patients for better recovery.

According to the MuruhasamMuthaliyar,*G. glabra*could be used for management of Vitiligo. *G. glabra* is a medicinal plant which uses for many diseases. The effective ingredient in G.glabra is mainly glycyrrhizin, which has antiviral, anti-inflammatory and antioxidant properties. So it uses for many skin problems(Lamont jones, 2017). It was proved by this scientific study. In this study, skin pigmentation enhancement wasobserved in the test drug; 26.66% of normal pigmentation (stable lesion) was observed in control group in the 5th visit, while 66.66% was observed in test group. This was reflected, that test drug was improved the pigmentation in the affected area of the skin. Meantime, incomplete depigmentation was observed about 73.33% in control group. There was 0% observed in incomplete depigmentation in the test group. In test, normal pigmentation (stable patch) is improving in to incomplete or complete pigmentation and there is no depigmentation has been taken place. In control the above incidence is happening in opposite way, means in control group normal pigmentation (stable patch) is gradually undergone for depigmentation which test group is not undergone.

The p-value of the pigmentation variation of the test group in final visit was 0.019. Meantime the every visit pigmentation variant p – value were also decreased towards 0.019. It showed thatpigmentationwasgradually improved in the test group. If the p-value is less than 0.05, the results will be significant. Therefore the test group results showed significant. But, in-case of control, the p-value showed as 0.00 that did not mean the efficacy of drug in Vitiligo is greater than the test group, where it was reflected only the development of depigmentation.

The mean values of affected area size difference are gradually increasing. It reflects enhancement of pigmentation along with affected area size is getting reduced.Affected area size difference in to opposite side is indicated by (-) numerical values. It reflects test group is improving pigmentation and reducing lesion area while control group aggravation of lesion area can be observed.

The lesion size difference was observed in insignificantly in test group in 5^{th} visit (p-value 0.053), while size different was significantly observed in control group (p-value 0.001). This happened, because in the test group the size of the patches were not increased. Size was stable in test group. But in control group, the size of the patches was increased.

According to Siddha medicine *suwai*(taste)of root of G.glabra is sweet, *veeryam*(potency) is cold and *vipakam*(output) is sweet (Murugesamuthaliyar, 2013). Vitiligo is a skin disease and mainly affected dosha *is Pitham.* According to the organoleptic characters, *Pitham*pacifying nature can be observed, because its suwai and *vipakam* is sweet, when consider five element composition of sweet;*Pitham*pacifying quality can be verified.

The effectiveness of the drug in each visit. Based on skin pigmentation effectiveness can be presented as from total patients how many patients was undergoing for pigmentation. It is 33.33%. Based on affected area size difference, drug effectiveness can be taken as how much improved in pigmentation comparing with before treatment mean value of lesions; it is 0.15%. According to the category has mentioned in 4.9.2.1, mild to moderate action of drug on skin pigmentation could be seen in the test drug.

Overall drug effectiveness of the drugindicatedthat the drug was good on the management of Vitiligo during three months of duration.

*G. glabra*mainly uses for respiratory problems with the action of expectorant and antitussive action. The high content of sugar gives soothing to the mucus membrane and emollient to the skin. Medical treatments for Vitiligo includes external steroidal therapy, internal steroidal therapy, a treatment that uses medicine plus ultraviolet (UV) light (PUVA)(Faston, et al., 2011). *G. glabra* has corticosteroidalactivity(Senevirathna, 2013). It was proved this study.

Vitiligo is an acquired disorder of pigmentation, caused by decreased production of melanin as a result of dysfunction of melanocytes. Antioxidants are compounds that help to inhibit many oxidation reactions caused by free radicals such as singlet oxygen, superoxide, peroxyl radicals, hydroxyl radicals there by preventing or delaying the damage to the cells and tissues. Plant derived natural products such as flavonoidsterpenoids and steroids have diverse pharmacological properties including antioxidant activity(Jayarama, et al., 2014).

Vitiigo is a disease with hypo-pigmented patches with normal sensation which cause is commonly unknown. Within the skin among pigmented areas existence of the hypo pigmented areas is still not explained(Davidson, 2010).

However Vitiligo is a chronic disease condition and it has poor medical compliance. Vitiligo affects to the patient as it considers as a stigma in society. According to the literature as well as this study the psychological influence, that patient has to face, may end with end of the life.

So, social impact of this disease should not be ignored.

VII. Conclusion

Effectiveness based on skin pigmentation is 33.33%. It reflects mild to moderate action of drug. Effectiveness based on affected area size difference is 0.15%. Therefore overall drug effectiveness is good. Root powder of G. glabra in preparation of 25% ointment, shows effectiveness on Vitiligo.

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