CLINICAL AND HISTOPATHOLOGICAL STUDY OF CUTANEOUS TUBERCULOSIS

DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE UNIVERSITY REGULATIONS FOR

DOCTOR OF MEDICINE IN

DERMATOLOGY, VENEREOLOGY AND LEPROSY

(BRANCH – XIIA)

APRIL 2013

THE TAMILNADU

DR.MGR MEDICAL UNIVERSITY,

CHENNAI, TAMIL NADU.

CERTIFICATE

This is to certify that this dissertation entitled **"CLINICAL AND HISTOPATHOLOGICAL STUDY OF CUTANEOUS TUBERCULOSIS"** is a bonafide record work done by **Dr.MANJUNATHA P** under supervision and guidance, submitted to the Tamil Nadu Dr.M.G.R Medical University, Chennai for partial fulfillment of the requirement for the award of M.D. [DERMATOLOGY, VENEREOLOGY AND LEPROSY].

Dr.A.S.Krishnaram. M.D.,D.D.,
Professor & Head
Department of Dermatology,
Madurai Medical College &
Government Rajaji Hospital
Madurai.

Dr. D. Amal Raja. M.D.,D.V.,
Professor & Head
Department of STD
Madurai Medical College &
Government Rajaji Hospital
Madurai.

DECLARATION

I, **Dr. MANJUNATHA P,** solemnly declare that dissertation titled **"CLINICAL AND HISTOPATHOLOGICAL STUDY OF CUTANEOUS TUBERCULOSIS"** carried out by me at Department of Dermatology, Government Rajaji Hospital during the period of Oct 2010 – Sept 2012.

I also declared that this bonafide work was not submitted by me or any other for any award, degree, diploma to any other university board either in India or abroad.

This dissertation is submitted to The Tamilnadu Dr. M.G.R Medical University, Chennai in partial fulfillment of the rules and regulation for the **M.D., [DVL]** Degree examination to be held in April 2013.

Place: Madurai **Dr. MANJUNATHA P.**
Date:

ACKNOWLEDGEMENT

My sincere thanks to the **DEAN Prof. Dr. N. MOHAN, M.S, F.I.C.S F.A.I.S, F.M.M.C**, Madurai medical college & Government Rajaji Hospital, Madurai for permitting me to do the dissertation and allowing me to make use of hospital materials for the study.

I would like acknowledge my thanks and sincere gratitude to **Dr.A.S.Krishnaram M.D., D.D.,** Professor & Head, Department of Dermatology, Madurai Medical College & Government Rajaji Hospital, Madurai who has been a source of inspiration and motivation, for his immense guidance and help throughout the study and also during my postgraduate course.

I am very grateful to **Prof. Dr.G. Geetharani, M.D., DNB** for her motivation and valuable guidance throughout the study and also during my postgraduate course and I express my sincere thanks to **Prof. Dr.A. K.P.Vijayakumar M.D., D.D.,** for his guidance and encouragement throughout the study and also during my postgraduate course.

I would like acknowledge my sincere thanks to **Dr. Amal raja M.D., D.V.,** Professor and HOD, department of STD, for his valuable guidance and support. I would like to express my heartful thanks to Assistant Professors, **Dr. R.Kothandaraman, Dr. P.Sathesh, Dr. Balaji Adityan, Dr. Suganya** for their valuable advice during the study. I would like to express my sincere thanks to

Dr. M.S. Adityan, Dr. M. Senthil kumar, Dr. A. Ayyam perumal, Assistant professors, department of STD, for their constant guidance and support during the study.

I thank my co-postgraduates, for helping me during tough times.

I thank all those patients who participated in the study, without whom this study would have been only a dream.

TABLE OF CONTENTS

INTRODUCTION

Tuberculosis of the skin is caused by mycobacterium tuberculosis, mycobacterium bovis. The inflammatory reactions of the host define the disease.

Tuberculosis (TB) has been part of human history since prehistoric times. Nowadays there has been increasing incidence of cutaneous tuberculosis all over the world in the HIV/AIDS epidemic due to arise of resistant strains of mycobacterium tuberculosis and also due to factors like poverty, immunosuppression, and malnutrition.

Tuberculosis of skin has varied clinical manifestations, importance and course of the disease just like systemic tuberculosis. The pathogenicity of bacilli, entry of infection, immunity of the individual and specially acquired immunodeficiency syndrome (AIDS) , condition of the skin all these influence the clinical presentation of skin tuberculosis.

Diagnosis is based on clinical manifestations, histopathological analysis demonstration of mycobacterium in tissue or in culture and host reaction to Mycobacterium tuberculosis antigen. Treatment is with multi drug regimens, cases of multidrug resistant tuberculosis or extensively multidrug tuberculosis require special attention. Course and prognosis depend on the individual's immunity. Treatment is curative except for patients with breakdown of the immune system.

REVIEW OF LITERATURE

HISTORY

Tuberculosis (TB) has been part of the human beings from the ancient times. The detection of mycobacterium TB in the remains of bison 17000 years ago was the supposed to be the earliest evidence. But TB first found in bovine and later transferred to humans or it is derived from a common ancestor is not clear now.[1]A comparison between mycobacterium TB complex (MTBC) genes and MTBC genes of animals tells that humans did not acquire infection from animals during animal domestication as accepted before. Both bacterial strains have a common ancestor that could have caused the infection in humans early in the Neolithic revolution.[2] Researchers have found tuberculous decay in spine of Egyptian mummies recovered from 3000 – 2400 BC and remains of bones also showed tuberculosis in prehistoric humans.[3]

Phthisis an old word used for pulmonary TB, phthisis is a Greek word means consumption.[4]

Hippocrates found phthisis as the most extensive disease of the times and it was said to cause fever and coughing of blood that was fatal always.[5]

Tuberculosis was there in America since 100 AD according to genetic studies.

According to Folklore, before industrial revolution that TB was often associated with vampires. When one person of a family died due to it, the other affected persons health deteriorates slowly. People thought that it was due to original person with TB draining life from other family individuals.[6]

Dr Richard Morton in 1689, established tubercles as a pathology associated with pulmonary tuberculosis.[7,8] Due to its varied symptoms TB was not found as a single disease until 1820s and was not termed Tuberculosis until in 1839 by J.L. schonlein.[9]

Scrofuloderma and lupus vulgaris, the oldest types of skin TB in medical literature were known previously as the king's evil.

Lupus meaning wolf like earlier was said to any ulcerative lesion, reminiscent of bite of a wolf. The word lupus was used clinically by Robert willand for depicting the facial skin TB in 1803. This clinical term of facial lupus gave rise to introduction of new terminology like lupus erythematosus and lupus pernio.

The word tuberculosis verrucosa cutis was coined in the year 1869. Kaposi was the first to described the involvement of skin and mucous membranes by tuberculosis.

Darier in 1896 found out the concept of tuberculid. Later pautrier described the papulonecrotic tuebrculid.

EPIDEMIOLOGY

Skin TB constitutes only one percent of all cases of TB, even though high prevalence of TB seen in developing nations.

Skin TB is seen all over the world with increased prevalence in temperate regions. Ways of spread include through aerosols, coitus, skin and mucous membrane inoculum. Dogs, cattle, cats, monkeys and microbial cultures can act as infective sources. Iatrogenic spread seen in laboratory personnel. Childhood, elderly, poor socioeconomic status, crowding, immigration, poor hygiene and diet contributing factors in the spread and incidence of the disease.[10]

According to Bhutto AM et al, lupus vulgaris is the most prevalent in adults while scrofuloderma more in children indicating that children are more susceptible than adults.[11]

Pandhi et al [12] found that children were affected with cutaneous tuberculosis more commonly, with scrofuloderma was the most common type followed by lupus vulgaris and other types while few patients had systemic tuberculosis also.

Kumar et al [13] found that in his study males were frequently affected more than females, tuberculosis verrucosa cutis was the common type in contrast to most indian studies. Most common age group affected was 16 – 25 years.

BACTERIOLOGY

Dimensions of Mycobacterium tuberculosis are 2.5 – 3.5micrometer in length and 0.3 – 0.6 micrometer in breadth. It is a gram +ve non sporing acid, alkali and alcohol fast bacillus with rich lipid content. Tuberculoprotein constitutes the vital antigenic structure in peptidoglycan envelope of the bacterium which is employed for mantoux test. TB bacilli take 21 -28 days to show growth in Lowenstein – Jensen cultures medium while for confirmation it takes six to seven weeks in inoculation in guineapigs.[14]

IMMUNOLOGY OF CUTANEOUS TUBERCULOSIS

Five to ten percent of patients develop disease actively following infection. Cell mediated immunity with sensitized Th1 lymphocytes plays a critical role in controlling the infection.[15] The interaction of antigen-presenting cells with antigen-specific T and B lymphocytes with subsequent production and release of the cytokines, interleukins 2 and 12 (IL2, IL12), interferon gamma (IFN-gamma), tumour necrosis factor alpha (TNF-alpha) is an intricate process with many facets still unaccounted for.[16] Typically there is formation of tubercle with epithelioid cells along with Langhans' giant cells in varying proportions and caseation because of destruction of epithelioid cells. Immunology of cutaneous tuberculosis is poorly understood. It is thought that the clinical variants of skin TB form an immunological spectrum with lupus vulgaris at one pole with good immunity and scrofuloderma at the other pole with poor immunity. Warty tuberculosis shows intermediate changes indicating a balanced immune response between Th1 and Th2 cytokines.[17]

CLASSIFICATION

Classification of cutaneous tuberculosis is based mainly on aetiology, immunity status of the individual and morphology of the lesion, Even though the classification is not clinically useful.

CLASSIFICATION OF CUTANEOUS TUBERCULOSIS[18]

	Route	Disease	Immunity
I.	Inoculation tuberculosis (Exogenous)	a) Lupus vulgaris	present
		b) Warty tuberculosis	present
		c) Primary inoculation tuberculosis	Absent
II.	secondary tuberculosis (Endogenous)	a) Tuberculosis cutis colliquativa	equivocal
		b) Tuberculosis cutis orificalis	absent
III.	Tuberculids	Papulonecrotic tuberculid Lichen scrofulosorum Erythema induratum	

Primary tuberculosis (TB chancre, cutaneous primary complex)[19]:

Seen in individuals with absent immunity as shown by primary tuberculin test.

It occurs following entry of TB bacilli into skin or mucosa of the host with absent immunity via abrasions usually on limbs and face specially in young kids, following circumcision, ear piercing, artificial respiration, syringes, injuriy, surgeries[19] (This is believed to be an uncommon form of skin tuberculosis)[11] but the incidence may be underestimated, particularly in areas with a high prevalence of TB and tattooing, insects, coitus.[19,20] M. Bovis as recently been reported as the causative organism of a tuberculous chancre in a patient with HIV infection.

Clinically,

Following 21 – 28 days after inoculation, a tiny inflammatory popular lesionarises that soon burst into firm granulomatous ulcer with no sign of healing for many weeks. With time, crusting and margins became firmer. Apple jelly nodules may be seen on diascopy in small lesion if there is is no antecedent trauma.

Usually seen over the face, hands and lower limbs.[19] Healing may obscure the underlying active infection and a cold abscess may form. Regional lymphadenopathy often develops after 4 to 8 weeks. The ulceroglandular complex

is the cardinal feature of primary inoculation TB of the skin which as we see in primary lung Ghon complex. Sometimes lesions masquerading as paronychia have been reported over the fingers. Ulceration and edema of the conjunctiva and eyelids along with preauricular infection of lymph nodes has been reported

Histopathology -

Acute neutrophilic infiltrate with plenty of TB bacilli along with ulceration and necrosis, following three to six weeks, granulomatous infiltrate with epithelioid cells, Langhans' type giant cells and collarette of lymphocytes can be seen with caseation necrosis forms with consequent decrease in the bacilli count as the immunity often develops. Features in the lymph nodes are same.[21]

If untreated, the chancre will take many months to heal slowly. Lupus vulgaris may develop at the site of the original lesion.[19] Occasionally, haematogenous spread of the organism can occur with development of tuberculosis elsewhere, including miliary tuberculosis[22]. Erythema nodosum seen in 4 out of forty patients in one study.[19] More commonly there is resolution of enlarged lymph modes by calcification and less commonly cold abscess and sinuses may form. Untreated the condition may last upto 12 months.[18] Regional lymph nodes can soften and may form scrofuloderma. Acute military TB may occur with poor prognosis in individuals with low immune status and high bacilli count. Its more often with

moderate host immunity strong tuberculin reactivity seen. However sometime late in the course latent infective foci may reactivate and bacillary dissemination to distant areas. Like this lupus vulgaris and TB verrucosa cutis can occur as late consequence of primary inoculation TB.[21]

Scrofuloderma : (Tuberculosis colliquativa cutis)

Scrofuloderma occurs due to affection and opening of the skin over the underlying TB focus, it could be lymph node, bone, joint, lacrimal gland or duct[19] or tubercular epididymitis.[18]

This can be multibacillary or paucibacillary TB of the subcutis which forms cold abscess and later breakdown of the overlying cutis. It rarely develops by entry of exogenous TB bacilli into subcutaneous plane by injury or by injections in patients with past latent or manifest TB. In one series [23] and also in another study [19] scrofuloderma developed more often in neck following cervical lymph node infection and in axilla, groin, epitrochlear and posterior auricular region uncommonly and only in 2 individuals following infection of tibia and fibula. Scrofuloderma was the most frequent type in Indian children[12,20,22] & in adults in UK.[19] Prevalence is higher among children, adolescents and the aged.[18]

Clinical features -

Scrofuloderma usually seen over the cervical and preauricular areas and can be bilateral at times. Initially starts as painless mobile nodule which becomes attached to skin and softens as it increases in size and following liquefaction in few monthstime ulceration and sinuses result with undermined margins with bluish hue and granulomatous base.[24] resembles fungating masses if granulation is exuberant. Cribriform scar forms once healing has occurred at site of affection. Sweet's syndrome was found to be associated with scrofuloderma. [25]

Multiple lesions may occur following hematogenous dissemination affecting the trunk and pubic regions and in gluteal region with multiple discharging sinuses and abscesses simulate hidradenitis suppurativa. Over a period of few weeks nodes become large, breakdown to form ulceration and fistulation. It may take years for it to become spontaneously heal. Keloidal scarring and recurrences are seen. Tuberculin sensitivity is marked. Cribriform scars clinches the diagnosis even though the disease has become silent.[18]

Histopathology -

Usually epidermis is atrophic or ulcerated, an underlying abscess and caseation necrosis in the dermis and subcutis may be present. Granulomas at the periphery of necrotic tissue will be present. Few lymphocytes in dermis. Acid fast bacilli (AFB) can be usually seen in the sections. Bacterial culture is confirmatory.

