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RESEARCH ARTICLE

A CLINICO-EPIDEMIOLOGICAL STUDY ON PALMOPLANTAR DERMATOSES

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Abstract

Background: Dermatoses affecting the palms and soles are more common in our day-to-day practice, because they are most frequently exposed to various allergens, mechanical stress and infectious agents than any other parts in our body. Apart from the diagnostic difficulties, few palmoplantar dermatoses cause great discomfort and disability and may also affect a person's livelihood.

Aim: To study the clinical features and frequency of involvement of various palmoplantar dermatoses and their epidemiological aspects like age, sex distribution and occupation.

Methodology:100 patients with palmoplantar dermatoses diagnosed clinically attending the OPD in our Department, from 1st March 2021– 31st August 2022 were included in the study. Patients with complaints primarily pertaining to palms and soles with or without involvement of other body parts of all ages and both sexes were enrolled in the study. Investigations such as direct microscopic examination of scrapings, wet mount with potassium hydroxide, Wood's lamp examination, patch testing and sample for biopsy was taken. After taking consent, a detailed history and clinical examination pertaining to the aim of the study was recorded and analysed.

Results:A total of 100 patients were enrolled, among which 63 were males and 37 were females. The most common age group affected was 17-40 years. Seasonal variation was reported in 41% of patients. The most common symptom was pruritis. Eczema was the most common palmoplantar dermatoses, followed by psoriasis and fungal infections. Majority of patients had involvement of both palms and soles.

Conclusion: Palmoplantar dermatoses are very frequently encountered in the dermatologic field. Early recognition of clinical symptoms and signs aids in diagnostic investigations and helps in appropriate and effective management of illness to improve the quality of life. This study highlights the need for comprehensive studies in palmoplantar dermatoses.

Introduction:-

Palms andsoleshaveanon-hairyor glabrous skin whichis markedby a series ofridges and grooves(sulci) with a configuration unique to each individual known as Dermatoglyphics.[1] They have thicker epidermis, complex dermo-

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epidermaljunction and an encapsulated sense organs within dermis and highest concentration of sweat glands but lacks sebaceous glands, apocrine glands and hair follicles.

Palms and soles are affected by various dermatological diseases. There is no universally approved classification for palmoplantar dermatoses. They can be classified based upon the causes into inflammation, infection, papulo-squamous and keratinization disorders.

Table:- ClassificationofPalmoplantarDermatoses.

CONDITIONS	DISEASES
INFLAMMATION	Eczema-irritant,allergic,atopic,endogenous Erythema multiforme IDreaction
INFECTIONS	Bacterial–PittedKeratolysis,Intertrigo,Sec.syphilis, leprosy Viral–Wart,HandFootMouthDisease Fungal-Dermatophytosis,Candidiasis
PAPULOSQUAMOUS DISORDERS	Palmoplantar psoriasis, Lichenplanuspalmoplantaris
KERATINIZATION DISORDERS	Palmoplantarkeratoderma, Keratolysis exfoliative
MECHANICAL INJURY	Trophiculcer,Corn,Callosities,Traumaticfissures,Friction blisters Talon noir Piezogenicpedalpapules
DRUGREACTION	Acralerythema
DISORDERSOF SWEATGLAND	Hyperhidrosis
AUTOIMMUNE DISORDERS	Bullouspemphigoid(dyshydrosiformvariant)
MALIGNANCY	Tripe palm Acralmelanoma

'Eczema'and'dermatitis'areinterchangeable terms. Theword'eczema'comesfrom the Greek word, which means 'to boil'.Eczema is a clinical and histological pattern of inflammation of the skin. The cause for this reaction pattern is broad. It is characterizedby erythema, vesiculation in acute stage and lichenification and fissuring in the chronic stage.[2] Eczema confined to palms and dorsal aspect of handsare known as hand eczema and those restricted to palmar region alone is known aspalmar eczema. Morphological classification of eczema include Dyshidroticeczema/Pompholyx, Hyperkeratoticeczema, Finger tipeczema, Ringeczema, Aproneczema, Recurrentfocalpalmarpeeling, Housewivesdermatitis, Chronic acral dermatitis, Patchyvesiculosquamouseczema and Gut/slaughterhouseeczema

Psoriasis is a T cell mediated, chronic inflammatory disorder of the skin. It is characterizedbywelldefined,erythematouspapuleorplaquewithsilverywhitescales on the surface. Psoriasis in palms and soles present in four ways – chronic plaque psoriasis, hyperkeratotic eczema type, palmoplantar pustulosis and psoriatic keratoderma.

