Original Article

An Observational Study of Cutaneous Manifestations in Internal Malignancy at Tertiary Care Centre

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Abstract

Introduction: Skin is the largest organ in the human body and mirrors the changes in the organism it envelops. Internal malignancies can cause various specific and non-specific cutaneous manifestations along with hair, nail and oral mucosal changes. Some of the changes are detected early indicating a strong association with cancer, while some occur in later stage indicating dissemination or immunosuppression. The present study is an effort to know pattern of dermatosis associated with internal malignancies so that early diagnosis and interventions can be done. **Aim:** To determine the pattern of specific and non-specific dermatosis associated with internal malignancy. **Methods and Material:** Patients of internal malignancies with skin lesions attending dermatology and oncology department during July 2020 to June 2021 were recruited in the study after taking written informed consent. A detailed history of skin lesions and malignancies were taken. Clinical examination (skin/hair/nail) was carried out and photographs were taken. Relevant investigations were carried out. Frequency and percentage of dermographic data and dermatosis associated with internal malignancies were calculated. **Results:** The study included 150 patients with maximum number of patients 78 (52%) in 41-60 years of age group with female: male ratio of 1.2:1. Most common internal malignancy was breast carcinoma in 43 (28.67%) cases. Specific dermatosis were seen in 5 (3.33%) cases and non-specific dermatosis in 121 (80.66%) cases. Specific dermatosis were vasculitis, necrolytic migratory erythema, lymphocytoma cutis, growth and cutaneous metastasis with 1 (0.67%) patient each. Most common non-specific dermatosis was herpes zoster in 17 (11.33%) cases. **Conclusion:** The study was useful in understanding the various specific and non specific dermatosis associated with internal malignancies and thereby helping the physician to manage the conditions.

Keywords: *Breast carcinoma, cutaneous metastasis, herpes zoster, internal malignancies*

Introduction

The skin being the largest organ in the human body has the ability to mirror the changes in the organism it envelops.[1] Different types of cancers cause cutaneous manifestations, which may be primary or secondary to an underlying malignancy. They are noticed concurrently with the diagnosis or following an established diagnosis.[2] The malignant tumor has the ability to produce secondary deposits or metastasis at distant sites. The skin is an uncommon site for metastasis and indicates late stage of internal malignancy.[3] The incidence varies from 0.7 to 10.4% as per different studies.[4]

Looking at the incidence of internal malignancy which is high, their early diagnosis and intervention are the foremost steps to be carried for a better prognosis. A study was conducted with the objective to describe specific and nonspecific cutaneous manifestations of malignancies along with hair, nail and oral mucosal changes.

Materials and Methods

It was a cross sectional observational study, approved by institutional ethical committee with the reference -IEC/HMPCMCE/118/Faculty/15/83/2020. All diagnosed cases of internal malignancies with skin manifestations attending Oncology OPD/wards, Dermatology OPD/wards during July 2020 to June 2021 were included. Children below 18 years of age, pregnant and lactating mothers and patients who were not ready to give a written consent were excluded from the study. A detailed history was recorded in pre-structured proforma to collect demographic data, past and family history, complaints of patients

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in terms of onset, duration and progression of cutaneous lesions. History regarding carcinomas, its duration and interval between diagnosis and cutaneous lesions was also noted. Clinical examination (skin/hair/nail) was carried out and photographs were taken after taking consent in vernacular language. Relevant investigations (Hb/Vit B12/ Histogram/DC/CRP/ESR/Serology/LFT/RFT/Bloodsugar/ Lipid Profile/Dermoscopy/Biopsy/KOH/) were carried out as and when required.

Statistical analysis

This being a descriptive cross sectional observational study, age group wise and gender wise frequency and percentage were calculated for malignancies and dermatosis.

Results

One hundred and fifty cases with internal malignancies were recruited, of which 68 (45.33%) patients were males and 82 (54.67%) patients were females with female to male ratio of 1.2:1. The most common age group was 41-60 years with 78 (52%) cases [Table 1]. Fifty two (34.67%) patients were illiterate, followed by 51 (34%) patients who were graduate. A maximum of 68 (45.33%) patients were homemakers, and 24 (16%) patients were labourer. Total 87 (58%) patients were from middle, and 50 (33.33%) patients were from lower socio-economic status. Systemic drugs were the most common precipitating factor in 110 (73.33%) followed by topical preparations in 15 (10%) patients. Past history of surgery was present in 64 (42.67%) cases followed by diabetes mellitus in 43 (28.67%) cases. Family history of diabetes mellitus in eight (5.33%) cases and hypertension and malignancy in 6 (4%) cases each was present.