Scrofuloderma more often associated with visceral TB and commonly lungs. Lupus vulgaris can arise at the scar of scofuloderma. Epithelioma can occur and infrequently systemic amyloidosis described in one patient with scrofuloderma.

Orificial tuberculosis:

Also known as tuberculosis cutis orificialis occurs due to autoinoculation of tubercle bacilli in individuals with advanced visceral TB specially with pulmonary, intestinal or anogenital disease through which increased number of bacilli enter the mucous membranes of orifices. Most frequently seen in middle-aged or elderly males than females with advanced visceral TB. Following at the site of trauma shed bacilli from these sites will get inoculated into mucocutaneous orifices.

Clinical features - A small yellowish nodule appears on the mucosa and breaks down to form a soft ulcer with typical punched out appearance, undermined edges and circular or irregular border. The ulcer floor often exhibits multiple yellowish

tubercles often bleed easily. The surrounding mucosa is edematous and inflamed. Lesions may be single or multiple and are extremely painful resulting dysphagia.[18]

Ulcerative lesions occur most commonly in tongue in cases where mouth is affected and anal area in intestinal TB and vulva, penis in genitourinary TB. Ulcers that exhibit no tendency to heal portends grave prognosis.

Other site reported to be involved include salivary gland and lymph node.

PCR (polymerase chain reaction) can help in the diagnosis.[26]

Histopathology -

There will be ulceration and and edema with massive inflammatory infiltrate in the dermis with caseating granulomas and plenty of acid fast bacilli.

Disseminated miliary TB of the skin :

Very uncommon form of cutaneous TB seen more often in childhood occurs due to hematogenous dissemination usually from internal foci like pulmonary or meningeal usually in the background of decreased host immunity eg, measles or in AIDS.[27]

Clinically, the lesions can be seen anywhere in the body with most commonly involving trunk, gluteal and genital regions and also mouth in a host who is typically ill with negative tuberculin test. Profuse crops of papules, vesicles,

pustules, nodules[28] or hemorrhagic lesions with vesicles can form small ulceration.[29] Heavy bacterial load seen in the lesions.

Histopathology - Early lesions there is focal necrosis and abscess formation, with numerous acid-fast bacilli, surrounded by a zone of non-specific chronic inflammation. In older lesions granulomas usually develop in this outer zone. In the pustular lesions seen in patients with AIDS, there are numerous neutrophils in the papillary dermis, with rare Langhans' giant cells.[30]

The occurrence of rash in an ill patient with active TB indicates the diagnosis and can be confirmed with biopsy. ATT should be started with strong suspicion although the prognosis is poor for the patient due to overwhelming infections. Sometimes spontaneous resolution when internal clinical features did not fatal.

Tuberculous gumma : (Metastatic tuberculous abscess)

A rare type of cutaneous TB usually seen in children, which occurs due to hematogenous spread from the primary focus of infection during the time of bacillemia and in patients with decreased immunity. Tuberculin reactivity is moderate.

Clinically,

The solitary or multiple, cold, subcutaneous nodules that become non tender abscesses and breakdown the skin resulting in ulcers and sinuses and sometimes

isolated abscesses in subcutis through hematogenous spread in patients with HIV/AIDS.[31] Ulcerated gummas can be seen young adults over the extremities.

Histologically,

Findings include that of tuberculous granulation tissue with abscess and necrosis can be seen and tubercle bacilli can be demonstrable from the pus.

Bacterial culture is confirmatory for the diagnosis.

Tuberculosis verrucosa cutis : (warty TB, prosector's wart, verruca necrogenica, postprimary inoculation tuberculosis and verrucous TB)

It is warty plaque results due to entry of bacilli into the skin of individuals with moderate to high immune status. It can also be seen in the skin of previously infected or BCG immunized individual. It can occur as accidental infection in persons such as physicians, pathologists, and post mortem workers and it can occur by autoinoculation of sputum in patients with active TB. Lastly children can acquire infection who walk barefoot and by sitting on playground where TB bacilli present. It is the most prevalent type in Hong kong in 1960s.[19]

There are few organisms in the lesion (paucibacillary).

Clinically ,

Initially the lesion starts as a papule or papulopustule which enlarges peripherally with inflammatory halo forms and verrucousity appears quickly. Slowly there is irregular centrifugal polycyclic serpiginous or annular warty plaque along with

sponataneous central resolution and eventual central atrophy develops. Pus can be exuded through the fissures in warty portions. The lesions seen more frequently in acral areas (Europe) which are prone for trauma and to infected sputum and can also be seen in gluteal region.(Asia)

Atypical clinical patterns reported include perianal ulcerations, sclerotic masses, fungating granulomas, multifocal guttate TB verrucosa cutis, destructive papillomatous type, an exuberant granulomatous form, tumor like, Papulonecrotic and lupoid lesions found associated with a generalised pattern. Lesions can simulate lupus vulgaris, may be keloidal or psoriasifrom. Very rarely, sporotrichoid spread and also tuberculous lymphadenitis can occur.[19,21]

Histologically,

More often there will be hyperkeratosis and hyperplasia with pseudoepitheliomatous proportions with abscess formation. Caseating granulomas with epithelioid cells and giant cells and acid fast bacilli can be usually found in mid-dermis. Typical tubercles are less common and sometimes infiltrate can be nonspecific.[18,30]

TB verrucosa cutis shows a good response to ATT and without ATT, it may remain quiescent for many months to years and remission may occur spontaneously with the resulting atrophic scars. Overall the condition has favourable outcome.

Lupus vulgaris :

It is a chronic progressive paucibacillary type of cutaneous tuberculosis seen in previously sensitized patients with low to moderate immunity showing strong mantoux reactivity seen more commonly in women than men. Most common type in adults in India, south Africa and Pakistan.[11,22]

The most common type of cutaneous tuberculosis in India, South africa and Pakistan, Tunisia is lupus vulgaris[11,22]

It arises by an underlying focus in bone, joint, lymphnode and as extension from the contiguous spread of the disease from underlying structure involved by blood or lymphatic spread, following exogenous inoculation, or following BCG vaccination.[32]

Lupus vulgaris is typically a paucibacillary type of skin TB, which usually makes successful culture difficult. In one series, bacilli were cultured from only 6% of nearly 4000 patients. Culture and and mycobacterium DNA detection by PCR useful in the diagnosis where bacilli are scanty. Culture and PCR can be employed for the diagnosis.

Clinically, arises as single lesion on the normal skin, tattoo area, site of BCG vaccination, scar of scrofuloderma most commonly seen over the head (nose) and neck region (80%) followed by lower and upper extremities, face is involved less

commonly in India while gluteal and trunk regions involved commonly. It starts as small soft flat plaque lesion with apple jelly nodules on diascopy are diagnostic. The lesion slowly gets elevated, infiltrated and expands in a gyrate pattern with atrophic areas, usually a solitary lesion but multiple lesions in disseminated type that is usually seen with associated pulmonary TB.[19,21]

Varying clinical patterns of lupus vulgaris[19] are,

a) Flat plaques with gyrate edge with psoriasiform scales covering the surface, larger plaques may display areas of scarring with islands of active lupus tissue with hyperkeratotic and thickened edge.
b) Ulcerative and mutilating pattern where it involves the deeper tissues and cartilage structures with predominantly scarring and ulceration and causing deformity and contractures.
c) Vegetating type where it involves the mucous membranes and cartilage which are destroyed by ulceration and necrosis, marked infiltration and ensuing in disfigurement and scar formation.
d) Tumor like form where it commonly involves ear lobes which becomes greatly increased in size due to epithelial hyperplasia with formation of hyperkeratotic masses and soft tumor forms, the myxomatous form involves earlobes.

e) Papular and nodular forms which is usually seen following temporary immune suppression (measles) where multiple lesions seen occurring simultaneously in disseminated lupus (miliary lupus)

Mucosal involvement -

Where the involvement is primarily in the form of papule, nodule or ulcer or by contiguous extension with commonly affecting nasal, buccal or conjuctival mucosa that bleed easily later leading to destruction. Dry rhinitis can be an early feature. Direct involvement of buccal mucosa, palate, gingiva or oropharynx through lymphatic spread or by direct extension which later producing scarring and deformity.

Other reported variants of lupus vulgaris seen are ;

a) Lupus vulgaris verrucosus due to pseudoepitheliomatous hyperplasia.
b) Lupus vulgaris ulcerosus occurs when massive necrosis within the tuberculous granulomas, accompanied by destruction of tissues and cartilage
c) Lupus vegetans seen in regions of erosive and ulcerative disease
d) Lupus vulgaris postexanthematous in patients with waning immunity (after measles)

Mantoux reactivity will be usually positive . Bacilli in the lesions are sparse and ginea pigs often get affected with disseminated TB at expected time following inoculation. PCR detection of mycobacterial DNA found to be promising in facilitating the diagnosis of lupus vulgaris and also other types of cutaneous TB.[68]

Internal focus of infection can be traced by imaging techniques like ultrasonography and magnetic resonance imaging.

Histologically,

Epidermis may be atrophic or hyperplastic rarely pseudoepitheliomatous hyperplasia. Near confluent tuberculoid granulomas with variable lymphocytes in upper and mid dermis along with moderate number of Langhans' type of giant cells. Caseation sometimes can be seen. Bacilli are difficult to demonstrate in the sections as they are scanty in number.[30]

Inspite of its indolent course, it can lead to progressive scarring, destruction and contractures. The thin unstable scars may become keloidal or may breakdown or active lupus vulgaris can reappear in the scar frequently. Squamous cell carcinoma, basal cell carcinoma or sarcoma can arise in 8% of caes.

Tuberculids :

It was first explained by Darier in 1896. It is characterised by positive mantoux reactivity with history of past TB or manifest TB and a favourable response to to ATT and bacilli will be absent in tissue sections. It was thought tuberculids are due

to hypersensitive reaction to tubercle bacilli or its constituents in patients with strong immunity.[19]

CLASSIFICATION[18]

Terminology	Relationship to TB	Entities
Tuberculids	Conditions where mycobacterium tuberculosis appear to play a significant role	Lichen scrofulosorum Papulonecrotic tuberculid
Facultative tuberculids	Conditions where mycobacterium tuberculosis/bovis may be one of pathogenic factors	Erythema induratum of Bazin, Erythema nodosum
Non - tuberculids	There is no relationship to tuberculosis	Lupus miliaris disseminatus faciei, Rosacea – like tuberculid, Lichenoid tuberculid

Pathogenesis - It is incompletely understood. Tuberculids are believed to be as a result of haematogenous dissemination of bacilli in a patient who has moderate to high immunity against tubercle bacilli although it is not usually possible to find out the bacilli as they may be in fragmented form or destroyed by immune

mechanisms. However mycobacterial DNA are detected significantly in papular and nodular forms of tuberculid.[18,19]

Lichen scrofulosorum :

It is a lichenoid papular eruption seen more often in childhood and adolescent age group with tuberculosis with strong mantoux reactivity first described by Hebra in 1868.

A common tuberculid in the past now rarely encountered in Europe among immigrants and in north india with age group less than 15 years and 72% had evidence of TB focus in the body like lung, lymph node, bone, brain. This tuberculid also been reported to be caused by mycobacterium szulgai, avium and following BCG vaccination.

It was thought to result from an immune response to hematogenous spread from an underlying tuberculosis focus. It has been observed to occur after the start of ATT and may suggest a shift in cell mediated immunity of the host.

Clinical features - lesions are usually confined to the trunk most often occur in children and adolescents with active tuberculosis. The lesions are asymptomatic, firm, follicular or perifollicular flat topped yellowish or pink papules, sometimes with fine scale. Lichenoid grouping is pronounced and lesions may coalesce to form rough, discoid plaques. Lesions persists for months but spontaneous involution eventually occurs.[18]

Histopathology - Lichen scrofulosorum is characterized by non-caseating tuberculoid granulomas, lymphocytes and occasional giant cells in the upper dermis, the lesions have a perifollicular and eccrine localization. Bacilli are not demonstrable. PCR is not able to detect mycobacterial DNA so far.[19,30]

With ATT, lesions disappear with residual scars in 4 to 8 weeks.

Papulonecrotic tuberculid - Symmetric eruption of necrotizing papules appearing in crops, predominantly involving the extensor extremities with individual lesions heal with varioliform scar. The lesions are considered by some to represent the paucibacillary form of haematogenous disseminated tuberculosis.

It has been found to be associated with tuberculosis (38 – 75%) in many studies, occurred following BCG vaccination suggesting probable hematogenous spread of tubercle bacilli as a causation of the tuberculid, in one series, papulonecrotic tuberculids transformed into lupus vulgaris, one case caused due to mycobacterium avium complex in HIV infected patient.

It shows strong tuberculin sensitivity within 8 - 12hrs.[18,19]

Clinical features -

Symmetrical eruption of recurrent crops of red papules which ulcerate, crust leaving behind atrophic varioliform scars in a matter of few weeks, some cases rapidly healing lesions while a chronic open ulcer may remain for months together.

With new crops of lesions occur throughout the months or years. Commonly seen in young adults and in children with phlyctenular conjunctivitis may be present. Sites of involvement include extensor aspects, acral areas while ears, face gluteal region sometimes alone may be involved.[18,19]

Histopathology - Papulonecrotic tuberculid exhibits ulceration and V-shaped areas of necrosis, which include a variable thickness of dermis and the overlying epidermis. There is a surrounding palisade of histiocytes and chronic inflammatory cells, and an occasional well-formed granuloma. Vessels in the vicinity show disruption and fibrinoid necrosis of their walls, sometimes with accompanying thrombosis or vasculitis. Follicular necrosis or suppuration is present in approximately 20% of cases. No bacilli can be demonstrated using routine staining methods.[30]

Lesions showed prompt response to anti tubercular therapy whether or not a tuberculous focus is identified.[18] Full specific anti tubercular therapy should be given.[19]

Erythema induratum : (Bazin's disease, nodose tuberculid)

It is chronic disease characterised by inflammatory cutaneous and subcutaneous nodules with a tendency for ulceration and scarring most commonly occurs in women distributed over the posterior aspect of legs and thought to be due to hypersensitivity reaction to tubercle bacilli.

