

A CLINICO-HISTOPATHOLOGICAL STUDY OF FRICTIONAL MELANOSISKeerthi Jampani¹, Swetha Jampani²¹Director, Dermatologist, Department of Dermatology, Sri Sai Nursing Home, Vijayawada.²Director, Department of Obstetrician & Gynaecology, Sri Sai Nursing Home, Vijayawada.**ABSTRACT****OBJECTIVE**

The aim of the present study was to analyse different clinical patterns of frictional melanosis and to evaluate whether sun exposure is a causative or contributing factor for frictional melanosis. Furthermore, histopathology with haematoxylin and eosin along with special stains for amyloid like Congo red was done.

METHODS

50 patients with clinical diagnosis of frictional melanosis participated in this study.

INCLUSION CRITERIA

Patients of all ages and both sexes with classical clinical features suggestive of frictional melanosis are included.

EXCLUSION CRITERIA

Patients having pigmentation over areas where the frictional melanosis presents classically but have been using chemicals, hair dyes and other agents which can cause photocontact dermatitis have been excluded from the study.

A detailed history regarding duration of illness, progression and precipitating factors along with detailed clinical examination regarding the location of the lesions and type of lesions was done and patients were subjected to skin biopsy after obtaining a written consent.

RESULTS

Out of 50 cases, 39 (78%) were confirmed with histopathology as frictional melanosis and 11(22%) as macular amyloidosis. Among patients of frictional melanosis, 56.41% had only skin lesions. In macular amyloidosis 63.63% patients had itching along with skin lesions. In Frictional melanosis the most frequently involved site was extensor aspect of arm (78.48%). The most frequently involved site in macular amyloidosis was extensor aspect of forearm (93.34%).

CONCLUSION

In this study a total number of 50 patients with clinical presentation of frictional melanosis were analysed with female preponderance. Amyloid deposition is seen in those skin biopsy specimens taken from area of friction with sun exposure, which suggests that sun exposure could be one of the predisposing factors for macular amyloidosis. Thus, these findings confirm that frictional melanosis is a variant of macular amyloidosis and histopathological examination will help in confirming the diagnosis.

KEYWORDS

Frictional Melanosis, Macular Amyloidosis, Amyloid, Congo Red.

HOW TO CITE THIS ARTICLE: Jampani K, Jampani S. A clinic-histopathological study of frictional melanosis. J. Evid. Based Med. Healthc. 2016; 3(49), 2465-2468. DOI: 10.18410/jebmh/2016/541

INTRODUCTION: It is very common to see asymptomatic rippled pigmentation over sites which patients usually scrub and over sun exposed areas.

There is a lot of confusion with reference to the terminology itself. Some literature termed this patterned pigmentation over the upper back and clavicular region as zebra – like pattern over the ribs and postage stamp like macule over the vertebral column as frictional melanosis.^[1]

It has been described as variant of macular amyloidosis. In the literature, the same entity has also been described as frictional amyloidosis.^[2]

It has also been described as towel melanosis.^[3] Frictional melanosis has been described as Davener's pigmentation by Naimer in students at Orthodox Jewish Talmudic seminaries (yeshivas). This is attributed to the phenomenon of friction from rigid back rests against the cutaneous surface of the lower back generated by the characteristic swaying activity that traditionally accompanies Torah study or davening (praying) and termed it Davener's dermatosis, it is described as a variant of frictional hypermelanosis.^[4] Various studies have demonstrated that in all such cases amyloid deposits have not been observed.^[5] Frequent involvement of the back, extensor aspects of upper

Financial or Other, Competing Interest: None.
Submission 13-05-2016, Peer Review 02-06-2016,
Acceptance 08-06-2016, Published 18-06-2016.
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DOI: 10.18410/jebmh/2016/541

limbs and clavicular areas compared to sun protected sites like lower back, legs, thighs, buttocks and breast would point to exposure of ultraviolet rays as an aetiological factor in macular amyloidosis.

RESULTS: Out of 50 cases, 39 were of frictional melanosis and 11 were of macular amyloidosis. The involved age group in my study was from 11 – 80 years. The age of the youngest patient with frictional melanosis in my study was 17 years and the age of oldest patient was 75 years. The most frequently involved age group was 21 – 30 years (33.33%). The age of the youngest patient with macular amyloidosis was 25 years and the age of the oldest patient with macular amyloidosis was 74 years. The most frequently involved age group was 31 – 50 years (36.36%). In the present study out of 50 patients, 14(28%) were males and 36(72%) were females. Out of 39 patients of frictional melanosis, 11 were males (28.20 %) and 28 (71.79 %) were females. Among the 11 cases of macular amyloidosis 3 (27.27%) were males and 8 (72.72%) were females which suggests female preponderance. In the present study, majority of patients with frictional melanosis were housewives (46.15%) followed by farmers (28.20%). Among patients of macular amyloidosis, housewives (54.54%) followed by farmers (36.36%), same as in frictional melanosis. Majority of patients in frictional melanosis had duration of 6 months to 1 year (46.15%) and patients with macular amyloidosis had symptoms of duration more than 1 year (72.72%).