Overall the most common internal malignancy was breast carcinoma in 43 (28.67%) patients, while in males it was buccal mucosal carcinoma in 20 (29.41%) patients and in females, it was breast carcinoma in 43 (52.44%) patients [Figure 1]. Breast was the most common primary site of internal malignancy in 42 (28%) cases followed by buccal mucosa in 18 (12%) cases. [Figure 2]

The average duration of malignancy was 1 month to 3 months in 37 (24.67%) cases. Average duration of dermatosis was 10 days in 71 (47.33%) cases and the average duration between development of cutaneous lesions and internal malignancy was 1 month to 3 months in 40 (26.67%) cases [Table 2]. Metastasis was present in 16 (10.67%) malignancies and the most common site of metastasis was lymph node (5.33%)s, followed by bones (3.33%), and lungs (2%). Ninety-six (64%) patients complained about itching, followed by black discolouration of skin in 59 (39.33%) patients [Figure 3].

Specific dermatosis was present in 5 (3.33%) cases only and non-specific dermatosis in 121 (80.66%) cases. In specific dermatosis, one (0.67%) case each of vasculitis, necrolytic migratory erythema [Figure 4], lymphocytoma cutis [Figure 5], growth and cutaneous metastasis [Figure 6] was seen. We divided non-specific dermatoses into infective (23.33%), dermatitis (21.33%), pigmentary (5.33%) and miscellaneous dermatoses (30.66%). Herpes zoster was the most common non-specific dermatosis in 17 patients followed by contact allergic dermatitis in 14 and pruritus in 13 patients [Table 3]. Overall nail changes were present

Table 1: Age and gender wise distribution

Age (years)	Gender		Total
	MALE	FEMALE	
19-40	1 (1.47%)	14 (17.07%)	15 (10%)
41-60	33 (48.53%)	45 (54.88%)	78 (52%)
>60	34 (50%)	23 (28.05%)	57 (38%)
Total	68 (45.33%)	82 (54.67%)	150 (100%)