Lichenplanus(LP)isabenign,pruritic,idiopathicinflammatorydisorderwhichcan affect the skin, nail, mucous membrane and hair. If it affectspalms and soles, it is known as palmoplantar lichen planus(PPLP)

Pitted keratolysis is alsoknownaskeratolysisplantaresulcatum. Itisabacterialinfectioncausedbycorynebacterium, micrococcus(kytococcus sendentarius), dermatophilus congolensis, actinomyces. Under prolonged hyperhidrosis, occlusion and contact with the wet surface, the bacteria proliferatesand release proteinasethat destroysthe stratum corneum. Sulphur compounds such as thiols and thiol esters were responsible for the malodour.

Syphilis is a sexually transmitted infection caused by Treponema pallidum. The clinical course of syphilis is divided into four stages. They are primary, secondary, latentandtertiarysyphilis.Chancrecharacterizestheprimarystage.Cutaneouslesions of secondary syphilis are polymorphic. They are macular,papular, follicular, lichenoid, psoriasiform, corymbiform, frambesiform, pustular and pigmentary.

Theword‘intertrigo’comesfromthelatinwordinter-betweenandterere-torub.
Therewillbepoorcirculationofairbetweenwebspaces,sowaterretainedinthe web spacesoverhydrate the epidermis, which easily macerate on trivial trauma or repeated friction.

Wart is an infectious disease caused by Human papilloma virus. The morphological variants of warts are common wart, plane wart, filiform wart, palmoplantar wart, anogenital wart, pigmented wart.

Hand foot mouth disease - Acute infection caused by coxsackievirus A16, A6 and enterovirus 71. Children less than10yearsare mostoften affected. Incubationperiod variesfrom3-6days. Initially patient has prodromal symptoms which is followed by enanthem over the tongue and buccal mucosa. The disease is self-resolving and management is supportive.

Dermatophytosisisaninfectiousdiseaseofskin,hairandnailcausedbyagroupof filamentous fungi known as dermatophytes. Thetermtineapedisisusedfordermatophyteinfectionofthefeet. Tinea manuum refers to dermatophyteinfection of hands, caused by T.rubrum, T.mentagrophyte & E.flocossum. Tinea manuum usually affects the dominant hand but it can also occur bilaterally. Other variants like vesiculobullous, pustular and papular types are also seen. Dermatophytosisisdifferentiatedfromeczemabyconcurrentinvolvementof nails(T.unguium).

Corn is a circumscribed, cone shaped, hyperkeratosis of the skin. The size of this conical mass varies from 1mm to 2 cm. Apex of the corn presses the underlying structureandproduceseverepain.Onthesurfaceofthecorndermatoglyphicsarelost.

Callus is a circumscribed hyperkeratosis of the skin with preserved skin markings and commonly occursat the site of contact withpressure/ friction.

Palmoplantar keratodermaisaheterogenousgroupofdisordercharacterizedbyexcessivethickeningof palms and soles. Itisdividedintoinheritedor acquired. PPKisclassifiedclinicallyasdiffuse,focal,striateorpunctateanddevelopseitherin isolation or in association with other cutaneous and extracutaneous manifestations.

Hyperhidrosis - Excesssweatsecretioniscontrolledbyanegativefeedbackfromsweatglandto hypothalamus. Dysfunctioninthispathwaymayleadtohyperhidrosis. Palmoplantar hyperhidrosis may be continuous or phasic. When continuous, it is not relatedtoemotionalstress.Butphasichyperhidrosisclearlyassociateswithemotional stress.

