DEMODEX FOLLICULORUM DENSITY IN SEBORRHEIC DERMATITIS PATIENTS

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Seborrheic dermatitis is a common, chronic relapsing papulo squamous disorder. Many etiological factors have been implicated and among them, *Demodex folliculorum* may play as one of the aetiological factors in seborrheic dermatitis. Seborrheic dermatitis is found in regions of the body with high concentrations of sebaceous glands and hair follicles which are also preferred by *Demodex folliculorum.* To detect the number of *Demodex folliculorum* parasites in seborrheic dermatitis patients and compare the density of *Demodex folliculorum* between a group of seborrheic dermatitis patients and a group of age-group and sex- matched healthy control subjects. A cross sectional comparative study was carried out during one-year period with a study population of 45 seborrheic dermatitis patients and 45 healthy control group. Demodex mites were detected by Standardized Skin Surface Biopsy. The samples were examined under light microscope. In this study, (55.6%) of seborrheic dermatitis cases and (24.4%) of control cases were Demodex positive (P value was 0.003). Demodex density ≥5 were encountered in severe SD (100.0%) and moderate cases (33.3%) but no mild cases had Demodex density of ≥5. It was concluded that the number of demodex mites are higher in seborrheic dermatitis patients than in control group. Among the seborrheic dermatitis patients, the severe type of patients had more Demodex density than mild and moderate type.
Keywords: *Demodex folliculorum*, SDASI score, seborrheic dermatitis, standardized skin surface biopsy

INTRODUCTION

"Seborrheic dermatitis (SD) is a chronic dermatitis which is difficult to define exactly, but it has a distinctive morphology and a distinctive distribution in areas with a rich supply of sebaceous glands, namely the scalp, face and upper trunk. In some cases, the flexures are also involved".[1] The prevalence rate of seborrheic dermatitis is 3%–5% of young adults, and 1%–5% of the general population.[2]

Seborrheic dermatitis is a common skin problem in adolescent and middle aged people. Although SD is not a life threatening disease, it causes social deprivation and finally it may lead to the development of depression.[3]

According to the statistical data at the Department of Dermatology, Yangon General Hospital, total patients of seborrheic dermatitis was about 2-3 % each year. Despite high frequency of SD in human population, the exact etiology is poorly understood. However, many studies proposed that Malassezia furfur is a major causative factor, the exact mechanism still unclear.

Seborrheic dermatitis lesions occur in area of high sebaceous glands and *Demodex folliculorum* (DF) mites are residing in pilosebaceous unit. It is interesting that whether there is any causal association between SD and *Demodex folliculorum*.

"*D. folliculorum* may play a direct or indirect role in the aetiology of seborrheic dermatitis. One case-control study in Turkey, *Demodex folliculorum* was detected in 19 (50%) of the 38 seborrheic dermatitis patients but only 5 (13.1%) of the control".[4] The density of Demodex on healthy skin is normally <5 mites/cm^2.[5]

Dermatosis with higher demodex density was treated with an acaricidal treatment. As a result, the normalization of demodex density was seen. So, it may be involved as a part of the pathogenesis of seborrheic dermatitis.[6]

METHODOLOGY

This study group composed of 90 people, in which 45 seborrheic dermatitis patients and 45 age-group and sex matched control.

Standardized skin surface biopsy (SSSB)

First, the skin and the glass slide were cleaned with alcohol before performing. Then a drop of cyanoacrylate adhesive was placed on a microscope slide. A standard surface area of 1cm^2 was drawn on the slide with red water proof pen. The area of 1cm^2 was also divided

into four equal squares to make the further counting of parasites easier. The adhesive bearing surface of the side was applied to the skin, and it was removed gently after it has been allowed to stick about 90 seconds. After removal from the skin, the sample was clarified with 2-3 drops of oil, and then covered with a cover slip. The samples were examined under light microscope with standard magnification (×10, ×40). Each specimen was examined and mite number was counted twice within 2 hours to avoid error in mite counting. Only mites clearly identified on the basis of their anatomical characteristics were counted.

Report

Mites count - $< 5/cm^2$ = Normal

Mites count - $\geq 5/cm^2$ = Infestation

The severity assessment of seborrheic dermatitis by SDASI scoring system[7]

In SDASI scoring system, scalp, face and chest were examined separately. In each of the three areas, skin lesion was graded based on three criteria: erythema, papule, and scale. Severity was rated for each index on a 0-3 scale (0=absent, 1=mild, 2=moderate, 3=severe). In each of these areas, the fraction of total surface area affected was graded on a 1-5 scale.