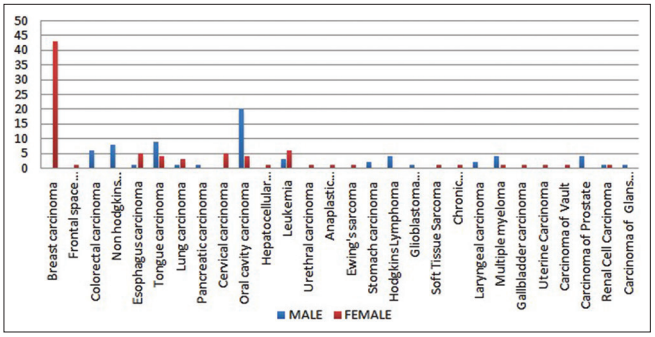

Figure 1: Gender wise distribution of internal malignancies

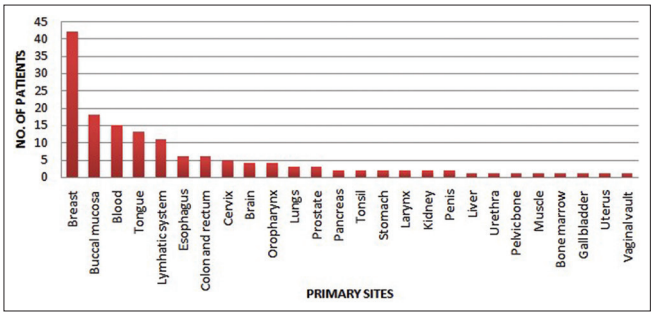

Figure 2: Primary site of internal malignancies

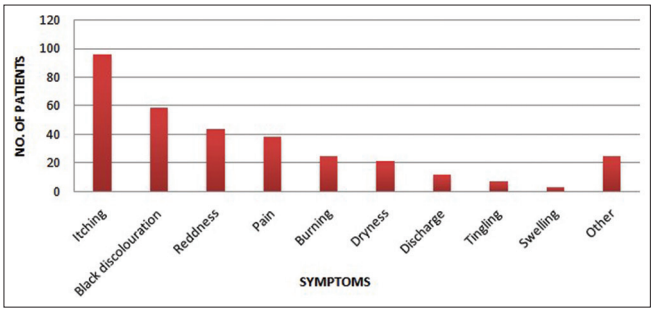

Figure 3: Symptoms associated with dermatoses

in 75 (50%) patients, hair changes in 32 (21.33%) and oral mucosal changes in 28 (18.67%) patients of which melanonychia was present in 42 (28%), anagen effluvium in 29 (19.33%) and aphthous ulcer in 14 (9.33%) cases. [Table 4]

Discussion

Cutaneous lesions may be purely due to direct tumor invasion of the skin or due to distant metastasis as a part of paraneoplastic phenomena, which can be divided

Table 2: Duration of internal malignancies, dermatoses and between internal malignancy and appearance of cutaneous lesions

Duration	Duration of internal malignancies No. of patients (%)	Duration of dermatosis No. of patients (%)	Duration between internal malignancy and appearance of cutaneous lesions No. of patients (%)
<10 days	2 (1.33%)	71 (47.33%)	7 (4.67%)
11 days to 1 month	14 (9.33%)	45 (30%)	16 (10.67%)
1 month – 3 months	37 (24.67%)	20 (13.33%)	40 (26.67%)
3 months -6 months	24 (16%)	5 (3.33%)	21 (14%)
6 months-1 year	31 (20.67%)	4 (2.67%)	34 (22.67%)
1 year-3 years	32 (21.33%)	3 (2%)	25 (16.67%)
>3 years	10 (6.67%)	2 (1.33%)	7 (4.67%)
Total	150 (100%)	150 (100%)	150 (100%)

Figure 4: Multiple, diffuse, erythematous non blanchable patches suggestive of necrolytic migratoty erythema in a case of pancreatic carcinoma over (a) bilateral palms, (b) bilateral lower limbs (c) right sole

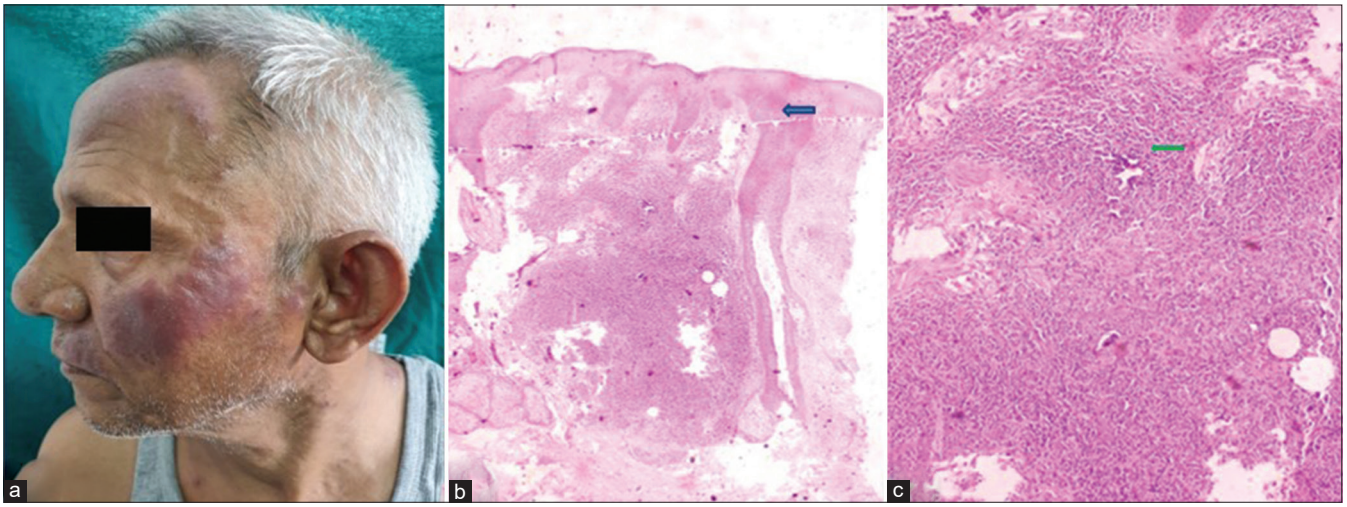

Figure 5: (a) Two to three, well defined, erythematous, infilterated plaques suggestive of Lymphocytoma cutis in a case of B-cell Non-Hodgkin's lymphoma over left forehead and cheek (b and c) Mildly acanthotic epidermis (blue arrow) and well demarcated lymphoid aggregate with germinal centre (green arrow), tingible body macrophages and vessels in upper dermis. (H and E stain-4X,40X)

