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A Study of Clinical, Dermoscopic and Histopathological Correlation of Clinically Suspected Ashy Dermatosis: A Cross-Sectional Study at A Tertiary Care Centre

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ABSTRACT
To study the correlation of clinical, histopathological and dermoscopic features of clinically suspected AD patients. A total of 50 clinically suspected AD patients were recruited in this study. A detailed history, cutaneous examination and dermoscopic patterns were documented. A punch biopsy was taken from the site where dermoscopy was performed, stained with Hematoxylin and Eosin (H and E) and examined under light microscope. Out of 50 patients, 41 were females and 9 were males with male to female ratio being 1:4.5. The age ranged between 20-52 years with mean age of 40.54 years. Majority of the lesions were ill-defined, diffuse, brownish macules most commonly involving upper limbs. On dermoscopy, majority revealed brown dots and brown globules separated by white septae in a random distribution with brown background, irregular linear vessels and focal fine scaling. Histopathology revealed basal cell vacuolar degeneration, dermal lymphocytic infiltration and pigmentary incontinence. The association of dermoscopic and histopathological features in clinically suspected AD patients was 100% and was statistically significant ($p<0.001$). The sensitivity and specificity of dermoscopy against histopathology was 100%.

INTRODUCTION

Ashy dermatosis (AD) also known as Erythema dyschromicum perstans (EDP) is an acquired pigmentary disorder of unknown etiology[1] mainly characterised by brownish to bluish grey pigmentation of trunk, limbs and face[2]. It was first reported by Ramirez of El Salvador in 1957 under the term "los cenicientos" (the ashy ones)[3]. Because of its occurrence over the exposed body areas[2], it has caused a lot of cosmetic concern and emotional disturbances. It has to be differentiated from other acquired pigmentary disorders like lichen planus pigmentosus, post inflammatory hyperpigmentation, macular amyloidosis etc.

Histopathology reveals vacuolar degeneration of basal cells, pigment incontinence, dermal lymphohistiocytic infiltrate and presence of melanophages[4]. Dermoscopy is a newer diagnostic modality in pigmentary disorders. The various pigment patterns can help us in easily diagnosing and differentiating it from other conditions. Very few studies are available in the literature and as we are well versed with the clinical findings of AD, we are attempting to reduce the need of histopathological examination which is an invasive procedure by exploring newer modalities which are less time consuming and patient friendly.

MATERIALS AND METHODS

A descriptive cross-sectional study was performed with 50 patients in Out Patient Department (OPD) of Dermatology Venereology and Leprosy, Hassan Institute of Medical Sciences, Hassan during the period April 2022 to June 2022. Those patients with clinically diagnosed ashy dermatosis of age more than 18 years and those who gave consent and were willing to participate in the study were included. Patients who have been previously treated, pregnant and lactating women, patients who were on medications causing lichenoid drug eruption, patients with history suggesting pigmented contact dermatitis or usage of any abrasive material, patients with systemic disorders and those with past history of keloid tendency were excluded from the study. Institutional ethics committee clearance was obtained prior to the start of the study.

An informed written consent was taken from the patients after explaining the procedure in their own understandable language. A detailed history of the patient including name, age, sex, occupation, presenting complaints, age of onset, site, duration, family history was recorded. A thorough clinical examination of the patients was done and findings were recorded. Clinical photographs were taken after taking consent.

Then the lesions were examined with the use of a hand-held, polarized and nonpolarized 3Gen-Dermlite DL4 dermoscope and the pattern of lesions were documented. A punch biopsy was taken from the site where dermoscopy was performed. Under aseptic conditions, the site was anaesthetized using lignocaine 2% injection (after test dose). Biopsy was performed using a disposable 5 mm skin biopsy punch and the wound was closed. Then specimen was sent in 10% formalin for histopathological examination where the slides were stained using Hematoxylin and Eosin (H and E) and examined under light microscope. The histopathological images were captured. Statistical analysis was done by Statistical Package for Social Sciences (SPSS) version 20 and Microsoft Excel 2007 using descriptive and inferential statistics.

RESULTS

There were about 50 patients with clinically suspected ashy dermatosis. Majority of patients (54%) were in the age group of 41-50 years. The mean age of patients was 40.54 years. Females (82%) outnumbered males (18%) with male to female ratio being 1:4.5. Majority of patients were housewives (52%). History of itching was present in 13 (26%) patients. Only 8 patients (16%) gave positive family history. Majority of patients (64%) had a Fitzpatrick's skin type IV followed by skin types III (32%).

The most common morphology of lesions was brown macules (72%) with diffuse pattern of pigmentation (66%) and with ill-defined borders (88%) in our study (Fig. 1 and 2). The most common site of involvement were upper limbs (70%) with bilateral distribution (74%). On histopathological examination, we found mild hyperkeratosis (12%), focal parakeratosis (22%), basal cell vacuolar degeneration (86%), epidermal atrophy (14%), lymphocytic infiltration in upper dermis and perivascular region (92%) and pigmentary incontinence (94%) (Fig. 3 and 4).