Majority of patients with frictional melanosis had only skin lesions (56.41%) but those with macular amyloidosis had both itching and skin lesions (63.63%). The most frequently involved site was extensor aspect of arm with 31 (79.48%) out of 39 cases of frictional melanosis and extensor aspect of forearm was involved in 27 cases (69.23%). The most frequently involved site was extensor aspect of forearm in all 11 cases of macular amyloidosis, followed by extensor aspect of arm, interscapular, neck, pretibial area. Least involvement is that of thighs. Rippled pattern with hyperpigmentation was seen in all 11 cases (100%) of macular amyloidosis and 23 cases of frictional melanosis (58.97%).

Among 39 patients of frictional melanosis, the most frequently observed epidermal changes were hyperkeratosis (100%) and pigmentation of basal cells (100%). Other epidermal changes noted were degeneration of basal cells (17.94%) and ironing of rete ridges (12.82%).

Among 11 patients with macular amyloidosis, the most frequently observed epidermal changes were acanthosis, hyperkeratosis and pigmentation of basal cells accounting for 100% each followed by degeneration of basal cells (90.90%) and ironing of rete ridges (72.72%).

Lymphohistiocytic infiltrate and pigmentary incontinence is seen in all 39 patients with frictional melanosis. Amyloid deposition in papillary dermis along with lymphohistiocytic inflammatory infiltrate and pigmentary incontinence is seen in all 11 patients with macular amyloidosis.

DISCUSSION: In the present study, the commonest age group with frictional melanosis was 21-30 years (33.33%), followed by 41-50 (25.64%) and 11-20 years (10.25%).

In a study done in India, the age of patients varied from 20-60 years in cases of frictional melanosis with a male preponderance.^[6]

In our study, most cases of macular amyloidosis belong to 31-40 years (36.36%) and 41-50 years (36.36%).

In a study in Iran, the commonest age group of macular amyloidosis was 41-50 years (28%) which is consistent with the findings in our study.^{[7],[8]}

In the present study out of 50 patients, 14 (28%) were males and 36 (72%) were females showing a female preponderance which is consistent with other studies.^{[8],[9]} One Indian study; however, observed a male preponderance.^[5]

In our study, 11 (22%) patients of macular amyloidosis had history of sun exposure, whereas in areas of no exposure to sun only frictional melanosis was present which is consistent with one study in India.^[10] It is in contrast to the findings of another study wherein they found no association between sun exposure and macular amyloidosis.^[11]

Most patients in our study gave history of skin lesions lasting for more than one year (72.72%), this is consistent with findings of other studies also where the duration of skin lesions lasted for several years.^[3]

In the present study, majority of patients with frictional melanosis had only skin lesions (54.41%) and majority of patients with macular amyloidosis present with skin lesions associated with itching (63.63%) which is consistent with other studies.^{[6],[12],[13]}

In our study, plastic brush (33.33%) was used as scrub in patients with frictional melanosis and macular amyloidosis which is in contrast to another study wherein they found nylon brush is responsible for the pigmentation and thereby termed it as nylon friction dermatitis.^{[6],[7],[10]}

In the present study, out of 39 (78%) patients of frictional melanosis, 79.48% showed involvement of extensor aspect of arm followed by extensor aspect of forearm (69.23%) and interscapular area (41.02%) which is consistent with other studies.^{[14],[15]}

In our study, out of 11 (22%) patients of macular amyloidosis, 100% showed involvement of extensor aspect of forearms which is in contrast to one study done in Washington, DC where in lower extremities are found to be common location for macular amyloidosis.^[12]

In the present study, hyperpigmentation in ripple pattern was the commonest morphological lesion which is consistent with other studies.^{[10],[16]}

In our study, hyperkeratosis and pigmentation of basal cells was the commonest epidermal change in histopathology.

In the present study, out of total number of 50 cases, 39 (78%) were consistent with frictional melanosis and the rest 11 (22%) showed macular amyloidosis.

Hyperkeratosis and pigmentation of basal cells were seen in all 50 cases (100%). Degeneration of basal cells was seen more in macular amyloidosis (90.90%). In study done by Prabhakara et al, out of total number of 27 cases of frictional melanosis, 16 cases (59.25%) were consistent with frictional melanosis and remaining 11 cases (40.74%) showed macular amyloidosis.^[5]

Clinical type	No. of patients	Percentage
Frictional melanosis	39	78%
Macular amyloidosis	11	22%
Clinical Types		

Out of 50 patients of primary localised cutaneous amyloidosis, 39 were of frictional melanosis (78 %) while 11 were of macular amyloidosis (22%).

Symptoms	Frictional melanosis		Macular amyloidosis	
	No. of patients	Percentage	No. of patients	Percentage
Itching + skin lesions	17	43.58%	7	63.63%
Skin lesions only	22	56.41%	4	36.36%
Symptoms				

Among the patients of frictional melanosis, 56.41% had only skin lesions without associated itching, where as 43.58% had itching along with skin lesions.