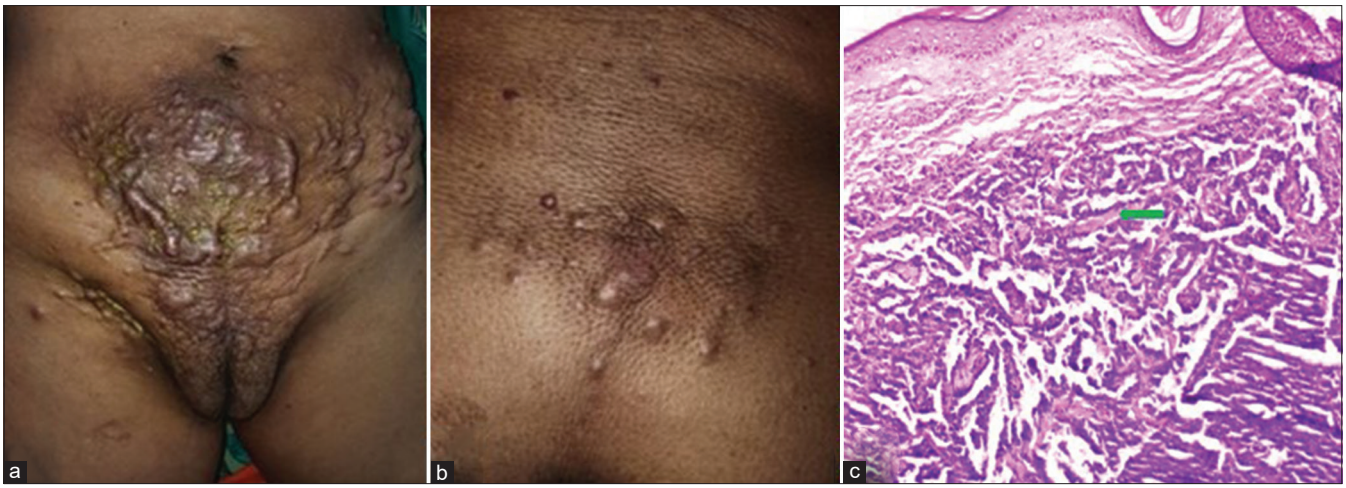

Figure 6: Multiple, skin coloured infilterated papules and nodules suggestive of cutaneous metastasis in vault carcinoma over (a) lower abdomen and (b) lower back (c) Moderately pleomorphic, round to oval malignant epithelial cells with vesicular chromatin, minimal to moderate eosinophilc cytoplasm, arranged in papillary and micropapillary pattern with central fibrovascular area. (H and E stain-10X)