On dermoscopy, brown dots and brown globules separated by white septae (86%) were present in random distribution (68%), patchy clustered distribution (10%) and widespread distribution (8%). The most common colour of the background was brown (62%) followed by skin colour (16%) and pinkish brown (8%). The most common pattern of vessels was irregular linear (20%) followed by dotted (8%) and coiled (4%). Other features were focal fine scaling (18%) and some non-specific changes (Fig. 5-7).

In our study, clinical findings suggestive of AD were present in all patients (100%). But positive histopathological and dermoscopic findings were present in 86% of patients. The association of dermoscopic and histopathological features in clinically suspected AD patients was 100% and was statistically significant ($p<0.001$). The sensitivity and specificity of dermoscopy against histopathology in our study was 100%.

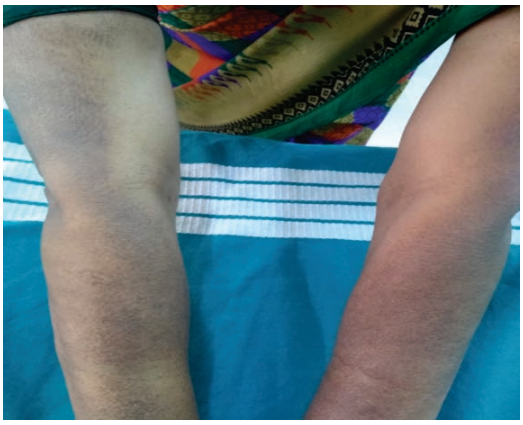

Fig. 1: Ill-defined, diffuse, brown macules over bilateral upper limbs

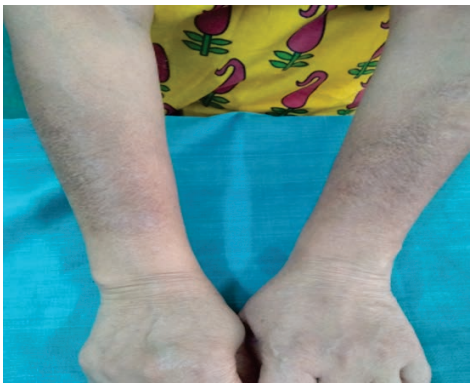

Fig. 2: Ill-defined, diffuse, brown macules over bilateral upper limbs

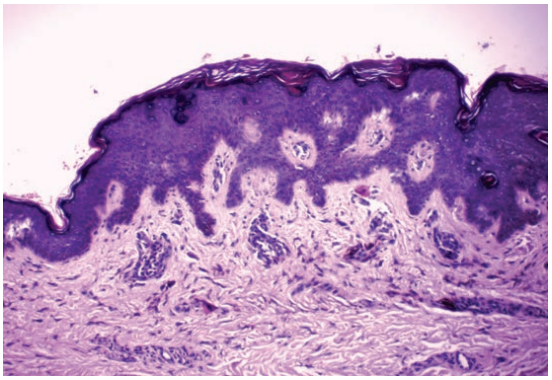

Fig. 3: lymphocytic infiltration and pigmentary incontinence in the dermis (H and E stain, 10X)

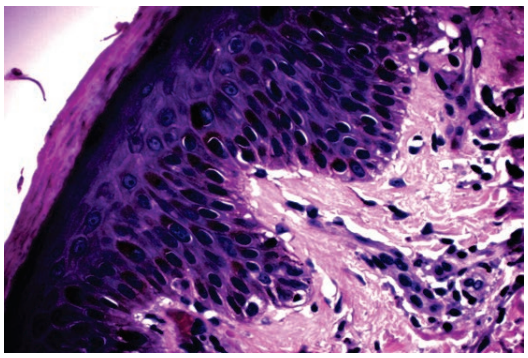

Fig. 4: Focal basal cell vacuolar degeneration (H and E stain, 40X)

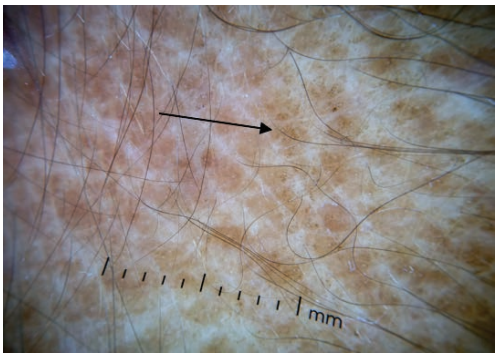

Fig. 5: Brown dots (black arrow) and globules separated by white septae in a random distribution