Researchers[33] supported the connection between TB and erythema induratum in patients with personal and family history of TB, with strong tuberculin sensitivity, complete disappearance of the lesions after ATT.

The pathogenesis of erythema induratum and papulonecrotic tuberculid are same with hematogenous spread of bacilli or dissemination of tubercular antigen into a cool extremity with altered circulation. PCR detection of mycobacterial DNA thus indicating molecular confirmation for supporting the association of erythema nodosum and TB.[1]

Clinically,

There will be symmetrical eruption of few tender well circumscribed nodules which typically involves the posterior aspect of the legs, rarely pretibial area of young and adult females. The lesions usually show regression within few months specially in summer while some may evolve into painless irregular and shallow ulceration with crusting which is precipitated by cold weather. The ulcers may

remain for months and resolution is slow in spite of adequate treatment[5] if associated erythrocyanotic features present.

Histologically ,

There can be focal or diffuse, lobular or septolobular, granulomatous panniculitis along with neutrophilic vasculitis of small or large blood vessels. More often there are poorly formed granulomas even though with mixed palisading and lipophilic granulomas can occur with areas of coagulative and caseation necrosis.

Erythema induratum was differentiated from nodular vasculitis by significant necrosis of fat lobules and extension of tuberculoid granulomas into lower dermis.[30]

In early stage, vessel wall inflammation with thickening of vessel wall with variable perivascular infiltrate, a septal panniculitis is seen that may enter into fat lobules. In some patients tuberculoid infiltrate can be seen throughout. Fat necrosis and foreign body giant cell reaction can be seen. A lobular granulomatous pattern in affected fatty tissue may cause atrophy where normal fat disappears andoccupied by fibroblasts and macrophages.[6] Caseation and liquefaction may be seen in old lesions and later fibrosis results. Caseation is a late feature and can be observed in 50% patients.[7]

Patients show strong mantoux reactivity sometimes with ulceration.

Bacterial cultures were negative.

Erythema nodosum can show a periodic change with on and off lesions with the lesions getting worsened during winter season and getting better with summer season. Overall a favourable outcome can be expected if no general disease is identified although vigilant investigations may reveal in large number of patients with active TB in an organ or an evidence of past TB.

Antitubercular treatment for six months is most vital in the treatment of erythema nodosum.

Erythema nodosum -

Erythema nodosum is a panniculitis which results in painful nodules involving the legs and less frequently the thigh and forearm occurs as reaction to infcetions and drugs predominantly seen in women. Associated constitutional symptoms are common.

Histological evidence suggest that it is an immune reaction as a result of deposition of immune complexes in the dermal blood vessels is a significant factor in producing the symptoms.[8]

In a study by carlos et al,[9] 34% of cases of erythema nodosum were due to infective causes like group A beta haemolytic streptococcus (7%), tuberculosis (5%). Non streptococcal throat infections (13%) and sarcoidosis contributed (22%). The other etiological factors were sweet's disease, behcet's disease.

In one study in Singapore, 60% cases of erythema nodosum were idiopathic, 26% were due to viral and streptococcal throat infections, 3% were tuberculosis and 4%were pregnancy. While sarcoidosis and inflammatory bowel disease were less common.[34]

Erythema nodosum can be presenting sign of tuberculosis. It occurs more often in association with primary TB , occurs in 3 – 8 weeks of infection at the time when mantoux reactivity becomes positive. It is a hypersensitivity reaction as bacilli could not be found in the lesions and a high circulating levels of immune complexes was assigned to the response.[35,36,37]

Davies and ormerod reported 2 cases of erythema nodosum and tuberculosis[37]

Where a 16 year old female who hailed from UK had an history of travel to hong kong 2 years back. She was symptomless with the exception of erythema nodosum over both the legs for two years, chest x ray displayed minimal lung shadows near left hilum. Mantoux reactivity was strongly positive.

Bronchial washings were positive for AFB on smear and bronchoscopy did not show any abnormal findings. Following ATT, there was clearing of the erythema nodosum and disappearance of lung shadows.

Poncet reported one condition known as tuberculous rheumatism in which he described one case with erythema nodosum and bilateral ankle pain. The arthralgia could be due to immune reaction to tuberculoprotein. Poncets disease also termed

as tuberculous rheumatism where synovial fluid culture and histology were positive for TB. It is diagnosed if other aetiology of polyarthritis were ruled out.

Poncets disease can be a differential expression of a single immune pathogenic response to tuberculin.[35,38]

If suspecting a diagnosis of erythema nodosum, it is customary to see underlying condition if any, which include a thorough history, drug intake (oral contraceptives), vigilant physical examination and chest radiograph.

Pulmonary tuberculosis can present as erythema nodosum. The erythema nodosum from tuberculosis settles down quickly once the ATT started but analgesics or a non-steroidal anti-inflammatory agent may have to be used to make the patient symptom free and corticosteroids are needed rarely.[37]

Other Rare Forms of Cutaneous Tuberculosis :

Tuberculosis fungosa serpiginosa -

It is a very rare type of cutaneous TB which is usually seen in anergic elderly patients occurs due to endogenous or exogenous inoculation presents with thick papillomatous, vegetative plaques seen involving axilla or dorsa of hands which simulate a chronic vegetative pyoderma. The lesions are fissured and fistulae with exudates have high bacilli content. Mantoux reactivity is not seen. Serpiginous and annular lesions form by peripheral spread and central healing.[21]

Iatrogenic immunization tuberculosis -

It is a tuberculosis infection varying from tuberculous chancre to tuberculosis colliquativa cutis, tuberculosis cutis luposa , or miliary TB of skin may also occur following BCG vaccination.[39,40] As BCG immunization the organism is an attenuated mycobacterium tuberculosis, bovis, it may act as a virulent opportunistic pathogen in conditions with low or absent immunity. Since an increase in the AIDS all over the world, the incidence of such iatrogenic form is increasing.

Tuberculous mastitis -

It is a rare type of cutaneous tuberculosis which involves the breast that leads to nontender cold abscess, can be diagnosed based on microbiological investigations and histological features. There are four types - nodular type, the most common type presents as breast lump sometimes with sinuses, acute miliary type, disseminated type, sclerosisng type, tuberculosis mastitis obliterans due to ductal infection.

Demonstration of bacilli is difficult. Granuloma finding in FNAC (fine needle aspiration) warrants empirical ATT.[41]

BCG vaccination - It appears to protect against infants and children from the more severe form of tuberculosis but its ability to prevent the disease in adults remains uncertain. In a normal course of BCG vaccination an infiltrated papule develops after two weeks and attains a size of approximately 10mm by 6 to12 weeks , then ulcerates and heals with scar. Vaccination may provoke an accelerated reaction in a previously infected person. The regional lymph nodes expand often healing without opening up. Mantoux reactivity usually develops 5 – 6 weeks following vaccination. Complications caused by BCG vaccination is difficult to assess.[18] Lupus vulgaris can arise at the site of vaccination commonly within a few months following vaccination although cases have been described as late as 3 years following immunization.[42,43] This can be a recurrent problem[44] and is more likely to occur after multiple vaccinations.[45] Scrofuloderma has also been reported.[46] Several of the tuberculids including lichen scrofulosorum[47] an atypical papular tuberculid thought to be a variant of papulonecrotic tuberculid[48] Koch phenomenon (a tuberculin reaction that occurs when a culture of tubercle bacilli is injected into the skin of subjects already infected with the disease, a positive tuberculin reaction indicates sensitization resulting from a tuberculosis infection), regional adenitis sometimes severe and with systemic symptoms more often in children, after deep injection local abscesses, excessive ulceration.

Diagnosis of skin TB usually needs demonstration of tubercle bacilli in the smear , in histological sections or its isolation in vitro. Many authors have made efforts but could not able to demonstrate in the tissue sections of the common types of skin TB by acid fast stain. Fluorescent staining technique found to be more effective even though still not very useful in lupus vulgaris. The absolute confirmation of the diagnosis can be made by isolating the bacilli.[21]

Absolute criteria include,

Culture, guinea pig inoculation and a positive PCR for mycobacterium tuberculosis DNA.

Relative criteria include,

A comaparative history and cutaneous examination, active systemic TB, positive mantoux reaction, positive ELISA for antibody to PPD purified protein derivative of tuberculin reaction or mycobacterium tuberculosis antigen6, compatible histological features, tubercle bacilli (AFB) in the lesion, fluorescent technique demonstration of tubercle bacilli, response to ATT.

The novel technique for making quick diagnosis of tuberculosis is PCR which is found to be a promising tool for identifying mycobacterium TB specific DNA and yields many copies of TB specific nucleic acid sequence. PCR is highly sensitive and specific which is due to a putative insertion sequence IS6110 which is found in 6 – 15 copies in most strains of mycobacterium TB. Other primer probe sequences

used are ribosomal ribonucleic acid, the DNA sequence mtp40, DNA encoding on 38 kd or 65 kd and MPB64.26

As PCR can be done on formalin fixed and paraffin embedded tissue sections, it is a promising tool for extra pulmonary TB, especially for the skin TB.

PCR found to be effective not only in tissue sections of cases like lupus vulgaris,[49] scrofuloderma[50] and many other forms of skin TB,[1] but also in tuberculid reactions which are truly tubercular in origin.[51]

PCR requires a few days for establishing the diagnosis as compared to culture and inoculation where they take weeks' time for the diagnosis.

PCR allows for a rapid diagnosis and hence the treatment of underlying systemic TB foci.[52]

Treatment -

At present, ant tubercular treatment is by directly observed treatment short course (DOTS) strategy, it is being executed by world health organization (WHO). This programme is run by Indian government in the form of revised national tuberculosis control programme (RNTCP).

As cutaneous TB comes under extra pulmonary tuberculosis, category one ATT is indicated as per DOTS.

It includes isoniazid (H) 600 mg, rifampicin (R) 450 mg, pyrazinamide (Z)1500mg, ethambutol (E) 1200mg in category one. It is given for naïve patients

with sputum smear positive, naïve sputum smear negative and naïve extra pulmonary tuberculosis.

Regimen include $2H_3R_3Z_3E_3 + 4H_3R_3$, intensive phase given for 2 months and 4 months for continuation phase. Four drugs at thrice in a week schedule for 2 months (intensive phase) and two drugs thrice in a week for 4 months (continuation phase). According to body weight, doses are modified in paediatric age group.

Therapeutic trial of ATT has been tried for the cases of cutaneous TB when the diagnosis is in doubt. It has been found that 5 weeks appear to be an adequate time for therapeutic response in skin TB except for tuberculids and patients with minimal clinical activity prior to ATT and patients in whom response is not seen by this time unlikely to respond further and their diagnosis need to be reviewed.[53]

Therapeutic trial of ATT has been tried for proving or disproving the diagnosis of cutaneous tuberculosis and it has been found that 6 weeks of therapy is sufficient to make a diagnosis or to disprove the diagnosis.[54]

AIM OF THE STUDY

To study the Clinical and Histopathological features of Cutaneous Tuberculosis.

MATERIALS AND METHODS

All the patients attending skin OPD, government rajaji hospital were analysed during a study period between October 2010 to September 2012.

Patients with skin lesions suggestive of cutaneous tuberculosis were included in the study. A detailed clinical history and a thorough physical examination including BCG scar and lymphadenopathy of each case was done and noted.

Investigative profile include,

Complete blood count, renal function test, HIV ELISA, blood VDRL.

Discharge from the lesion and from tissue, smears were made and screened for bacilli by fluorescent technique. First the smears were air dried and heat fixed and stained with auramine O stain (0.1%) for 20 minutes, then washed and flooded with 5% acid alcohol for 3 minutes, then washed with potassium permanganate for one minute and then washed and then visualised under fluorescent microscopy.

Biopsy was done for all the cases using by punch biopsy technique and was formalin preserved and later paraffin embedded and 5-6 micron sections were made and H&E (haematoxylin and eosin) staining was performed. Special staining for AFB bacilli was also done using fite's stain. All the slides were examined using light microscope under scanner view (4x), low power view (10x) and high power view (40x).Various histological findings were recorded.

Mantoux test was done using purified protein derivative (PPD) 0.1 ml, 5 tuberculin units injected over the volar aspect of the forearm by tuberculin syringe and induration was measured 72 hrs later in all the cases.

Chest x-ray, sputum for AFB, chest physician opinion to rule out pulmonary tuberculosis.

Patients were classified after clinical and histological confirmation accordingly. Later the patients were given category one ant tubercular treatment and therapeutic response was assessed and followed up monthly.

OBSERVATIONS AND RESULTS

Out of 106368 patients attending skin OPD, government rajaji hospital Madurai, patients with cutaneous tuberculosis constitute 35 during a study period between October 2010 to September 2012.