Table 3: Non-specific dermatoses

	Dermatoses	Gender		Total
		Male	Female	
Infective dermatoses	Herpes zoster [Figure 7]	5 (7.35%)	12 (14.63%)	17 (11.33%)
	Fungal infection	4 (5.88%)	3 (3.66%)	7 (4.67%)
	Furuncles	1 (1.47%0	5 (6.10%)	6 (4%)
	Scabies	1 (1.47%)	1 (1.22%)	2 (1.33%)
	Warts	0 (0%)	2 (2.44%)	2 (1.33%)
	Secondary bacterial infections	0 (0%)	1 (1.22%)	1 (0.67%)
	Total	11 (16.17%)	24 (29.26%)	35 (23.33%)
Dermatitis	Contact allergic dermatitis	8 (11.76%)	6 (7.32%)	14 (9.34%)
	Contact irritant dematitis	2 (2.94%)	5 (6.10%)	7 (4.67%)
	Exfoliative dermatitis	5 (7.35%)	1 (1.22%)	6 (4%)
	Seborrheic dermatitis	1 (1.47%)	1 (1.22%)	2 (1.33%)
	Photodermatitis	1 (1.47%)	0 (0%)	1 (0.67%)
	Scrotal dermatitis	1 (1.47%)	0 (0%)	1 (0.67%)
	Friction dermatitis	1 (1.47%)	0 (0%)	1 (0.67%)
	Total	19 (27.94%)	13 (15.85%)	32 (21.33%)
				0.
Pigmentary dermatoses	Post inflammatory hyperpigmentation	1 (1.47%)	6 (7.32%)	7 (4.67%)
	Perioral pigmentation	0 (0%)	1 (1.22%)	1 (0.67%)
	Total	1 (1.47%)	7 (8.53%)	8 (5.33%)
Miscellaneous dermatoses	Pruritus	5 (7.35%)	8 (9.76%)	13 (8.67%)
	Xerosis	2 (2.94%)	8 (9.76%)	10 (6.67%)
	Post herpetic neuralgia	3 (4.41%)	3 (3.66%)	6 (4%)
	Urticaria	4 (5.88%)	1 (1.22%)	5 (3.33%)
	Pemphigus vulgaris [Figure 8]	0 (0%)	2 (2.44%)	2 (1.33%)
	Pellagra	0 (0%)	2 (2.44%0	2 (1.33%)
	Prurigo simplex [Figure 9]	0 (0%)	2 (2.44%0	2 (1.33%)
	Seborrheic keratosis	0 (0%)	1 (1.22%0	1 (0.67%)
	Keloid	1 (1.47%)	0 (0%)	1 (0.67%)
	Lichen sclerosus et atrophicus	0 (0%)	1 (1.22%)	1 (0.67%)
	Pyogenic granuloma [Figure 10]	0 (0%)	1 (1.22%)	1 (0.67%)
	Angiokeratoma [Figure 11]	1 (1.47%)	0 (0%)	1 (0.67%)
	Darier's disease [Figure 12]	1 (1.47%)	0 (0%)	1 (0.67%)
	Total	17 (25%)	29 (35.36%)	46 (30.66%)

Figure 7: Multiple, grouped vesicles over erythematous bases over left lower chest involving T5, T6 dermatomes suggestive of Herpes zoster in a patient of non-Hodgkin lymphoma

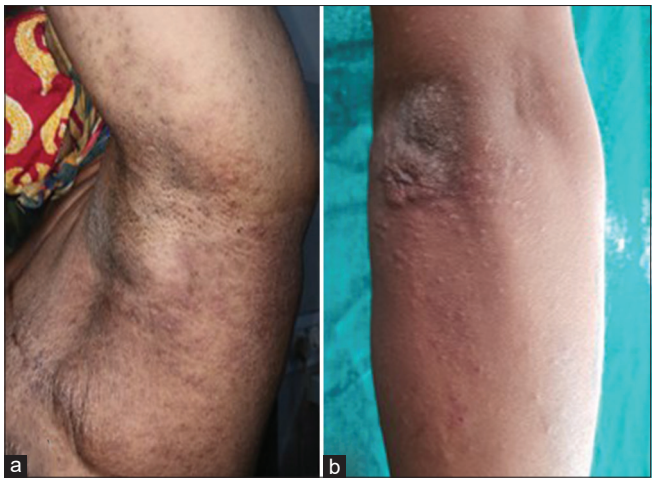

Figure 9: A case of breast carcinoma presenting with multiple skin coloured papules over (a) axilla (b) right elbow and extensor suggestive of Prurigo simplex

Figure 8: A case of carcinoma of esophagus presented with multiple, clear fluid filled bullae over (a) abdomen and periumbilical region with (b) oral candidiasis and fissured tongue suggestive of pemphigus vulgaris

Figure 10: A case of breast carcinoma with single erythematous soft nodule of size 0.5 cm in diameter with surrounding erythema, edema and crusting over lateral and proximal nail fold of right great toe suggestive of Pyogenic granuloma

as specific or nonspecific. Curth postulate has been described to know the association between internal malignancies and its cutaneous features or paraneoplastic dermatosis.

