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Management of pityriasis versicolor through a Sri Lankan indigenous herbal formula

RRPS Nilmini[1], KGC Dissanayake[2]
[1] Department of Dravyaguna Vignana, Gampaha Wickramarachchi Ayurveda Institute, University of Kelaniya, Sri Lanka
[2] Department of Cikitsa, Gampaha Wickramarachchi Ayurveda Institute, University of Kelaniya, Sri Lanka

Abstract
Pityriasis versicolor is a non-contagious fungal infested dermatological condition with well demarcated circinate or confluent macules over trunk, neck, and arms where the density of sebaceous glands is high. The study focused on management of the pityriasis through a Sri Lankan indigenous topical herbal application which has not been scientifically studied. Randomly selected 30 cases with pityriasis versicolor were comparatively studied applying testing drug and *nimbadi lepa* in two separate groups in equal amounts for a period of one month under recommended control conditions. Size, colour, clinical form, itching of the lesion were graded before and after the treatment. The efficacy of the testing drug was found with significant reduction in size, itching, color and clinical form of lesions after the treatment. The testing herbal formula has elaborated a significant effect in the management of pityriasis versicolor with herbal ingredients having antifungal effect against *Malassazia* species.

Keywords: Pityriasis versicolor, macules, herbal formula, *Nimbadi lepa*

1. Introduction
Pityriasis versicolor is considered as non-contagious topical infestation caused by proliferation of lipophilic yeast in the stratum corneum [1]. Common Malassezia species such as Malassezia globosa with Malassezia sympodialis and Malassezia furfur are responsible for Pityriasis versicolor [2]. Malassezia, as a part of normal skin flora, are not pathogenic unless they assume a mycelia form [3]. Well demarcated round or oval macules over the trunk, neck, and upper arms have appeared in pityriasis condition. The colour of the pigmented area is getting varied with the density of overlying sebaceous glands; hyper-pigmented patches could be available in highly dense areas, as well hypo-pigmented patches are available in lighter skin types. Therefore, the colour of the pityriasis infested area is getting varied according to the complexion [4]. Severity of the infestation and the variation of colour over the infested locations are triggered by factors like, humidity and high temperature, hyperhidrosis, familial susceptibility and immunosuppression [5]. The diagnosis of pityriasis versicolor is confirmed by microscopic evaluation through scraping the affected skin over the borders of lesions, or obtaining samples through the transparent tape method. Similarly, Wood's light examination method is widely used in the diagnostic procedures considering the lesions appeared in yellow or gold [6].
The current study has focused to evaluate the clinical effect and efficacy of topically applied antifungal herbal formula in the management of pityriasis versicolor [7]. The testing formula has been extracted from Rajaushadhanidhiya, an ancient indigenous medical classic in Sri Lanka.

2. Materials and Methods
2.1. Preparation of the testing drug
94 g from each of fresh leaves of *Ipomoea obscura,* rhizome of *Curcuma longa,* leaves of *Cassia fistula,* fruits of *Phyllanthus emblica* were collected, cleaned and ground into fine paste form collectively. The grounded product was found as 375g.
1.5 liters of fresh juice were squeezed from each of the aforementioned ingredients and collectively obtained 6 liters. The mixture of squeezed juices was mixed with 1.5 liters of sesame oil (Oil squeezed from dried seeds of *Sesamum indicum* Linn.). The oil and juice mixture was boiled and evaporated till reaching 1.5 liters of volume while continuous stirring. Meanwhile the grounded paste was mixed along with the boiling mixture and stirring was continued. Referring to the *Thaila Paribhasha* mentioned in Sharangadhara Samhita, a great ancient classic of Ayurveda medicine; the medicated oil was prepared [8, 9] and filtered. 1.5 kg of beeswax was melted and mixed with the filtered oil mixture and stirred continuously to mix well. The mixture was kept in the room temperature and the obtained final product was allowed to be solidified into the anointment texture.