Trophiculceris alsoknownasmalperforansorneuropathiculcerorneurogeniculcer. Causes for neurogenic ulcers are Hansen’sdisease, Diabeticneuropathy, Alcoholicpolyneuropathy, Syringomyelia, Spina bifida and Pressure ulcer in paraplegics.

Erythema multiforme(EMF)is an acute, self-limited, cell mediatedhypersensitive reaction to infections and drugs. Herpes simplex infection is the most common cause for EM. Apart from herpes simplex many bacterial, viral, fungal infections, various drugs, malignancies and autoimmune disorders, may act as a trigger for EM.

Triple palm is yellowish, velvety thickening withincreased rugosity and dermatoglyphic pattern present over the palm. It is one of the paraneoplastic manifestations. Triple palmalone isseen in lung cancer, tripe palm with acanthosis nigricans is associated with gastric cancer.

Porokeratosis plantaris palmaris et disseminata,starts in the adolescence. It is characterized by smallpainful or pruritickeratotic papules thatappearsinitially over palms and soles, and laterbecomesgeneralized. Classical PPPD lesions are annular than punctuate.[3]

Punctuate porokeratosis usually startsin the 2nd to 3rddecade of life. Lesionsappear as spinykeratotic papule or punctuate lesionsconfined topalms and soles with accentuation over thecreases. Absence of involvement of other parts of the body is the characteristic feature.[4]

Dyshydrosiform bullous pemphigoid is a localized clinical variant of bullous pemphigoid, characterized by vesiculobullous lesion over palms and soles.In majority of patients, the lesions are confined to palms and soles, but in few cases it may progressto generalized form.

Acral lentigenous melanoma is the commonest type of melanoma seen in black skinned individuals. It commonly presentsover the ventral aspect of palms, soles and subungual region. The lesionstartsas a brown to black macule,with radial outgrowth over months or years,followed by dermal invasion. Due to delay in diagnosis,ALM has a poor prognosis.

Materials And Methods:-

A total of 100 patients who presented to Department of Dermatology, Venereology and Leprosy, Basaweshwara teaching and general hospital, attached to Mahadevappa Rampure Medical College, Kalaburagi during the period of 1st March 2021 to 31st August 2022 were included in this study. Demographic details such as age, sex, occupation were recorded in all the participants. A detailed history regarding duration of illness, previous treatment, similar illness in the family and any relevant co morbidities were also recorded. General and dermatological examination were done for all. Palms and soles were examined in detail. For scaly lesions wet mount and 10% potassium hydroxide mount were done and for pustular lesions gram stain was done. Skin biopsy was taken for some cases.

Results:-

Outofthe100patientsincludedinourstudy,63weremalesand37 were females. The male to female ratio was 1.7:1.

The maximumnumber ofpatientsin bothsexeswere inthe economically most active age group of 17-40 years (55%), second highest was observed in the age group of 41-60 yearsand least number of patients were in theage group of 6-10 years.

Prurituswasthecommonestsymptomobservedin50%ofpatients,followedbypain in 40%.59%of patients withpalmoplantar dermatoses had no seasonal variationof symptoms. Winter exacerbation of symptoms was noted in 21% of patients.

Both palmar and plantar involvement were seen in 42% of patients. Palmar region was involved in 38% of patients and soles alone were affectedin 20% of cases. Inthepalmardermatoses,fingersweremostcommonlyaffectedfollowedby thenarregion.Leastcommonlyaffectedsitewas dorsal extension. Intheplantarregion,metatarsalareawasmostfrequentlyaffected;followed by insole and heal.

Majorityofpatientswithpalmoplantardermatosesweremanuallabourers(42%), followed by house wives in 22% of cases.

Eczemawasthemostcommonpalmoplantardermatosesseenin20%ofpatients, followed by psoriasis in 16% and fungal infections in 12%.