Advancing age is the most important risk factor for cancer and risk for all cancers increases with age, up to 70 years of age and then decreases.[5] In present study, out of 150 cases with internal malignancies, most common age group was 41-60 years with 52% cases similar to Menon *et al*.[6] and Muralidhar *et al*.[7] studies. In our study, female predominance was observed with 54.6% cases comparable with study by Kilaru *et al.*,[8] Biswal *et al.*,[9] Pavey *et al*.[10] and Muralidhar *et al*.[7]

Educated people present at an earlier stage due to increase in awareness among them and regular health check-ups.[11] In present study, 34.67% patients were illiterate followed by 34% patients who were graduate. Outdoor workers have the highest risk of lip cancer, while the lowest risk was found among indoor workers. Increased risk of nasal cancer with exposure to wood dust and bladder cancer with use of occupational carcinogens have been found.[12] In our study, 45.33% patients were homemakers followed by 16% patients who were labourers. People with higher income are less likely to suffer from cancer related late complications, morbidity and mortality due to early presentation to the hospital and availability of better diagnostic and therapeutic modalities.[11] Total 87 (58%) patients belonged to middle

Figure 11: Multiple blue-red papules over scrotum suggestive of angiokeratoma of Fordyce in a patient with carcinoma prostate

Table 4: Nail, hair and oral mucosal changes

	Dermatosis	No. of patients (%)
Nail changes (*n*=75)	Melanonychia	42 (28%)
	Dystrophy	16 (10.66%)
	Pitting	5 (3.33%)
	Thinning	5 (3.33%)
	Yellow nails	5 (3.33%)
	Paronychia	5 (3.33%)
	Thickening	4 (2.67%)
	Splitting	2 (1.33%)
	Mee'slines	1 (0.67%)
	Muehrcke's lines	1 (0.67%)
	Pterygium	1 (0.67%)
	Leukonychia	1 (0.67%)
	Onychomycosis	1 (0.67%)
Hair changes (*n*=32)	Anagen effluvium	29 (19.33%)
	Loss of eyebrow hair	7 (4.67%)
	Seborrhoea	3 (2%)
Oral mucosal changes (*n*=28)	Aphthous ulcer	14 (9.33%)
	Hyperpigmentation	10 (6.67%)
	Oral candidiasis	6 (4%)
	Oral lichen planus	1 (0.67%)
	Cheilitis	1 (0.67%)

socio-economic status. These parameters had not been mentioned in any of the studies.

Cancer is one of the most important causes of death and morbidity in both developed and developing parts of the world. Cancer burden is estimated to grow exponentially in the future. There are over 200 types of cancer, but still many facts are unknown about the disease.[7] In India, the five most common cancers in both sexes are cancers of

Figure 12: Multiple, hyperpigmented dirty warty papules involving lower abdomen and bilateral groins suggestive of Darier's disease in a case of multiple myeloma

the breast (14.3%), cervix uteri (12.1%), lip-oral (7.6%), lung (6.9%) and colorectum (6.3%), comprising 47.2% of the 28 cancers reported.[13] In our study, the most common malignancy in all age groups was breast carcinoma in 28.67% cases followed by buccal mucosal carcinoma in 16% cases, similar to Fabbrocini *et al.*,[14] Naveed *et al.*,[15] Pavey *et al.*[10] and Muralidhar *et al.*[7] studies. This is particularly because of more female predominance in our study. This is in contrast to studies by Ayyamperumal *et al.*,[16] Hassan *et al.*,[13] Kilaru *et al.*,[8] Biswal *et al.*[9] and Menon *et al.*[6] where other malignancies were found to be more common [Table 5].

Patients with addictions of smoking and tobacco chewing are more prone to develop oral carcinomas. In India, men are two to four times more affected than women due to the differences in the behavioral and lifestyle patterns.[17] In present study, the most common malignancy seen in males was buccal mucosal carcinoma with 29.41% cases followed by tongue carcinoma with 13.24% cases. Breast carcinoma is the most common female cancer worldwide with an estimated 2.3 million new cases diagnosed in 2020.[18] In present study, the most common malignancy seen in females was breast carcinoma (52.44%). Gender wise comparison of most common internal malignancies in different studies is tabulated [Table 5].

Most common primary site of malignancy in our study was breast with 28% cases.