Surface involved (per body region)	Value given
<10%	1
11-30%	2
31-50%	3
51-70%	4
>70%	5

The SDASI score was calculated by multiplying the sum of the individual severity scores for each region by the area of involvement score for that respective region. Seborrheic dermatitis patients were divided into three groups i.e. mild, moderate, severe according SDASI score. (Mild = 0-7.9, Moderate = 8-15.9, Severe = >16)

RESULTS

According to severity score, severe SD was 37.8%, moderate and mild SD were 26.7 % and 35.6 respectively. Acording to the figure below, (55.6%) of SD cases had Demodex while (24.4%) of control had Demodex.

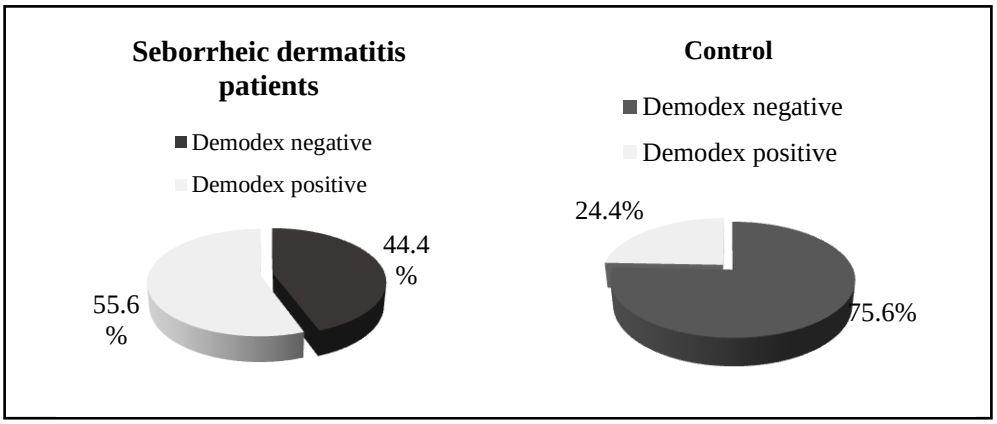

Figure 1. Demodex positivity between SD patients and control.

In comparing the Demodex density among Demodex positive patients and control, (76%) of seborrheic dermatitis patients had Demodex density ≥5 whereas only (27.3%) of control had Demodex density ≥5. Therefore, seborrheic dermatitis is significantly associated with high Demodex density (P value =0.01).

Table1.Distribution by correlation between Demodex density & severity of SD patients among the Demodex positive patient

Disease severity	Demodex density		P value (Fisher's exact test)
	≥5	<5	
Moderate	3 (33.3%)	6 (66.7%)	<0.001
Severe	16 (100%)	0 (0%)	

DISCUSSION

"Seborrhoeic dermatitis is a common, relapsing dermatitis that is characterized by erythematous patches with superficial scaling. It affects areas with a high density of sebaceous glands".[8]

Nowadays seborrheic dermatitis patients are increasing among those with various skin disorders. Although it is not life threatening condition, it belongs to the dermatological disorders, most have negative influence on patient's day to day social life.

Although many dermatologists agree with higher Demodex mites in seborrheic dermatitis, exact mechanism are still investigating. Regarding this study, SD patients had the chance of being Demodex positive two times higher than control. According to density, demodex density ≥ 5 group contained moderate cases (33.3%) and severe cases (100%). Demodex mites (Figure 2) are also often found more commonly in areas of skin with more sebum and it has been found that seborrhoea is a precipitating factor for seborrheic dermatitis. Moreover, these mites can obstruct the sebaceous canals and follicles so that it can facilitate the disease formation process. Finally, some studies show improvements in skin conditions with mite killing drugs. All of this suggests that Demodex mites can play a role in seborrheic dermatitis.[5]

In this study, it is found that statistically significant association of Demodex density and severity of SD patients. For this reason, further studies should be done for the role of *Demodex folliculorum* in detail pathogenesis of seborrheic dermatitis. Although this study may be a preliminary study on association of seborrheic dermatitis with *Demodex folliculorum* infestation, it is hoped that this study will provide some useful information for the management.

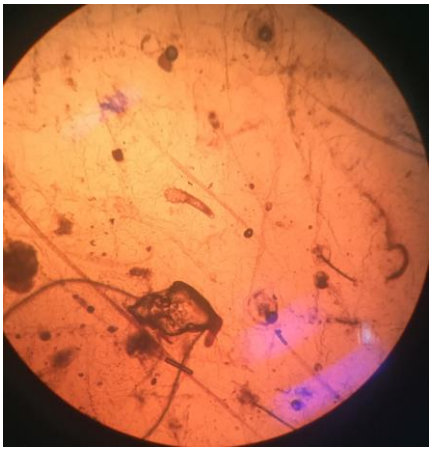

Figure 2. *Demodex folliculorum*

CONCLUSION

Demodex density varies with the severity of seborrheic dermatitis significantly. As higher Demodex density is found to be associated with severe type of seborrheic dermatitis than mild and moderate type. It was a further option for next research on the effects of eradication of Demodex infestation in severe type of seborrheic dermatitis and treatment response with larger study population.

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