2.2. Clinical study
Thirty pre-diagnosed patients with pityriasis versicolor were selected from Outpatients Department of Gampaha Wickramarachchi Ayurveda Teaching Hospital referring to the simple random sampling method. Detailed disease history of selected individuals were obtained separately after obtaining the informed written consent from each of patients to attend the study.
In the selection process, patients diagnosed with Pityriasis versicolor in age between 16 to 60 years old were randomly selected irrespective of gender, religion, habitat etc. Individuals beyond the mentioned age range, pregnant and lactating cases, pre diagnosed cases with morbid psychopathologies, or any other physical diseases condition were excluded from the study.
The selected patients were divided randomly into two groups in similar portions. The testing group (A) was treated using the prepared herbal formula and the study group (B) was treated with Nimbadi lepa. Both the groups were instructed with a recommended manual of regimens and

instructed to continue the topical application over the cleaned affected areas for one month without any of other treatments for Pityriasis versicolor. (Dose-120mg, Time-morning and evening).
In the dermatological examination, size, color, clinical form, itching of the areas with lesions were graded using a five-point scale at before and after the treatment through a pre-formatted questionnaire and dermatological assessments were done using photographs of the lesions. The follow up period was considered as three months. The obtained findings were analyzed using Statistical Package for the Social Sciences (SPSS) and Microsoft Excel.

3. Results

3.1. Demographic profile

3.1.1. Incidence of gender

Amongst 30 cases having pityriasis versicolor, 70% of male cases and 30% of female cases were reported. The obtained findings inferred that males are much more vulnerable to infest pityriasis versicolor.

3.1.2. Age wise distribution

Table 1: Age wise distribution

Age	Percentage
16-26yr	16.67%
27-36yr	60%
37-46yr	46.67%
47-56yr	46.67%
57-66yr	13.33%

The age wise distribution among 30 cases of pityriasis versicolor reveals that the maximum number of patients between the age group 27-36 years, 60%. This is followed by the next higher incidence, 46.67% patients in the both age group 37-46years and 47-56years.

3.1.3. Incidence of occupation

Table 2: incidence of occupation

Occupation	Percentage
Studying	16.67%
House wife	13.33%
Service	53.33%
Business	16.67%

The findings revealed that the maximum number of cases (53.33%) belong to physically and mentally hard services.

3.1.4. Incidence of chronicity

Table 3: incidence of chronicity

Chronicity	Percentage
<1yr	30%
1-5yr	46.67%
6-10yr	16.67%
>10yr	6.67%

Maximum number of cases were suffering from the pityriasis for 1-5 years of duration.

3.2. Clinical profile

3.2.1. Effect on the size of lesion

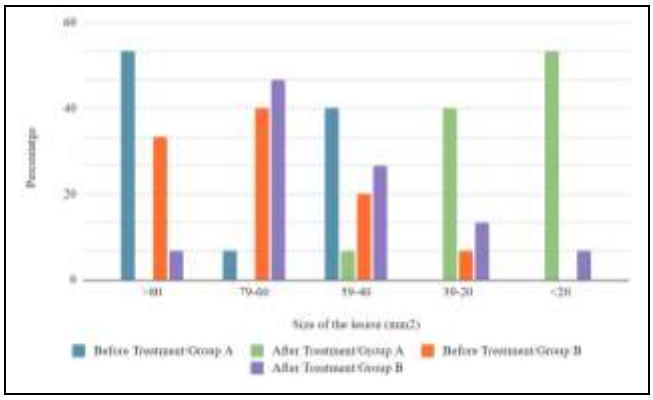

Fig 1: Reduction of the size of lesions

These results proved that the herbal formula cream has worked well on reducing the size of affected areas of pityriasis versicolor than Nimbadi Lepa.