Discusssion:-

Totally 100 patients were enrolled in our study, out of these majority of patients (63%) were males. A similar male preponderance was also observed by P.A.Nair et al and kang et al.[5]

55% of patients were in most economically active age group (17-40 years). Two other studies also reported similar findings.[5,6]

In our study, pruritus (50%) was the prominent symptom in palmoplantar dermatoses, comparable to a study conducted by P.A.Nair et al.[5] Second common symptom was pain(40%) in our study, but P.A. Nair et al observed peeling of skin.[5]

Seasonal variation of diseases affecting palms and soles was reported in 41% of patients in our study, which was higher than in the study conducted by P.A.Nair et al(29.7%).[5]

Involvement of both palms and soles(42%) was the commonest pattern of palmoplantar dermatoses in our study. Palms and soles were equally affected in two other studies.[5,6] According to our study, the most common part affected in the palmal surface of hand was fingers(52%). P.A. Nair et al also made similar observation in their study.[5] In the sole, metatarsal area(31%) was commonly involved in our study, in contrast to heel in P.A.Nair et al.[5]

Majority of patients in our study were manual labourers(42%). A similar observation was also reported by chopra et al and kodali et al, whereas P.A.Nair et al and A.A.Hongel et al observed palmoplantar dermatoses, predominantly in house wives.[5,6]

The three most common palmoplantar dermatoses in our study were eczema(20%), followed by psoriasis(16%) and fungal infections(12%). In contrast to our observation, A.A.Hongel et al reported psoriasis, fungal infections and focal hyperhidrosis were the three most commonest palmoplantar dermatoses.[6]

Individual Palmoplantar Dermatoses

Eczema:

The male to female ratio in our study was 2.3:1, comparable to study conducted by S.Handa et al.Most men were manual labourers and female were house wives.In our study, Pompholyx(15%) and hyperkeratotic eczema(15%) were the most commonest specific morphological types, similar to a study by S. Handa et al. 25% morphological patterns of hand eczema did not fit into any specific types. According to our study, atopy was one of the most important risk factor associated with hand eczema and it was reported in 40% of patients. JP.Thyssen et al. and S.Handa et al also observed the same in their study.History of barefoot walking was present in 70% of patients.

Psoriasis:

Male preponderance(56.25%) was noted in our study, which was similar to the study done by Khandpur et al, A.A. Hongal et al and P.A.Nair et al.[5,6] But study from Kumar et al and Chopra et al reported almost equal involvement in men and women. Similar to Kumar et al study, in our observation also majority of male patients were manual workers and female patients were house wives.Seasonal variation was reported in 81.3% of the patients in our study.Involvement of both palm and sole(87.5%) was the commonest presentation in our study, P.A.Nair et al[5], Khandpur et al and A.A.Hongel et al[6] also observed similar findings in their study. In a Study by Kumar et al reported plantar involvement was twice common compared to palmar involvement.Hyperkeratotic type(56.3%) of palmoplantar psoriasis was commonly reported in our study, but Kang et al reported palmoplantar pustulosis as the commonest type.According to our study, in the palmar region pressure areas such as thenar, hypothenar(43.8%) and fingers(37.5%) were more commonly affected and in the sole, non-pressure bearing insole(43.8%) area was more frequently involved . Khandpur et al, Kumar et al and A.A.Hongal et al[6] also observed similar findings in their study.

Fungal Infection:

Commonest fungal infection observed in our study was candidal intertrigo (75%) followed by dermatophytosis(25%)**.** Majority of the patients of candida intertrigo were females(55.5%) and most of them were house wives (55.6%). Similar observations were also made by A.A. Hongel et al.[6]

Palmoplantar Wart:

Our study reported male preponderance and majority of lesions in economically active age group (17-40 years).Palmar warts (70%) were more common than plantar warts. All the observations were comparable to the study of Ghadgepatil et al.[7]

Focal(Palmoplantar) Hyperhyderosis:

Similar to study from Park et al, preponderance of males(57%) in palmoplantar hyperhidrosis was noted in our study. This was in contrast to the study done by Srutton et al, where female preponderance was observed. In contrast to this Lear et al[8] in their study reported female preponderance and Strutton et al reported equal sexual affection. Majority of affected population in our study were students(42.9%) and executives(28.6%), which is comparable to the study by Park et al and Lear et al.[8]In our study, majority of patients (71.4%) had family history of palmoplantar hyperhidrosis, similar to observations made by Km et al.Palmar hyperhidrosis(57.1%) alone was the commonest pattern observed in our study, but park et al reported combined palmoplantar involvement as the commonest pattern.