The average duration of malignancy in present study was 1 month to 3 months with 24.67% patients whereas in Hassan *et al.*[13] duration of malignancy ranged from 1 month to 4 years. Contiguous metastasis are most common in carcinoma of breast and oral cavity which is associated with recurrence of malignancy after surgery.[4] In our study 10.67% cases had metastasis of primary malignancy with

Table 5: Comparison of common internal malignancies and associated dermatoses:

Parameter	Our study (150)	Ayyamperumal *et al.*[16] (750)	Hassan *et al.*[13] (250)	Kilaru *et al.*[8] (50)	Rajagopal *et al.*[19] (300)	Biswal *et al.*[9] (100)	Fabbrocini *et al.*[14] (100)	Menon *et al.*[6] (100)	Naveed *et al.*[15] (226)	Pavey *et al.*[10] (53)	Muralidhar *et al.*[7] (106)
Most common malignancy	Breast carcinoma (28.67%)	Leukemia, lymphoma (19.2%)	Colorectal carcinoma (20%)	Cervical carcinoma	-	Genitourinary malignancy (24.1%)	Breast carcinoma (45%)	Oropharyngeal carcinoma (24%)	Breast carcinoma (28.31%)	Breast carcinoma (22.64%)	Breast carcinoma (13%)
Most common malignancy in males	Buccal mucosal carcinoma (29.41%)	Non-hodgkins lymphoma (26.47%)	-	-	Lymphoma (8.6%)	-	-	Oropharyngeal carcinoma (22%)	-	-	-
Most common malignancy in females	Breast carcinoma (52.44%)	Breast carcinoma (38.88%)	-	-	Breast carcinoma (10%)	-	-	Breast carcinoma (18%)	-	-	-
Specific dermatosis	5 (3.35%)	-	-	-	6.3%				-		
Most common specific dermatosis	Vasculitis, necrolytic migratory erythema, lymphocytomacutis, growth, cutaneous metastasis (0.67%)	Acquired ichthyosis (5%)	-	Paraneoplastic dermatosis (82%)	-				-		
Non-specific dermatosis	121 (80.66%)	4.26%	-	18%	24.6%				-		
Most common non-specific dermatosis	Herpes zoster (11.33%)	Herpes zoster (1.46%)	Xerosis, Herpes zoster (24%)	Pruritus (22%)	Herpes zoster (4%)				-		
Cutaneous metastasis	1 (0.67%)	2.66%	-	6%	8.2%				-		

lymph nodes being the most common site in 5.33% cases lower than Hassan *et al*.,[13] and Kilaru *et al*.[8] with 21.2% and 6% cases respectively. In Hassan *et al*.[13] hepatic metastasis (50.94%) was the most common.

The cutaneous manifestations of internal malignancies are numerous and heterogeneous. It may be a result of metastasis to the skin or from chemicals or hormones secreted by the tumor, resulting in cutaneous syndromes or inflammatory dermatosis, either benign or malignant proliferative lesions. These cutaneous lesions represent only the tip of the iceberg.[19]

In present study, 47.33% patients had skin lesions within 10 days followed by 30% patients who had skin lesions since 11 days to 1 month. Duration between malignancy and appearance of skin lesion ranging from 1 to 3 months was seen in 26.67% patients in our study while in study by Hassan *et al*.[13] the onset of skin changes ranged from 30 days to 3 years.

In present study, 64% patients complained about itching followed by black discoloration of skin seen in 39.33% patients. The most common precipitating factor in our study was systemic drugs with 73.33% cases followed by topical application in 10% cases.

Patients with history of co-morbidities, on immunosuppressive drugs or having history of surgery or previous malignancies are more likely to suffer from internal malignancies as they are prone to infections and have suppressed immunity as compared to normal controls. Patients with family history of malignancies and other co-morbidities are more likely to be diagnosed with malignancies because of inherited pattern of malignancies and hereditary autoimmunity. In present study, past history of surgery was present in 42.67% cases followed by diabetes mellitus in 28.67% cases. Family history of diabetes mellitus was observed in 5.33% cases followed by hypertension and malignancy in 4% cases each.