3.2.2. Changing of the color over the lesion

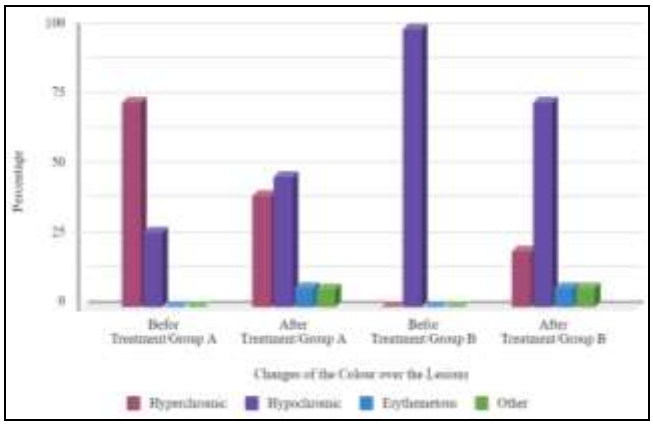

Fig 2: Changing color of affected area of pityriasis versicolor

These obtained results elaborated that the testing drug effectively reduced the colour variations over the lesion compared to the Nimbadi Lepa.

3.2.3. Changes in clinical form of the lesion

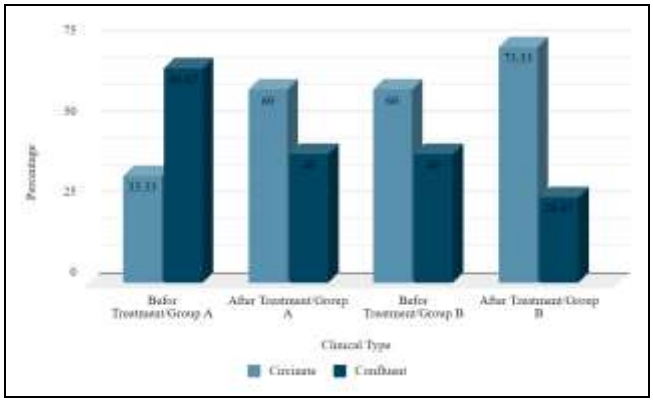

Fig 3: Changings in the clinical form of the lesion

3.2.4 Reducing the itching of lesion

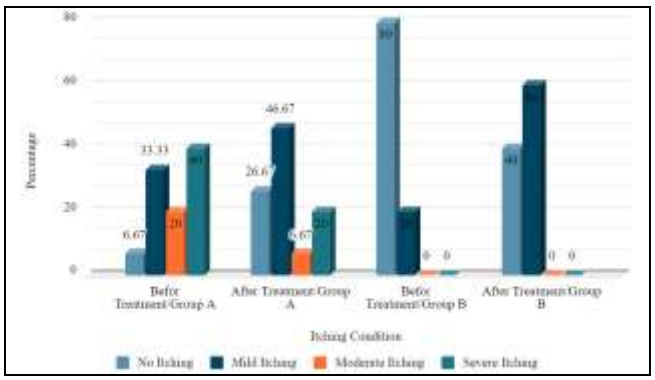

Fig 4: Effect on itching condition over the lesion

3.3 Statistical analysis of the clinical profile

Table 5: Variation of the clinical profile of both groups after four weeks - p value of paired sample of T-test

Criteria of the clinical profile	p value
Size of the lesion -Test group	0.000
Size of the lesion -Control group	0.012
Colour of the lesion -Test group	0.000
Colour of the lesion - Control group	0.082
Clinical form of the lesion -Test group	0.040
Clinical form of the lesion - Control group	0.164
Itching over the lesion -Test group	0.000
Itching over the lesion - Control group	0.000

Both the testing drug and the Nimbadi lepa have elaborated significant ($p<0.05$) effects on reduction of the size (surface area) of the lesion, and itching over the lesion. The testing drug has depicted significant effects on reduction of the colour over the lesion and changing of the clinical form of the lesion. Though, the nimbadi lepa has not elaborated a significant effect on changing of the clinical form and the reduction of the colour over the lesion.