Incidence of cutaneous tuberculosis was 0.33 per 1000

FIGURE 1: PREVALENCE OF DIFFERENT TYPES OF CUTANEOUS TUBERCULOSIS

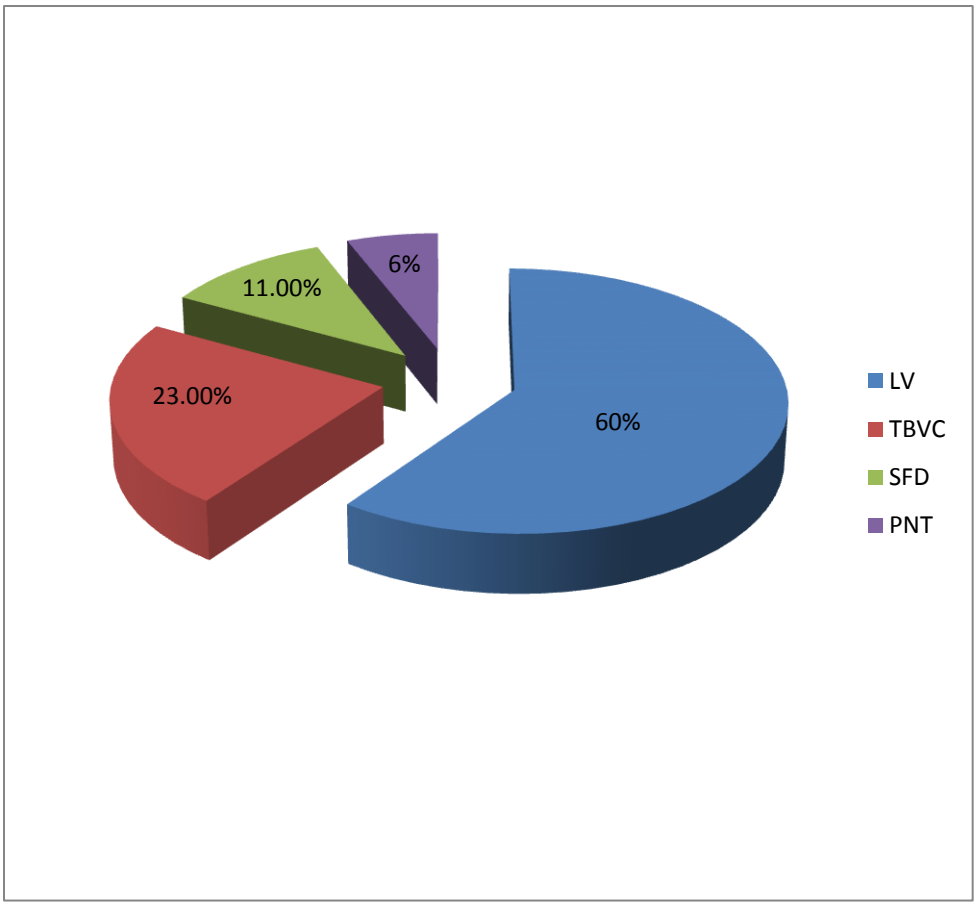


TABLE 1

SL NO.	CLINICAL TYPE	NUMBER OF CASES	PERCENTAGE
1	LUPUS VULGARIS (LV)	21	60%
2	TUBERCULOSIS VERRUCOSA CUTIS (TBVC)	8	23%
3	SCROFULODERMA (SFD)	4	11%
4	PAPULONECROTIC TUBERCULID (PNT)	2	6%
	TOTAL	35	100%

Prevalence of different types of cutaneous tuberculosis were ; Lupus vulgaris 21 cases (60%), Tuberculosis verrucosa cutis 8 cases (23%), Scrofuloderma 4 cases (11%) and Papulonecrotic tuberculid 2 cases (6%). (Table 1 and Figure 1)

AGE AND SEX WISE DISTRIBUTION

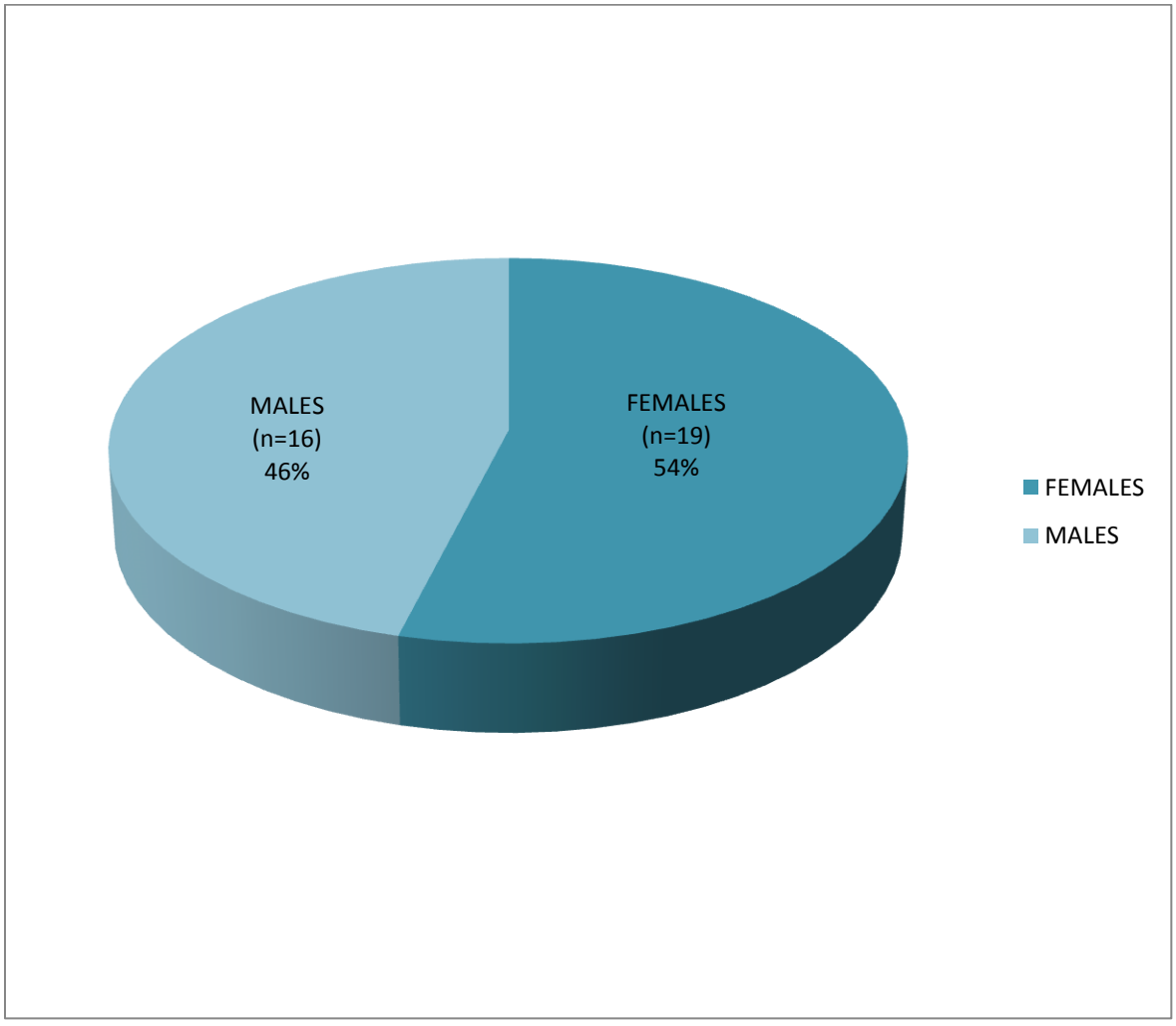
TABLE 2

Age in years	Males	Females	Total
0-9	-	-	-
10-19	7	3	10
20-29	7	13	20
30-39	2	1	3
40-49	-	1	1
50-59	-	-	-
60-69	-	1	1

Incidence was more in females - 19 cases (54%),Incidence in was males - 16 cases (46%), Incidence was high in the age group between 20 to 35yrs - 23cases (66%), Youngest person affected was 12 yrs. female, Oldest person affected was 62 yrs. female. (Table 2)

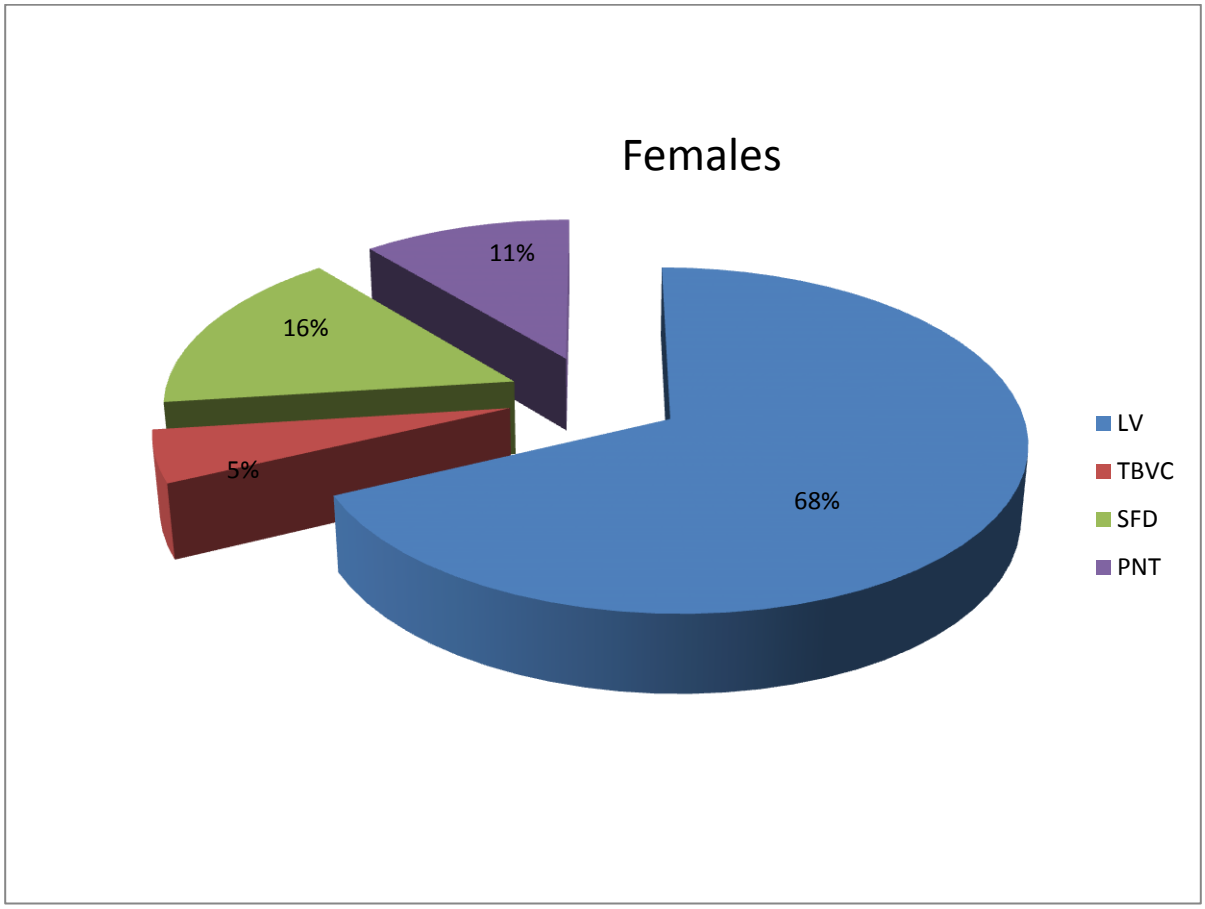
SEX WISE DISTRIBUTION OF CUTANEOUS TUBERCULOSIS

FIGURE 2: SEX RATIO



Prevalence among females is 54% (n=19), Prevalence among males is 46% (n=16) and Male to Female Sex Ratio was 1:1.2 (Figure 2)

FIGURE 3: FREQUENCY OF DISTRIBUTION OF DIFFERENT CLINICAL TYPES OF CUTANEOUS TUBERCULOSIS IN FEMALES

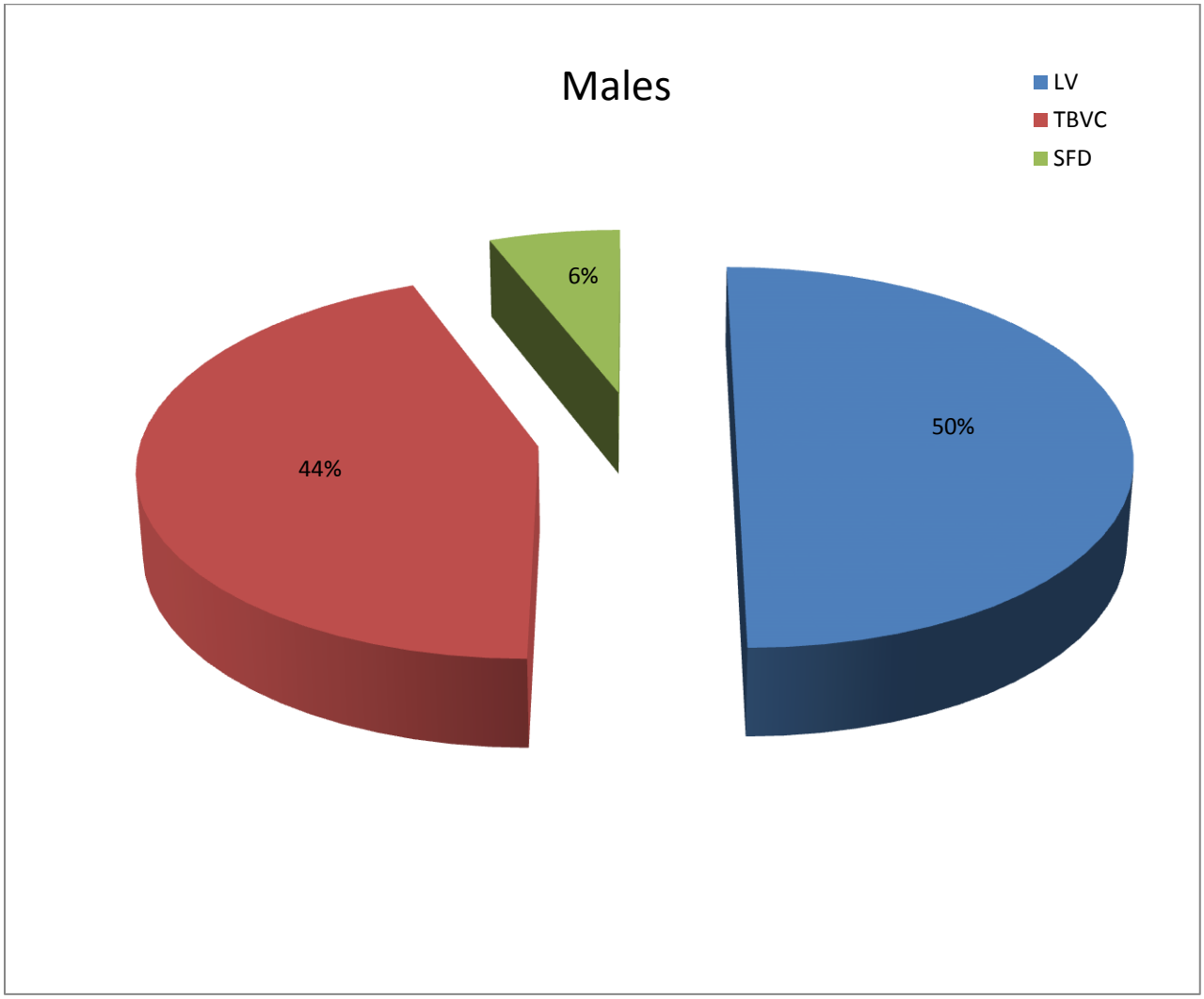


Out of 35 cases, 19 were females.