Specific dermatosis associated with malignancy are due to cutaneous metastasis, or as a part of any syndrome which includes proliferative and inflammatory dermatosis, geno dermatosis, inherited immunodeficiency syndromes or tumor secreting hormones. Some of the changes are detected early which indicates a strong association with cancer, while some changes occur late in the course of the malignancy indicating dissemination or immunosuppression.[13] In present study, specific dermatosis were present in 3.35% cases almost similar to the study by Rajagopal *et al*.[19] with 6.3% cases. Specific dermatosis in our study were vasculitis in a case of multiple myeloma,[20] necrolytic migratory erythema in pancreatic carcinoma, lymphocytoma cutis in B-cell Non-Hodgkin's lymphoma, growth in buccal mucosal carcinoma and cutaneous metastasis of primary vault carcinoma with 0.67% cases each which is in contrast to study by Ayyamperumal *et al*.[16] and Kilaru *et al*.[8] [Table 5] Cutaneous metastasis can arise at any age and early recognition helps in prolonging duration of survival. The interval between the onset of symptoms of the primary malignancy and cutaneous metastasis range from 2 months to 5 years[16] and the favored sites for distant metastasis are trunk and scalp.[19] Cutaneous metastasis as the first sign of internal malignancy has been reported in carcinoma lung, hepatocarcinoma, renal adenocarcinoma, adenocarcinoma esophagus as well as malignant histiocytic lymphomas.[19] Cutaneous metastasis in other studies has been tabulated [Table 5]. In Hassan *et al*.[13] only two patients with cutaneous metastasis (0.8%) were seen similar to our study. In Rajagopal *et al*.[19] one case of histiocytic lymphoma and one case of non-Hodgkin's lymphoma showed cutaneous metastasis as the first sign of underlying malignancy.

The non-specific dermatosis are not directly related to malignancies but are due to immunosuppression, infection or some other unrelated mechanisms. In present study, non-specific dermatosis were present in 80.66% cases which is higher than other studies [Table 5].

According to literature, disseminated herpes zoster is commonly associated with underlying malignant disease.[16] Both herpes zoster and malignancy are associated with immunosuppression and patients with impaired cell-mediated immunity and on chemotherapy are at increased risk of herpes zoster.[21] In our study, most common non specific dermatosis was herpes zoster with 11.33% cases as compared to other studies in table [Table 5]. Generalized xerosis and pruritus are common cutaneous manifestations of advanced malignant disease.[8] Abnormal keratinocyte differentiation leads to an impaired sebaceous gland function and loss of ability to retain water.[7] In our study pruritus was present in 8.67% cases which is the third most common non specific dermatosis similar to studies done by Ayyamperumal *et al*.[16] and Rajagopal *et al*.[19] where pruritus was the second and the third common manifestation respectively. In present study xerosis was present in 6.67% cases lower than studies by Menon *et al*.[6] (26%), Pavey *et al*.[10] (22.2%) and Fabbrocini *et al*.[14] (41.7%).

Certain hair, nail and oral mucosal changes are associated with internal malignancies with different patterns of growth, size, colour and thickness of hair and nail involvements. Anagen effluvium is loss of hair in their growing anagen phase, which is due to either malignancy or chemotherapy and radiation therapy, that impairs the mitotic and metabolic activity of hair follicle. Other hair changes can be scarring and nonscarring alopecia, changes in hair texture (brittle, fine, curly), slower growth of scalp hair, trichomegaly of eyelashes, and hypertrichosis of facial hair. Malignancies and chemotherapeutic drugs can induce nail abnormalities resulting from damage to nail matrix, nail bed, periungual tissues or digital blood vessels.[13]

Oral mucosal changes can be either due to underlying malignancies, any systemic disease or infections.

In our study hair changes were present in 21.33% cases, higher than study by Hassan *et al*.[13] (13.2%) and lower than study by Naveed *et al*.[15] (70.35%). Anagen effluvium was the most common hair condition in 19.33% patients in contrast to study by Hassan *et al*.[13] where telogen effluvium was most common (12.8%). In present study nail changes were observed in 50% cases, higher than Hassan *et al*.[13] study (12.8%) and lower than study by Naveed *et al*.[15] (85.84%). Among nail changes melanonychia was most common in 28% cases in our study similar to studies by Hassan *et al*.[13] and Rajagopal *et al*.[19] Oral mucosal changes were present in 18.67% patients with aphthous ulcers being the most common with 9.33% cases in our study similar to study by Naveed *et al*.[15] with 18.3% cases and higher than study by Hassan *et al*.[13] with 1.6% cases.

Examination of the skin is an essential part of the complete physical examination and may be useful for monitoring the activity and response of treatment. Skin involvement in cancer patients may be unrelated to malignancies, and may be an inherited syndrome featuring an increased incidence of internal cancer.

Conclusion

The study was useful in understanding various specific and non specific dermatosis associated with internal malignancies and thereby helping the physician to effectively manage the conditions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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