Pitted Keratolysis:

In our study, all patients affected were males(100%).Pruritis(75%) was the commonest symptom reported.Soles alone was involved in half(50%) of the patients.Majority of lesions were seen over the weight bearing areas and more than half of patients had hyperhiderosis(75%). All the findings were similar to the study by Naik et al.

Hand Foot Mouth Disease:
In our study, slight male preponderance was seen, comparable to study conducted by Ang et al and Qiu et al.[9] Majority of patients were less than 5 years of age, similar to observation made by Quin et al.All the patients were asymptomatic and had bilateral involvement of palms and soles.

Palmoplantar Keratoderma:
In our study, majority of patients affected were males(60%%) which is comparable to study conducted by Mahajan et al.Similar to study conducted by Chopra et al, majority of patients were manual labourers. Silimar findings were seen in a study conducted by Mahajan et al.Pain and seasonal variation was present in all patients.Both palms and soles were involved in all patients.

Trophic Ulcer Of Leprosy:
Similar to study conducted by Subramoniam et al, metatarsal area(66.7%) was the most commonest site for leprosy ulcer in the sole.[10]Second commonest site for leprosy ulcer in our study was great toe, similar to subramoniam et al observation.In our study, 14.7% had bilateral involvement of sole which is almost similar to the study by subramoniam et al (20%).[10]

Callosity:
In our study, most commonly affected were elderly population i.e., 41-60 years (75%) which is comparable to study conducted by Dunn et al and Spink et al.Females were most affected which was even observed in study conducted by Gorter et al.Similar to studies conducted by Menz et al and Spink et al, metatarsal area was commonly involved in our study.

Lichen Planus:
In our study, male (75%) preponderance was seen.Plantar (50%) involvement was slightly more common than palmar (25%) involvement. Most common morphological type observed was hyperkeratotic type(75%).Most prominent symptom was itching (100%). All the patients had skin or mucosal lichen planus lesions elsewhere in the body.All the observations were comparable to the study by Sinha et al.[11]

Corn:
In our study, female preponderance was seen.Majority of patients were females(66.6%).All patients presented with pain.

Secondary Syphilis:
Similar to study of Udaya kumar et al, preponderance of secondary syphilis in males(100%) and manual labourers(50%) were observed in our study also.[12]

Erythema Multiforme:
In our study, female preponderance(66.6%) was seen.All patients were young adults(age group 17-40 years).The above findings were comparable with studies conducted by Huff JC et al and Sokumbi O et al.Palmar involvement alone was seen in all the cases.Majority of patients had no symptoms. Similar finding was seen in study conducted by William PM et al.

Chronic Cutaneous Lupus Erythematosus:
One case of erosive localized chronic cutaneous lupus erythematosus was seen which involved thenar eminence of palms in our study.

Epidermal Nevus:
In our study, one case of epidermal nevus was seen with unilateral involvement over sole.

Picture:- Various palmoplantar dermatoses.

Clinical pictures of various palmoplantar dermatoses. A-Candidal intertrigo, B-Palmar eczema, C-Plantar psoriasis, D-Hand foot mouth disease, E-Plantar wart, F-Palmar keratoderma. G-Trophic ulcer of leprosy.

Conclusion:-

Palmoplantar dermatoses is a heterogeneous group of disorders and have versatile manifestations. There is no standard classification available to group these disorders. Most of the studies in the palmoplantar dermatoses were focused on the specific diseases. There are very few comprehensive studies affecting palms and soles, available in the medical literature. This study highlights the need for comprehensive studies with large population in palmoplantar dermatoses.

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