Out of 19 cases the incidence of each type of cutaneous tuberculosis were, Incidence of lupus vulgaris was 68% (13 cases),Incidence of tuberculosis verrucosa cutis was 5% (1case), Incidence of scrofuloderma was 16% (3 cases) and Incidence of papulonecrotic tuberculid was 11% (2 cases).

(figure 3)

FIGURE 4: FREQUENCY OF DISTRIBUTION OF DIFFERENT CLINICAL TYPES OF CUTANEOUS TUBERCULOSIS IN MALES



Out of 35 cases, 16 were males.

Out of 16 cases, the incidence of each type cutaneous tuberculosis were,

Incidence of Lupus vulgaris was 50% (8 cases), Incidence of Tuberculosis verrucosa cutis was 44% (7 cases), Incidence of Scrofuloderma was 6% (1 case) (Figure 4)

FIGURE 5: SEX WISE DISTRIBUTION

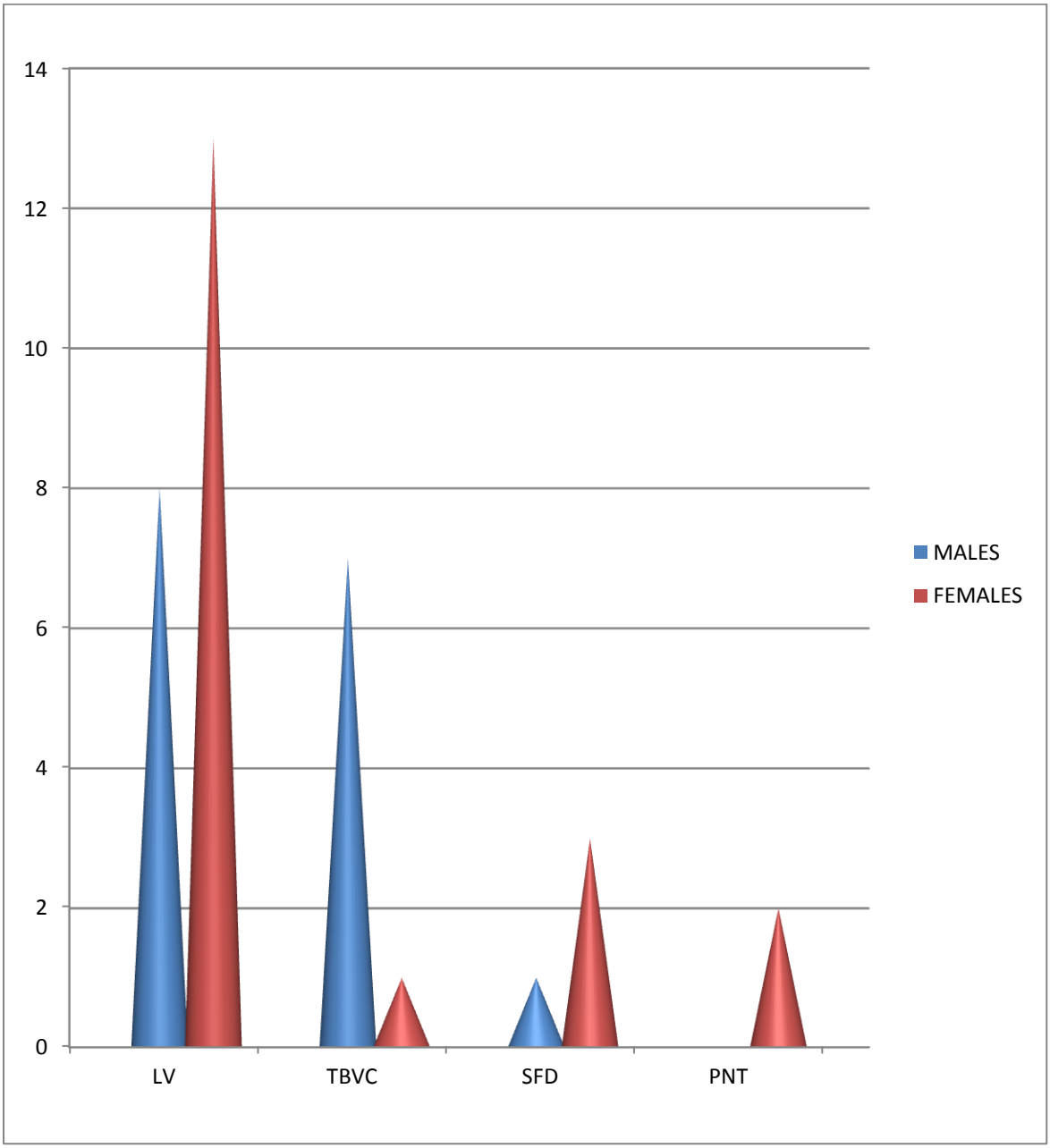


TABLE 3

CLINICAL TYPE	MALES		FEMALES	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
LUPUS VULGARIS	8	50%	13	68%
TBVC	7	44%	1	5%
SCROFULODERMA	1	6%	3	16%
PAPULONECROTIC TUBERCULID	0	-	2	11%

Incidence of lupus vulgaris was more in females 68% (n=13) as compared to males where the incidence was 50% (n=8), Incidence of tuberculosis verrucosa cutis was more in males 44%(n=7) when compared to females where the incidence was 5% (n=1), Incidence of scrofuloderma more in females 16%(n=3) as compared to males where the incidence was 6% (n=1). (Table 3, Figure 5)

FIGURE 6: AVEARGE DISEASE DURATION OF DIFFERENT TYPES OF CUTANEOUS TUBERCULOSIS

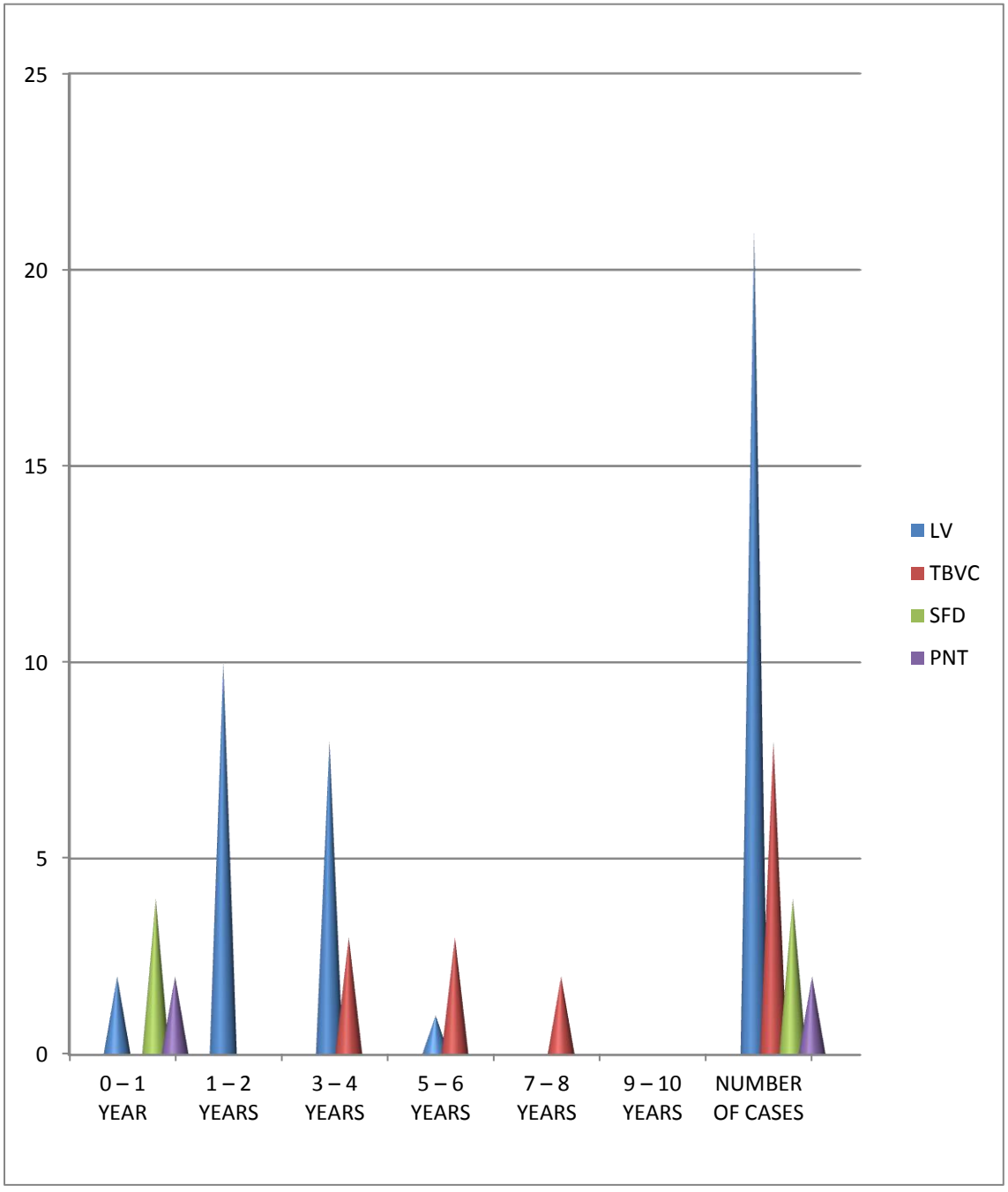


TABLE 4

DURATION OF ILLNESS	LUPUS VULGARIS	TUBERCULOSIS VERRUCOSA CUTIS	SCROFULODERMA	PAPULONECROTIC TUBERCULID
< 1 YEAR	2	-	4	2
1 – 2 YEARS	10	-		
3 – 4 YEARS	8	3		
5 – 6 YEARS	1	3		
7 – 8 YEARS	-	2		
9 – 10 YEARS	-	-		
NUMBER OF CASES	21	8	4	2

Average duration of lupus vulgaris was 1year, Average duration of tuberculosis verrucosa cutis was 3 years, Average duration of scrofuloderma, papulonecrotic tuberculid was less than one year. (Table 4, Figure 6)

SYMPTOMATOLOGY IN EACH TYPE OF CUTANEOUS TUBERCULOSIS

TABLE 5

SYMPTOMS	NUMBER OF CASES (n) AND PERCENTAGE (%)			
	LUPUS VULGARIS	TUBERCULOSIS VERRUCOSA CUTIS	SCROFULODERMA	PAPULONECROTIC TUBERCULID
PRURITUS	(n=14) 66%	(n=6) 75%	-	(n=2) 100%
PAIN	(n=1) 5%	(n=4) 50%	-	(n=2) 100%
DISCHARGE	(n=1) 5%	-	(n=4) 100%	-
BLEEDING FROM THE LESION	(n=1) 5%	-		-
PROGRESSIVE LESION	(n=8) 38%	(n=3) 37%	(n=4) 100%	-
STATIC LESION	(n=16) 76%	(n=4) 50%	-	
NEW LESIONS	-	-	-	(n=2) 100%
RESPIRATORY SYMPTOMS	-	-	-	-
HISTORY OF TRAUMA	-	-	-	-
FAMILY HISTORY OF TB AND ATT	(n=1) 5%	(n=1) 12%	-	-
PAST HISTORY OF TB AND ATT	-	-	-	-

Out of 35 cases, 94% (n=29) presented as solitary lesion, of which 63% (n=21) were lupus vulgaris, 23% (n=8) were tuberculosis verrucosa cutis and 11% (n=4) were scrofuloderma, Multiple lesions seen in 6% (n=2) of papulonecrotic tuberculids cases. Pruritus was the major symptom present in (n=6) 75% of Tuberculosis verrucosa cutis cases, (n=14) 66% of lupus vulgaris cases, 6% (n=2) of papulonecrotic tuberculids cases. There was no past history of trauma prior to the onset of the lesion. Discharge was present in 100% (n=4) of scrofuloderma cases. Family history of pulmonary tuberculosis in each case of lupus vulgaris and tuberculosis verrucosa cutis. There was no family history of cutaneous tuberculosis. (Table 5)

General physical examination was found to be normal in all the patients and BCG scar was noted in all the patients. Systemic examination was found to be normal in all the cases.