In patients with macular amyloidosis, 63.63% of which had itching along with skin lesions, whereas 36.36% had skin lesions alone without itching.

Type of lesions	Frictional Melanosis		Macular amyloidosis	
	No. of patients	Percentage	No. of patients	Percentage
Rippled Pattern	1	2.56%	0	0%
Hyperpigmentation	10	25.64	0	0%
Lichenification	0	0%	0	0%
Confluent pigmentation	2	5.12%	0	
Rippled pattern+ hyperpigmentation	23	58.97%	11	100%
Papular	0	0%	0	0%
Confluent+ hyperpigmentation	3	7.69%	0	0%
Morphology of Lesions				

Rippled pattern with hyperpigmentation was seen in all 11 cases (100%) of macular amyloidosis and in 23 cases of frictional melanosis (58.97%).

Epidermal changes	Frictional Melanosis		Macular amyloidosis	
	No. of patients	Percentage	No. of patients	Percentage
Acanthosis	5	12.82%	11	100%
Hyperkeratosis	39	100%	11	100%
Ironing of rete ridges	5	12.82%	8	72.72% %
Degeneration of basal cells	7	17.94%	10	90.90%
Pigmentation of basal cells	39	100%	11	100%
Epidermal Changes in Histopathology				

Among 39 patients of frictional melanosis, the most frequently observed epidermal changes were hyperkeratosis (100%) and pigmentation of basal cells (100%). Other epidermal changes noted were degeneration of basal cells (17.94%) and ironing of rete ridges (12.82%).

Among 11 patients with macular amyloidosis, the most frequently observed epidermal changes were acanthosis, hyperkeratosis and pigmentation of basal cells accounting for 100% each followed by degeneration of basal cells (90.90%) and ironing of rete ridges (72.72%).

Dermal changes	Frictional melanosis		Macular amyloidosis	
	No. of patients	Percentage	No. of patients	Percentage
Amyloid in papillary dermis	-	-	11	100%
Lymphohistiocytic inflammatory infiltrate	39	100%	11	100%
Pigment incontinence	39	100%	11	100%
Dermal Changes in Histopathology				

Lymphohistiocytic inflammatory infiltrate and pigmentary incontinence is seen in all 39 patients with frictional melanosis.

Amyloid deposition in papillary dermis along with lymphohistiocytic inflammatory infiltrate and pigmentary incontinence is seen in all 11 patients with macular amyloidosis.

CONCLUSION:

- Out of 50 cases, 39 (78%) were diagnosed as frictional melanosis and 11 (22%) as macular amyloidosis.
- Majority of the patients with frictional melanosis were in age group of 21-30 years (33.33%). In macular amyloidosis frequently involved age group was 31-50 years (36.36%).
- Housewives were the most frequently involved group in both frictional melanosis and macular amyloidosis.
- Majority of the patients in frictional melanosis had symptoms of duration 6 months to 1 year (46.15%). Among patients with macular amyloidosis, majority had symptoms of duration more than 1 year (72.72%).
- Among the patients of frictional melanosis, 56.41% had only skin lesions. In macular amyloidosis, 63.63% patients had itching along with skin lesions.
- In frictional melanosis, plastic brush was used for scrubbing in majority (33.33%) followed by sponge, coir and pumice stone. In macular amyloidosis, 45.45% used plastic brush and coir.
- In frictional melanosis, the most frequently involved site was extensor aspect of arm (79.48%). The most frequently involved site in macular amyloidosis was extensor aspect of forearm (93.34%).
- Pigmentation was seen in all cases of frictional melanosis and macular amyloidosis. Rippled pigmentation was seen in all 11 cases (100%) of macular amyloidosis and in 23 cases (58.97%) of macular amyloidosis.
- The most frequently observed epidermal changes in frictional melanosis were hyperkeratosis (100%) and pigmentation of basal cells (100%), followed by degeneration of basal cells (17.94%) and ironing of rete ridges (12.82%). The dermal changes include lymphohistiocytic inflammatory infiltrate and pigmentary incontinence.
- The most frequently observed epidermal changes in macular amyloidosis were acanthosis, hyperkeratosis and pigmentation of basal cells accounting 100% each followed by degeneration of basal cells (90.90%) and ironing of rete ridges (72.72%).
- Amyloid deposits in papillary dermis along with lymphohistiocytic inflammatory infiltrate and pigmentary incontinence were seen in all cases with macular amyloidosis.
- In this study, a total number of 50 patients with frictional melanosis were analysed with a female preponderance and more common in the second and third decades. Most patients gave history of scrubbing with a false belief that scrubbing will remove dirt. The extensor aspect of the arm was more commonly involved showing characteristic rippled pattern of hyperpigmentation with amyloid deposits in the papillary dermis in cases of macular amyloidosis. Amyloid deposition is seen in those skin biopsy specimens taken from area of friction with sun

exposure, which suggests that sun exposure could be one of the predisposing factor for macular amyloidosis.

- Thus, these findings confirm that frictional melanosis is a variant of macular amyloidosis and histopathological examination will help in confirming the diagnosis.

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