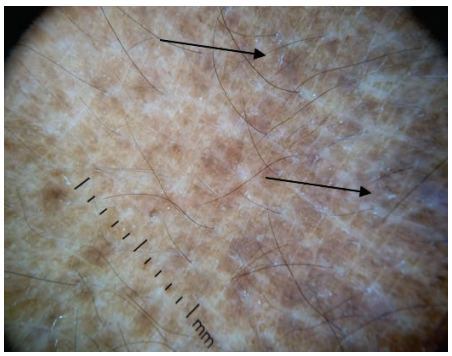

Fig 6: Dots and globules in a brown background with focal fine scaling (black arrows)

DISCUSSIONS

Ashy dermatosis (AD) is an acquired pigmentary disorder of unknown etiology characterised by brownish-bluish grey pigmentation of trunk, limbs and face. It has caused a lot of cosmetic concern and emotional disturbances. It has to be differentiated from other acquired pigmentary disorders like lichen planus pigmentosus, post inflammatory hyperpigmentation, macular amyloidosis etc. In our study, majority of the people were of middle aged. The mean age in the present study is in concurrent with the study by Rutnin *et al*.[4] whereas it is contrary to studies done by Elmas *et al*.[5], Luz *et al*.[6] and Chang *et al*.[7]. In the present study, majority of the patients had Fitzpatrick's skin type. This is in consistent

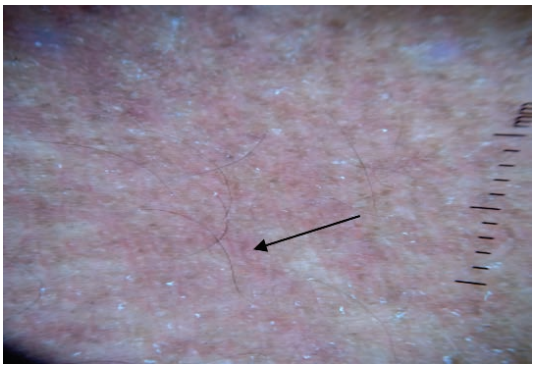

Fig. 7: Dots and globules in a skin-coloured background with focal fine scaling and irregular linear vessels (black arrow)

with the studies done by Rutnin *et al*.[4], Luz *et al*.[6] and Chang *et al*.[7]. In our study, the most common morphology of lesions was brown macules which is contrary to studies by Rutnin *et al*.[4], Elmas *et al*.[5], Luz *et al*.[6], Chang *et al*.[7] and Mittal *et al*.[8] where grey macules were most commonly seen. The most common pattern of pigmentation was diffuse which is in consistent with study by Rutnin *et al*.[4]. The most common site of involvement were upper limbs (70%) which is in contrary to studies by Rutnin *et al*.[4] (face and neck), Luz *et al*.[6] (anterior thorax), Chang *et al*.[7] (trunk) and Mittal *et al*.[8] (face).

On histopathological examination, majority had basal cell vacuolar degeneration, lymphocytic infiltration in dermis and pigmentary incontinence. These findings are in consistent with studies by Rutnin *et al*.[4], Elmas *et al*.[5], Luz *et al*.[6], Chang *et al*.[7] and Mittal *et al*.[8]. On dermoscopy, brown dots and brown globules separated by white septae were present in random distribution, patchy clustered distribution and widespread distribution. The most common colour of the background was brown followed by skin colour and pinkish brown. The most common pattern of vessels was irregular linear followed by dotted and coiled. Other features were focal fine scaling and some non-specific changes. These findings are in contrary to a study by Elmas *et al*.[5] where brown to grey dots and globules were present in irregular linear arrangement and circular arrangement with pinkish brown as most common background. In a study by Vinay *et al*.[9] the dermoscopic features were brown black and bluish grey dots, globules, blotches and telangiectasia arranged in Chinese letter pattern, reticulate and diffuse pattern. In a study by Mittal *et al*.[8] the dermoscopic features were blue black pigmented dots with pale white areas.

In our study, out of 50 patients, both dermoscopic and histopathological findings were present in 43 (86%) patients. Histopathologically, brown dots and brown globules are associated with pigmentary incontinence. Brown colour of the background is due to epidermal melanin. Vessels are thought to be associated with superficial dermal telangiectatic vessels. The association of dermoscopic and histopathological findings in clinically suspected AD patients was 100% and was statistically significant ($p<0.001$). The sensitivity and specificity of dermoscopy against histopathology was 100%. The peculiarity of this study is that we found the association of dermoscopy and histopathology in clinically suspected AD patients and the sensitivity and specificity of dermoscopy against histopathology where no other studies in the literature have demonstrated these findings. Limitations of this study were small sample size and lack of similar studies to compare our results.

CONCLUSION

Ashy dermatosis cannot be diagnosed based on clinical examination alone. A non-invasive diagnostic equipment like a “Dermoscope” is very handy, provides better magnification and can reduce the need of invasive histopathological examination.

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