DERMATOLOGICAL FINDINGS

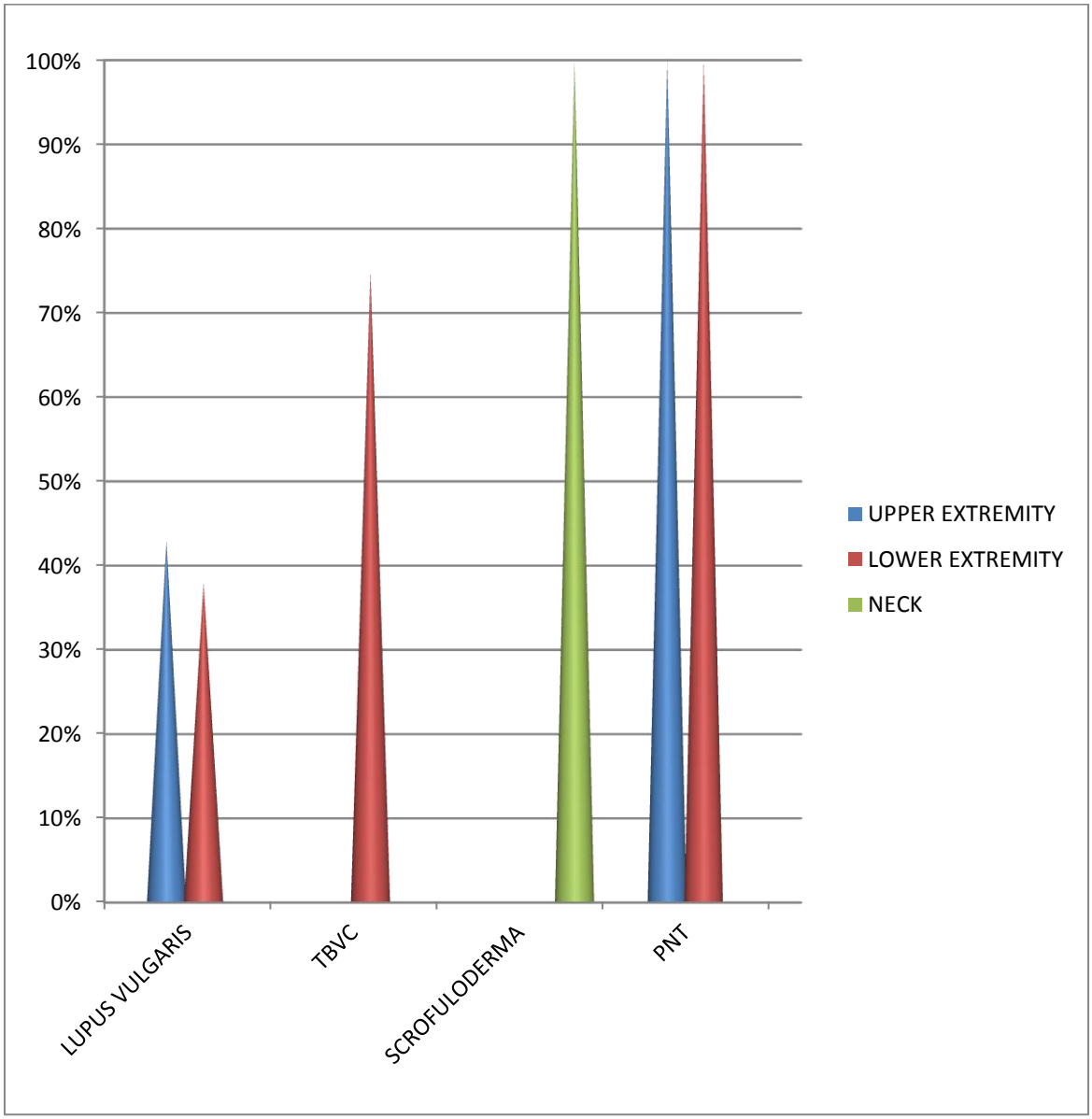
TABLE 6

CLINICAL TYPE	SOLITARY LESION	MULTIPLE LESION	NUMBER OF PATIENTS
LUPUS VULGARIS	21	-	21
TUBERCULOSIS VERRUCOSA CUTIS	8	-	8
SCROFULODERMA	4	-	4
PAPULONECROTIC TUBERCULID	-	2	2

Among 35 cases,

All 21 cases of Lupus vulgaris presented as solitary lesion. All 8 cases of Tuberculosis verrucosa cutis presented as solitary lesion. All 4 cases Scrofuloderma presented as solitary lesion while multiple lesions were seen in both cases of papulonecrotic tuberculid. (Table 6)

FIGURE 7: SITE OF DISTRIBUTION OF DIFFERENT TYPES OF CUTANEOUS TUBERCULOSIS



SITE WISE DISTRIBUTION OF CUTANEOUS TUBERCULOSIS

TABLE 7

CLINICAL TYPE	FACE	NECK	AXILLA	FOREARM	ELBOW	HAND
LUPUS VULGARIS	1	0	1	5	3	1
TBVC	0	0	0	0	0	2
SCROFULODERMA	0	4	0	0	0	0
PNT	0	0	0	2	2	0

TABLE 8

CLINICAL TYPE	GLUTEAL	THIGH	KNEE	LEGS	FOOT	OTHER SITE
LUPUS VULGARIS	0	0	4	0	4	2
TBVC	1	0	0	0	4	0
SCROFULODERMA	0	0	0	0	0	0
PNT	0	2	0	2	2	2

Lupus vulgaris was commonly seen over the upper extremity in 43% cases (n=9) and lower extremity in 38% cases (n=8), Tuberculosis verrucosa cutis was commonly seen in lower extremity in 75% cases (n=6), Neck was the most common site involved in Scrofuloderma 100% cases (n=4), Both cases of Papulonecrotic tuberculid (PNT) was seen symmetrically distributed over the upper and lower extremities. (Table 7 & 8, Figure 7)

MORPHOLOGY OF EACH TYPE OF CUTANEOUS TUBERCULOSIS

LUPUS VULGARIS

TABLE 9

MORPHOLOGY OF LUPUS VULGARIS	**NUMBER OF CASES (n) PERCENTAGE (%)**
VERRUCOUS PLAQUE	(n=6) 29%
PSORIASIFORM PLAQUE	(n=7) 33%
GYRATE PLAQUE WITH ATROPHIC AREA	(n=8) 38%
FIRM CONSISTENCY	(n=13) 62%
SOFT TO FIRM CONSISTENCY	(n=8) 38%
TENDERNESS	(n=1) 5%
PSORIASIFORM SCALE	(n=7) 33%
DISCHARGE	(n=1) 5%
CRUST	(n=1) 5%
BLEEDING	(n=1) 5%
REGIONAL LYMPHADENOPATHY	-
GENERALISED LYMPHADENOPATHY	(n=1) 5%
TOTAL NUMBER OF CASES OF LUPUS VULGARIS	21

Among 21 cases of Lupus vulgaris,

Typical gyrate plaque with atrophic area was seen 38% (n=8) of cases, Psoriasiform plaque was seen in 33% of cases (n=7), Verrucous plaque was seen in 29% of cases (n=6), Varying sizes from 3-4 cms to 7-8cms, Firm 62% cases (n=13) and soft to firm consistency 38% cases (n=8), Lymphadenopathy was seen in one case 5% (n=1), Rare case of Lupus vulgaris in the breast simulated elastosis perforans serpiginosa and one case of Lupus vulgaris in the earlobe which lead to tear of the earlobe. (Table 9)

TUBERCULOSIS VERRUCOSA CUTIS
TABLE 10

MORPHOLOGY OF TUBERCULOSIS VERRUCOSA CUTIS	**NUMBER OF CASES (n) PERCENTAGE(%)**
VERRUCOUS PLAQUE	(n=8) 100%
FIRM CONSISTENCY	(n=3) 37%
AREAS OF SOFTENING IN THE PLAQUE	(n=5) 62%
TENDERNESS	(n=4) 50%
PUS DISCHARGING POINTS	(n=5) 62%
CRUSTING	(n=5) 62%
REGIONAL LYMPHADENOPATHY	(n=1) 12%
GENERALISED LYMPHADENOPATHY	-
TOTAL NUMBER OF CASES OF TUBERCULOSIS VERRUCOSA CUTIS	8

Among 8 cases of Tuberculosis verucosa cutis,

Most common morphological features observed include, Well defined verrucous plaque in all 100% cases (n=8), Varying sizes ranging from 8-6 cms to 4-3cms, Firm consistency in 37% cases (n=3), Areas of softening in the plaque in 62% cases (n=5), Tenderness in 50% cases (n=4), Pus discharging points in the plaque present in 62% cases (n=5), Crusting seen in 62% cases (n=5), Lymphadenopathy in one case (12%). (Table 10)

SCROFULODERMA

TABLE 11

MORPHOLOGY		**NUMBER OF CASES (n) PERCENTAGE**
ULCER	IRREGULAR SHAPE	(n=4) 100%
	SHAGGY MARGIN	(n=4) 100%
	DISCHARGE	(n=4) 100%
	GRANULATION	(n=4) 100%
	CRUST	(n=4) 100%
	TENDERNESS	(n=2) 50%
UNDERLYING STRUCTURE	LYMPH NODE	(n=4) 100%
	BONE	
	JOINT	
TOTAL NUMBER OF CASES OF SCROFULODERMA		4

Among 4 cases of scrofuloderma, the presentation was, Irregular shaped ulcer of varied sizes with shaggy margins, Discharge and crusting was present in all the cases (100%), Tenderness was present in 2 cases (50%), Underlying structure was lymph node in all the cases (100%), most commonly cervical lymph node (Table 11).

In both cases of Papulonecrotic tuberculid, Symmetrical distribution of numerous erythematous circumscribed nonfollicular papules with central necrosis with scales and crust in some of the lesions, Varioliform scars were present along with the primary lesions, One case was associated with generalised lymphadenopathy.

INVESTIGATIONS

ROUTINE BLOOD INVESTIGATIONS

TABLE 12

INVESTIGATION	LUPUS VULGARIS	TUBERCULOIS VERRUCOSA CUTIS	SCROFULODERMA	PAPULONECROTIC TUBERCULID
COMPLETE BLOOD COUNT	NORMAL	NORMAL	NORMAL	NORMAL
INCREASED ESR	21	8	4	2
RENAL FUNCTION TEST	NORMAL	NORMAL	NORMAL	NORMAL
LIVER FUNCTION TEST	NORMAL	NORMAL	NORMAL	NORMAL
HIV ELISA	NEGATIVE	POSITIVE	POSITIVE	NEGATIVE
BLOODVDRL	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE
TOTAL NUMBER OF CASES	21	8	4	2

MANTOUX TEST REACTIVITY IN EACH TYPE OF CUTANEOUS TUBERCULOSIS

TABLE 13

MANTOUX READING	LUPUS VULGARIS	TUBERCULOSISVERRUCOSA CUTIS	SCROFULODERMA	PAPULONECROTIC TUBERCULID
INDURATION < 5mm	-	-	-	-
INDURATION 5 – 10mm	-	-	-	-
INDURATION 10 - 15mm	(n=21) 100%	(n=6) 100%	(n=4) 75%	-
INDURATION >15mm	-	(n=2) 25%	-	(n=2) 100%
TOTAL NUMBER OF CASES	21	8	4	2

SMEAR FOR ACID FAST BACILLI

Fluorescent staining technique was used for making smears for tubercle bacilli Smears were made from the discharge in selected cases, Using fluorescent technique smear for tubercle bacilli was demonstrated only in 2 cases of scrofuloderma (6%), Tissue smear was also done but bacilli could not be demonstrated.