4. Discussion

Fungi in *Malassezia* genus are responsible for pityriasis versicolor. The current study has focused on studying the effect and efficacy of selected Sri Lankan indigenous topical herbal medical preparation in the management of pityriasis versicolor. The study reveals that the incidence of occurrence of pityriasis versicolor was much more common among males compared to females. Referring to the previous clinical studies on pityriasis versicolor, Archana *et al*, gosh *et al*, Rao *et al*. and Krishnan *et al*. also found males are much vulnerable in pityriasis versicolor condition [11, 14] due to the engagement in high amount of outdoor activities which results in sweating and remaining of sweats over the skin leading to *Malassezia* infestations [15]. Similarly, the current study has proven the explanation given by above mentioned authors as compliant.

Referring to the changes of colour over the lesion, the testing drug was musch effective in reduction of hyperchromic condition over the lesion and the group B with Nimbadi lepa has elaborated that the Nimbadi lepa effects in hypochromic changes. Considering the highest incidence in colour of the lesion, the current study depicted that most of pityriasis versicolor cases were having hypochromic lesions. Similarly, Archana *et al*, gosh *et al*, Rao *et al*, and Krishnan *et al*. had mentioned that the pityriasis versicolor cases were predominant with hypochromic lesions [12, 14]. The explanation given by Aljabre *et al*. highlighted that there was no correlation between occurrence of pityriasis versicolor with type of skin, complexion, gender, anatomical location of the lesion and age variation of the infested cases [16].

The occurrence of the pityriasis versicolor condition was much common among adult age groups likely 27-36 years old, 37 -46 years old and 47-56 years old respectively. Similarly, Rao *et al*, Krishnan *et al*, Dutta *et al*, Archana *et al*, and Tarazoori *et al*. had reported that the occurrence of pityriasis versicolor was much common among adult age groups [11, 14]. Furthermore, el-Hefnawi *et al*. highlighted that the pityriasis versicolor was highly prevalent during the third and fourth decades of life [17, 19]. Akapata *et al*. explained this incident as a result of increment of sebum secretion during the aforementioned period [20]. The current study elaborated that the most common incidence of occurrence of pityriasis versicolor has been reported in people who are engaged in the service sector likewise both the physical and mental predominant occupations. Thus, reveals excessive sweating and sebum production leads to remain sebum and sweat over the skin that facilitates fungi colonies to develop. Some of the previously conducted studies revealed that the most common sites of infestations were chest, trunk, back, neck, arm and axilla due to the highest distribution of sebaceous glands over there [11, 13, 17, 18].

The testing drug consisted of leaves of *Ipomoea obscura*, rhizome of *Curcuma longa*, leaves of *Cassia fistula* and fruits of *Phyllanthus emblica*. As well, Nimbadi lepa, the drug used in Group B consisted of the leaves of *Azadirachta indica*. Considering the antifungal effect of these herbal ingredients, *Ipomoea* species, *Curcuma* species, *Cassia fistula*, *Azadirachta indica* and *Phyllanthus emblica* were found having antimicrobial effect on *Malassezia* fungi [21, 30]. Therefore, both the groups were found with significant reduction of surface area of the lesions and itching over the lesions due to the inflammation caused by infestation of *Malassezia* fungi. Similarly, the clinical form of the pityriasis versicolor condition changed after the treatment in both the groups. The findings revealed that after the period of two weeks of treatments, the amount of circinate lesions were increased meanwhile the confluent lesions were decreased. Hence, the study inferred that antifungal effects of both the herbal preparations effectively contribute in the management of pityriasis versicolor condition. Though, the group A had a significant improvement in changing the clinical form from confluent to circinate type lesions. In the group A, after the treatment the color of the lesion significantly changed into hypochromic. Though, in group B the colour change was not significant and the incidence of hypochromic lesions were comparatively reduced.

5. Conclusion

The current study objectified to study the effect and efficacy of Sri Lanakan indigenous topical herbal preparation in the management of pityriasis versicolor condition compared with Nimbadi lepa. The randomized clinical study elaborated that the indigenous topical herbal formula was highly significant in the management of pityriasis versicolor condition, due to the antifungal effectivity of consisted herbal ingredients against *Malassezia* species. The comparative study revealed that the indigenous topical herbal preparation was more effective than Nimbadi lepa in

the management of pityriasis versicolor condition.

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