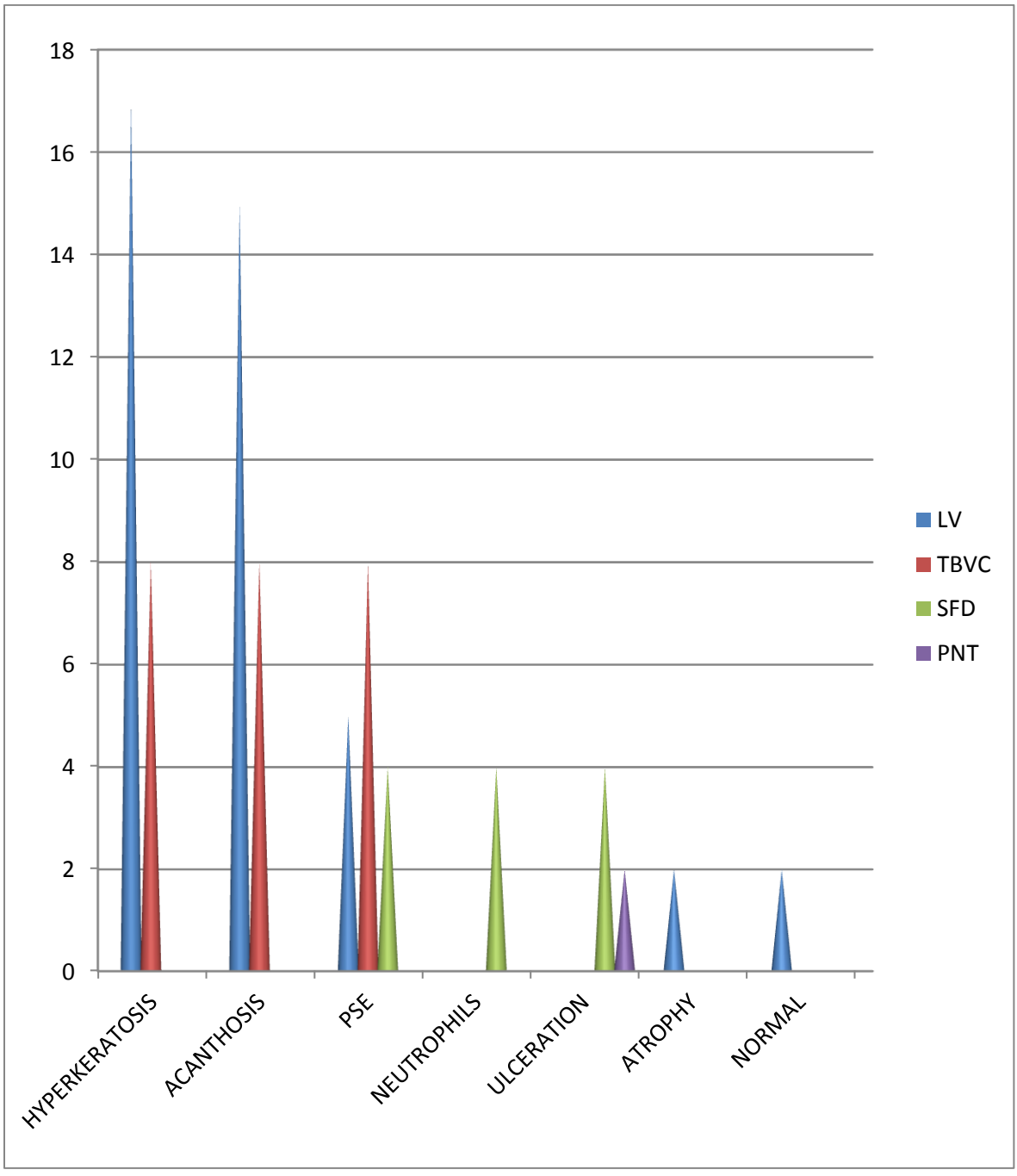
HISTOPATHOLOGICAL FEATURES OF CUTANEOUS TUBERCULOSIS

EPIDERMAL CHANGES IN EACH TYPE OF CUTANEOUS TUBERCULOSIS

TABLE 14

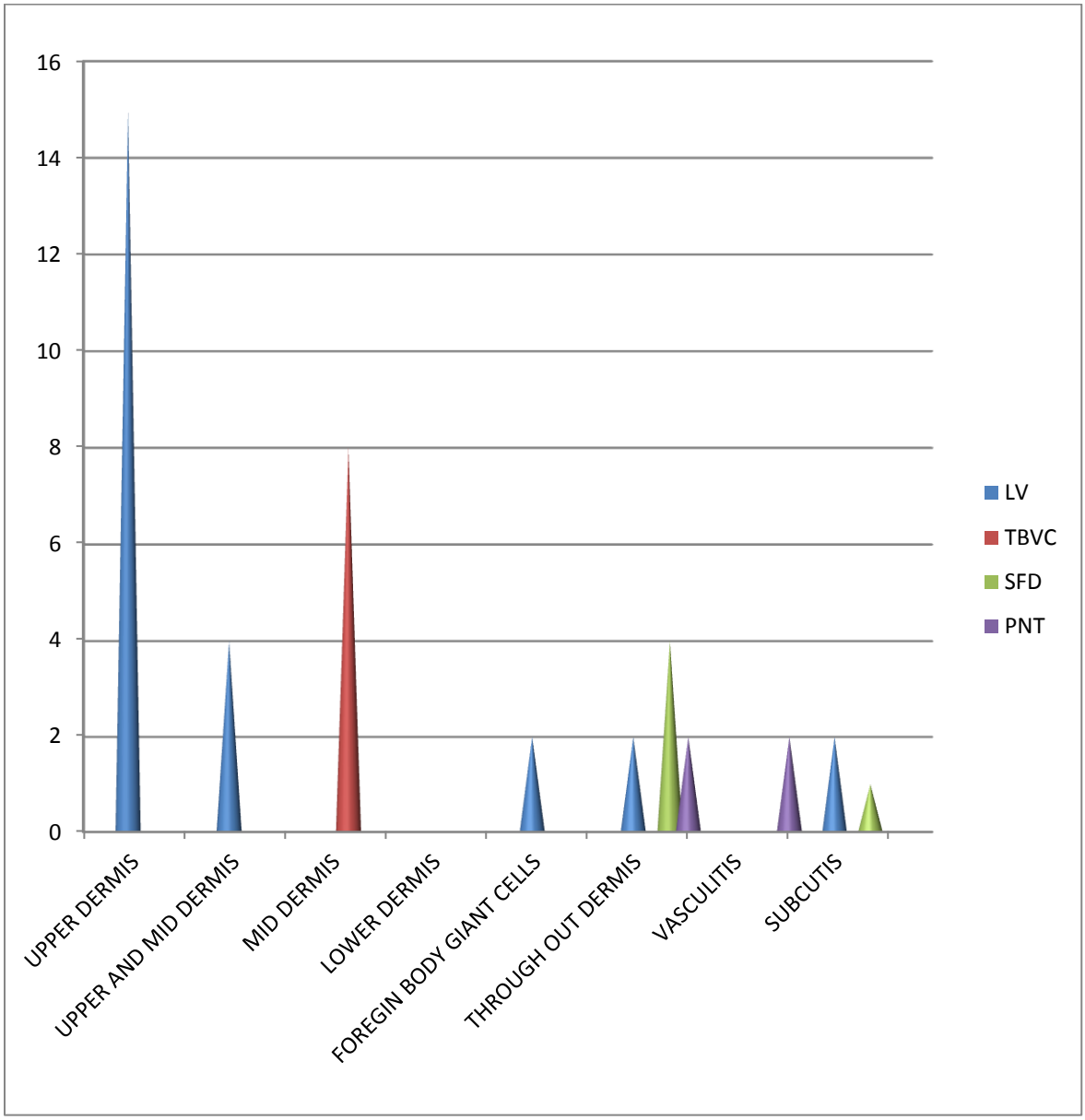
EPIDERMAL CHANGES	LV	TBVC	SFD	PNT
HYPERKERATOSIS	17	8	-	-
ACANTHOSIS	15	8	-	-
PSEUDOEPITHELIOMATOUS HYPERPLASIA (PSE)	5	8	4	-
NEUTROPHILS	-	-	4	-
ULCERATION	-	-	4	2
ATROPHY	2	-	-	-
NORMAL	2	-	-	-

FIGURE 8: EPIDERMAL CHANGES IN EACH TYPE



Among 21 cases of Lupus vulgaris, epidermal changes were seen 19 cases (90%). Hyperkeratosis was seen in 17 cases (81%), Acanthosis was seen in 15 cases (71%), Pseudoepitheliomatous hyperplasia was seen in 5 cases (24%), Atrophy were seen in 2 cases (10%) and epidermis was normal in 2 cases (10%). Among 8 cases of Tuberculosis verrucosa cutis, Hyperkeratosis, Acanthosis and Pseudoepitheliomatous hyperplasia was seen in 8 cases (100%). Among 4 cases of Scrofuloderma, Ulceration of epidermis was seen all the 4 cases (100%), Neutrophils seen in 4 cases (100%) and Pseudoepitheliomatous hyperplasia was seen at the edge of the ulcer in 4 cases (100%). Among 2 cases of Papulonecrotic tuberculid, ulceration of epidermis was seen in 2 cases of papulonecrotic tuberculid. (Table 14, Figure 8)

FIGURE 9: POSITION OF GRANULOMA AND INFILTRATES IN DERMIS AND SUBCUTIS EACH TYPE OF CUTANEOUS TUBERCULOSIS



DERMAL AND SUBCUTIS CHANGES IN EACH TYPE OF

CUTANEOUS TUBERCULOSIS

TABLE 15

POSITION OF GRANULOMA AND INFILTRATE	**EPITHELIOID GRANULOMAS WITH LYMPHOHISTIOCYTIC INFILTRATE WITH LANGHANS' GIANT CELLS IN EACH TYPE**			
	LV	**TBVC**	**SFD**	**PNT**
UPPER DERMIS	15	-	-	-
UPPER AND MID DERMIS	4	-	-	-
MID DERMIS	-	8	-	-
LOWER DERMIS	-	-	-	-
FOREGIN BODY GIANT CELLS	2	-		
THROUGH OUT DERMIS	2	-	4	2
VASCULITIS	-	-	-	2
SUBCUTIS	2	-	-	-

Dermal changes were observed in all the 35 cases (100%).

Out of 21 cases of Lupus vulgaris, Epithelioid granulomas with Lymphohistiocytic infiltrate with Langhans' type of giant cells in upper dermis (15cases,71%) and in upper and mid dermis (4 cases,19%) and throughout the dermis (2 cases,10%). Foreign body giant cells were seen in (2 cases, 10%). Out of 10 cases of Tuberculosis verrucosa cutis, Epithelioid granulomas with lymphohistiocytic infiltrate with Langhans' type of giant cells seen in mid-dermis in all cases (10 cases, 100 %).

Out of 4 cases of Scrofuloderma, Epithelioid granulomas with lymphohistiocytic infiltrate with Langhans' type of giant cells seen throughout the dermis (4 cases, 100%) and also in subcutis (1 case, 25%)

Epithelioid cells with Lymphohistiocytic infiltrate with Langhans' type giant cells and few neutrophils along with Lymphocytic vasculitis and Leukocytoclastic vasculitis in the dermis was seen in each case of Papulonecrotic tuberculid.

Subcutis changes were observed in 2 cases (10%) of Lupus vulgaris where the infiltrates were found throughout the dermis and also involving the subcutis. Caseation and bacilli were not seen in all the histological sections studied. Special staining by fite's staining could not detect AFB in tissue sections.

Among 14 verrucous plaques,

8 verrucous plaques on histopathological examination showed areas of epidermal hyperplasia of varying degree from acanthosis to pseudoepitheliomatous hyperplasia. Neutrophils seen in the epidermis and close to the epidermis (in 4 cases 50%) and epithelioid granulomas along with lymphohistiocytic infiltrate and Langhans' type of giant cells in the mid dermis(in all 8 cases,100%) which were found to be consistent with Tuberculosis verrucosa cutis while the other 6 verrucous plaques showed varying proportions of acanthosis and pseudoepitheliomatous hyperplasia of the epidermis along with lymphohistiocytic infiltrate and moderate number of Langhans' type of giant cells in upper dermis and mid dermis (4 cases,19%) and also throughout the dermis and subcutis (2 cases,10%) which were found to be consistent with lupus vulgaris with verrucous type - 'Lupus vulgaris verrucosus'. While the remaining plaques with gyrate outline and plaques with psoriasiform appearance with soft to firm consistency which were clinically strongly suspicious of Lupus vulgaris confirmed by histopathological features where they found to be consistent with lupus vulgaris. (Figure 9, Table 15, Table 16)

TABLE 16

HISTOPATHOLOGY	LV	TBVC	SFD	PNT
EPIDERMAL CHANGES	Total = 21	Total = 8	Total = 4	Total =2
HYPERKERATOSIS	(n=17) 81%	(n=8) 100%	-	-
ACANTHOSIS	(n=15) 71%	(n=8) 100%	-	-
PSEUDOEPITHELIOMATOUS HYPERPLASIA (PSE)	(n=5) 33%	(n=8) 100%	n=4(100%)	-
NEUTROPHILS	-	(n=4) 50%	n=4(100%)	n=2(100%)
ULCERATION	-	-	n=3(100%)	n=2(100%)
ATROPHY	(n=2) 10%	-	-	-
NORMAL	(n=2) 10%	-	-	-
EPITHELIOID GRANULOMAS, LYMPHO HISTIOCYTIC INFILTRATE AND LANGHANS' GIANT CELLS				
IN THE UPPER DERMIS	(n=21) 100%	-	-	-
UPPER AND MID DERMIS	n=4 (19%)	-	-	-
IN THE MID DERMIS	-	(n=8) 100%	-	-
IN THE LOWER DERMIS	-	-	-	-
THROUGHOUT THE DERMIS	(n=2) 10%	-	n=4(100%)	n=2(100%)
IN THE SUBCUTIS	(n=2) 10%	-	n=1(25%)	-
FOREIGN BODY IN THE DERMIS	(n=2) 10%	-	-	-
VASCULITIS	-	-	-	n=2(100%)

THERAPEUTIC RESPONSE TO ANTITUBERCULAR TREATMENT

TABLE 17

TYPE OF CUTANEOUS TUBERCULOSIS	**TIME TAKEN FOR THERAPEUTIC RESPONSE**	**TIME TAKEN FOR COMPLETE HEALING**
LUPUS VULGARIS	2 - 3 WEEKS	3 - 4 MONTHS
TUBERCULOSIS VERRUCOSA CUTIS	3 - 4 WEEKS	4 - 5 MONTHS
SCROFULODERMA	3 - 4 WEEKS	2 - 3 MONTHS
PAPULONECROTIC TUBERCULID	2 - 3 WEEKS	4 - 5 MONTHS

DISCUSSION

A total of 35 cases of cutaneous tuberculosis were observed. The overall incidence of cutaneous tuberculosis was 0.33% which is comparable with studies done by Pandhi et al,[12] Patra et al.[55]

The most common type of cutaneous tuberculosis was Lupus vulgaris 21cases (60%), followed by Tuberculosis verrucosa cutis 8 cases (23%), scrofuloderma 4 cases (11%) and papulonecrotic tuberculid 2 cases (6%).

As in our study, Lupus vulgaris was the most common type which is found to be consistent with most of the studies done by many authuors Ramesh et al,[56] Rahman MH et al,[57] L.Padmavathy et al,[58] Nithin et al,[59] Ranjan et al.[60]

Lupus vulgaris, the most common type followed by Tuberculosis verrucosa cutis and scrofuloderma in the order of frequency, which is found to be consistent with studies done by Chong LY et al,[61] Rahman MH et al,[57] M.naved uzzafar et al.[62]

Incidences of Lupus vulgaris and Tuberculosis verrucosa cutis in our study were 60% and 23% when compared with the study done by Rahman MH et al,[57] L.Padmavathy et al,[58] Ranjan et al,[60] M.naved uz zafar, et al,[62] where the incidence of lupus vulgaris was 54%,33%,40.63%,38.29% and the incidence of Tuberculosis verrucosa cutis were 29.09%, 27.4%,18.75%,19.4% respectively.

Incidence of Scrofuloderma in our study was 11% when compared to studies done by Ranjan et al,[60] M.naved uz zafar, et al,[62] Rahman MH et al,[57] where the incidence of Scrofuloderma were 4.69%,14.89%,21.82% respectively.

Incidence of Papulonecrotic tuberculid was 6% when compared with studies done by Nithin D et al[59] and Ranjan et al[60] where the incidence of Papulonecrotic tuberculid was 6.52% and 3.13% respectively.

Females dominated the case load by 19 cases (54%) and males 16 cases (46%) Male to female ratio was 1:1.2which is found to be consistent with studies done by Ramesh et al,[56] Vashisht et al,[20] Kumar et al,[22] Pandhi et al.[12]

Incidence of lupus vulgaris was more in females 13 cases (68%) compared to males where the incidence was 8 cases (50%).

While incidence of tuberculosis verrucosa cutis was more in males 7 cases (44%) compared to females where the incidence was 1 case (5%) which is consistent with study done by Ranjan et al.[60]

Age group most commonly affected was 20 - 35 years.

Majority of the cases occurred in second and third decades of life which is consistent with study done by Sehgal et al.[23]

Youngest person affected was 12 yrs female.

Oldest person affected was 62 yrs female.

The average duration of lupus vulgaris was 1 year, Average duration of Tuberculosis verrucosa cutis was 3 years and less than one year for scrofuloderma while duration of lupus vulgaris, tuberculosis verrucosa cutis and scrofuloderma was 3 years to 11 months, 4 years to 10 months and one month to 4 years respectively in a study done by Padmavathy et al.[58]

Duration of Papulonecrotic tuberculid was between few months to less than a year which is found to be consistent with study done by Jordaan et al.[63]

The most common complaint was Solitary plaque in 29 cases (94%). Multiple lesions seen in 2 cases (6%) of Papulonecrotic tuberculid. Pruritus was present in 22 cases (63%), Discharge from the lesion was present in 15 cases (43%), Spreading lesion and healing was present in 10 cases (28%), Pruritus was the major symptom present in 6 cases (75%) of Tuberculosis verrucosa cutis cases, 14 cases (66%) of Lupus vulgaris cases and 2 cases (6%) of Papulonecrotic tuberculids cases. Similar feature were also seen in other studies.[20,22,12,58,56,62]

There was no history of preceding trauma as it was attributed to the causation of the disease in some studies.[58,60]

Family history of Pumlonary tuberculosis and ATT was present in 2 cases (6%) while study by L. Padmavathy et al[58] where family history of ATT was (23%).

There was no family history of cutaneous tuberculosis.

There was no past history of tuberculosis in our cases.

There was no coexisting systemic conditions like diabetes mellitus, hypertension and visceral tuberculosis, while a study by Binayak Chandra Dwari et al[64] where diabetes mellitus followed by hypertension, pulmonary tuberculosis and sporotrichosis were found to be coexisting with cutaneous tuberculosis.

Lupus vulgaris was commonly seen over the upper extremity in 9 cases (43%) and lower extremity in 8 cases (38%). While study done previously by authors Ramesh et al,[56] Vashisht et al,[20] Kumar et al,[22] Pandhi et al [12] where they found lower extremity and face were the most common affected sites. Face was involved in one case of lupus vulgaris. One case of lupus vulgaris simulating as elastosis perforans serpiginosa over the breast and one case of lupus vulgaris caused tear of earlobe, both of these were later confirmed histologically.

Lower and upper extremities (hands, feet, knees, elbows) were the most commonly affected sites in tuberculosis verrucosa cutis 6 cases (75%) in our study
which is consistent with study done by most of the Indian authors Vashisht et al,[20] Kumar et al,[22] Pandhi et al.[12]

Neck was the commonly affected site in all the 4 cases (100%) of scrofuloderma which is consistent with study done by authors M.naved uz zafar, et al,[62] Ramesh et al,[56] Vashisht et al,[20] Kumar et al,[22] Pandhi et al.[12]

Symmetrical involvement of lower and upper extremities was found 2 cases (5.7%) of papulonecrotic tuberculid found to be consistent with study done by Vashisht et al,[20] CS Sirka.[65]

General physical examination, systemic examination and vitals were normal in all the patients studied. BCG scar was present in all the 35 cases (100%) while BCG vaccination was done in 75% in a study by L. Padmavathy et al.[58] The immunity offered by BCG is controversial with protection against TB ranging from 0% in southern India to 75% in western countries.[58]

Morphological patterns of lupus vulgaris seen in our study typical gyrate plaques with atrophic areas (8 cases, 38%), psoriasiform type (7 cases, 33%) and verrucous type (6 cases, 29%).While Tuberculosis verrucosa cutis presented with typical verrucous plaques (8 cases, 100%) and areas of softening in the plaque and cribs of pus expressed from the plaque (50% cases). Scrofuloderma presented with irregular ulcer with shaggy margins and Papulonecrotic tuberculids with erythematous papules with central necrosis symmetrically distributed over the

extensor extremities. These morphological features were same as described by some authors.[19,21]

Regional lymphadenopathy was seen in one case of tuberculosis verrucosa cutis while generalised lymphadenopathyin each case of lupus vulgaris and papulonecrotic tuberculid while a study by Tappeiner G et al,[18] found lymphadenopathy in cases with tuberculosis verrucosa cutis and lupus vulgaris with inguinal group of lymph nodes most commonly involved. The presence of regional lymphadenopathy was viewed as a feature of dissemination of the disease more often with gumma and scrofuloderma.[13] Generalised lymphadenopathy was common feature in papulonecrotic tuberculid in many studies.[63,66]

Routine blood investigations were normal with the exception of increased erythrocyte sedimentation rate in all the 35 cases (100%) and positive HIV ELISA in each case of Tuberculosis verrucosa cutis and Scrofuloderma which is consistent with the study done by Nitin D.Chaudhari et al[59] where ESR was raised in all the cases studied, and positive HIV ELISA in 2 cases.

AFB smears for tubercle bacilli using was done by fluorescent technique and found to be positive only in 2 cases (6%) of scrofuloderma while study by vashisht et al,[10] showed AFB positivity in most commonly in scrofuloderma and lupus vulgaris. As

only a little percentage of cases have positive smear, clinical morphology and histological features are considered important for the diagnosis.[58,61]

Mantoux positivity seen in all 35 cases (100%). Induration 10-15mm was seen in21 cases (100%) of lupus vulgaris,6 cases (75%) of tuberculosis verrucosa cutis (37%) 5 cases of erythema nodosum 14% and 3 cases of scrofuloderma (9%) and strongly positive more than 15 mm was seen in 2 cases of papulonecrotic tuberclid (6%) and 2 cases of tuberculosis verrucosa cutis (25%) while mantoux reactivity varied between 66 to100 % in some studies.[12,20,56, 67]

Co-association of pulmonary tuberculosis was ruled out in every case in our study vigilantly by thoracic physician after a thorough work up as it was observed by kivanc et al[68] that 2.96% cases of cutaneous tuberculosis can be associated with pulmonary tuberculosis. No such association was found in our study.

Histopathological study for all the 35 cases was done and the various histological parameters were recorded.

Epidermal changes were observed in 33 cases (94%) and Normal epidermis was seen in 2 cases (10%) of Lupus vulgaris. Hyperkeratosis was seen in 17 cases (81%) of Lupus vulgaris and all 10 cases (100%) of Tuberculosis verrucosa cutis.

Acanthosis was seen in 15 cases (71%) of Lupus vulgaris and all 10 cases (100%) of Tuberculosis verrucosa cutis. Pseudoepitheliomatous hyperplasia was seen in 5 cases (24%) of Lupus vulgaris and all 10 cases (100%) of Tuberculosis verrucosa cutisand at the edge of the ulcer in all the 4 cases (100%) of scrofuloderma.

Combination of both Acanthosis and Pseudoepitheliomatous hyperplasia was seen in in 4 cases (19%) of Lupus vulgaris and 7 cases (87%) of Tuberculosis verrucosa cutis. Neutrophils in the epidermis were found 4 cases (50%) of Tuberculosis verrucosa cutis and in all the 4 cases (100%) of scrofuloderma. Ulceration of epidermis was seen all the cases (100%) of scrofuloderma and papulonecrotic tuberculid. Atrophy of epidermis was seen in 2 cases (10%) of Lupus vulgaris.

Dermal changes were observed in all the 35 cases (100%).

Out of 21 cases of Lupus vulgaris, Epithelioid granulomas with Lymphohistiocytic infiltrate with Langhans' type of giant cells in upper dermis (15cases,71%) and in upper and mid dermis (4 cases,19%) and throughout the dermis (2 cases,10%). Foreign body giant cells were seen in (2 cases,10%)Out of 10 cases of Tuberculosis verrucosa cutis, Epithelioid granulomas with lymphohistiocytic infiltrate with Langhans' type of giant cells seen in mid-dermis in all cases (10 cases,100 %).

Out of 4 cases of Scrofuloderma, Epithelioid granulomas with lymphohistiocytic infiltrate with Langhans' type of giant cells seen throughout the dermis(4 cases,100%) and also in subcutis (1 case, 25%)

Epithelioid cells with Lymphohistiocytic infiltrate with Langhans' type giant cells and few neutrophils along with Leukocytoclastic vasculitis and Lymphocytic vasculitis in the dermis was seen in each case of Papulonecrotic tuberculid.

Subcutis changes were observed in 2 cases (10%) of Lupus vulgaris where the infiltrates were found throughout the dermis and also involving the subcutis.

Caseation and bacilli were not seen in all the histological sections studied.

Special staining by fite's staining could not detect AFB in tissue sections.

These histological features were found to be consistent with many authors.[30,62,69]

Among 14 verrucous plaques,

8 verrucous plaques on histopathological examination showed areas of epidermal hyperplasia of varying degree from acanthosis to pseudoepitheliomatous hyperplasia. Neutrophils seen in the epidermis and close to the epidermis (in 4 cases 50%) and epithelioid granulomas along with lymphohistiocytic infiltrate and Langhans' type of giant cells in the mid dermis (in all 8 cases,100%) which were found to be consistent with Tuberculosis verrucosa cutis while the other 6 verrucous plaques showed varying proportions of acanthosis and

pseudoepitheliomatous hyperplasia of the epidermis along with lymphohistiocytic infiltrate and moderate number of Langhans' type of giant cells in upper dermis and mid dermis (4cases,19%) and also throughout the dermis and subcutis (2 cases,10%) which were found to be consistent with lupus vulgaris with verrucous type - 'Lupus vulgaris verrucosus'. While the remaining plaques with gyrate outline and plaques with psoriasiform appearance with soft to firm consistency which were clinically strongly suspicious of Lupus vulgaris confirmed by histopathological features where they found to be consistent with lupus vulgaris. All these histological correlation were done in accordance with the authors Weedon[30] and Lever.[69]

After clinical and pathological confirmation, category one anti tubercular treatment was started and the patients were followed up at monthly intervals for 6 months.

Earliest therapeutic response was seen in lupus vulgaris, papulonecrotic tuberculid early as 2 – 3 weeks while tuberculosis verrucosa cutis and scrofuloderma took 3 – 4 weeks to start showing therapeutic response. This is in contrast to general clinical response of cutaneous tuberculosis to ATT usually takes 5 – 6 weeks to show a therapeutic response. Scrofuloderma and lupus vulgaris showed good and early response as one may expected to see in these cases.[70] Scrofuloderma healed with

residual scarring in 2 – 3 months and lupus vulgaris healed with residual atrophic scars in 3 – 4 months even before the completion of ATT which is consistent with study done by Rahman et al.[57] While tuberculosis verrucosa cutis, papulonecrotic tuberculid took 4 – 5 months to heal with residual scarring.

SUMMARY

- Incidence of cutaneous tuberculosis was 0.33 per 1000.
- The most common type was Lupus vulgaris (21cases, 60%) followed by other types viz. Tuberculosis verrucosa cutis (8 cases, 23%), Scrofuloderma 4 cases 11% and Papulonecrotic tuberculid (2 cases, 6%).
- Male to female ratio was 1 : 1.2
- Age group most commonly affected was in first 3 decades.
- Lupus vulgaris more commonly seen in females while Tuberculosis verrucosa cutis in males.
- Most common site of affection was Upper extremity for Lupus vulgaris and Lower extremities for Tuberculosis verrucosa cutis and Neck for Scrofuloderma and Upper and Lower extremities for Papulonecrotic tuberculid.
- An interesting case of Lupus vulgaris simulating as elastosis perforans serpiginosa over the breast and in one case caused tear of earlobe were observed.
- No personal past or family history of cutaneous tuberculosis in any patient.
- Family history of tuberculosis and antitubercular treatment was seen in 2 cases.

- There was no Co-association of pulmonary tuberculosis with cutaneous tuberculosis in our study.
- No systemic disease association was found with cutaneous tuberculosis.
- ESR was raised in all the 35cases.
- Bacilli positive in two cases of scrofuloderma.
- Histopathology compatibility was seen according to the clinical morphology.
- Therapeutic response was observed within 4 weeks.

CONCLUSION

Cutaneous tuberculosis constitutes 1 % of all cases of tuberculosis. Clinical morphological types are closely in accordance with the host immunity. With the Lupus vulgaris is being considered by some as the most common type while Scrofuloderma by some authors in various studies with the rising incidence of HIV/AIDS. Tuberculosis verrucosa cutis was previously found to be the most common type now being seen less often and Tuberculids are being reported intermittently by some authors. Diagnosis was based mainly on demonstration of tubercle bacilli in the lesions and by detection of mycobacterium tuberculosis DNA by PCR which is now being used more commonly in the recent times.

In our study , bacilli were demonstrable in 2 cases of scrofuloderma by visualisation of smears made from the discharge under fluorescent microscopy. Caseation and bacilli could not be seen in the histological sections studied and diagnosis was mainly based on the clinical morphology of the lesion and histological features with all the cases showing poor to well-formed granulomas along with varying numbers of Langhans' type giant cells with lymphohistiocytic infiltrate and neutrophils in some cases.

After clinical and histological confirmation, we found that Lupus vulgaris was the most common type followed by other types.

To conclude a constellation of clinical and histological features were proved vital in the diagnosis of cutaneous tuberculosis in cases where bacilli could not be made out in the sections and where the facility for PCR is not available.

ANNEXURE

BIBLIOGRAPHY

1. Penneys NS, Leonardi CL, Cook S, et al. Identification of Mycobacterium tuberculosis DNA in five different types of cutaneous lesions by the polymerase chain reaction. Arch Dermatol. 1993;129 (12):1594–1598.
2. De Silva HJ, Goonetilleke AK, De Silva NR, Amarasekera LR, Jayawickrama US. Erythema induratum (of Bazin) in a patient with endometrial tuberculosis. Postgrad Med J. 1988;64: 242–244.
3. Chen YH, Yan JJ, Chao SC et al. Erythema induratum: a clinicopathological and polymerase chain reaction study. J Formos Med Assoc 2001; 100: 244-9.
4. Schneider JW, Jordaan HF. The histopathological spectrum of erythema induratum of Bazin. Am J Dermatopathol 1997; 18: 323–33.
5. Forstrom L, Hannuksela M. Antituberculous treatment of erythema induratum Bazin. Acta Derm Venereol (Stockh) 1970;
6. Pinkus H, Mehregan AH. A Guide to Dermatohistopathology. 2nd ed. New York, NY: Appleton-Century Crofts; 1976: 235.
7. Milligan A, Chen K, Graham-Brown RAC. Two tuberculides in one patient—a case report of papulonecrotic tuberculide and erythema induratum occurring together. Clin Exp Dermatol. 1990;15: 21–23.

8. Kumar PJ, Clark ML. Clinical Medicine (3rd Ed.).London: Bailliere Tindall, 1994
9. Garcia-Porrua C, Gonzalez-Gay MA, VazquezCaruncho M, et al. Erythema nodosum, etiologic and predictive factors in a defined population. Arthritis Rheum 2000;43 (3):584-92.
10. James W. Steger, M.D. and Terry L.M.D.Cutaneous tuberculosis. Captain, Medical Corps, U.S. Navy; Head, Dermatology Clinic, Naval Hospital, San Diego, California 92134-5000
11. Bhutto AM, Solangi A, Khaskhely NM et al. Clinical and epidemiological observations of cutaneous tuberculosis in Larkana, Pakistan. Int J Dermatol 2002; 41:159–65
12. Pandhi D, Reddy BS, Chowdhary S, Khurana N. Cutaneous tuberculosis in Indian children: The importance of screnning for involvement of internal organs. J Eur Acad Dermatol Venerol 2004;18: 546-51.
13. Kumar B, Muralidhar S. Cutaneous tuberculosis: a twenty-year prospective study.Int J Tuberc Lung Dis. 1999 Jun; 3 (6):494-500.
14. James W. Steger, M.D. and Terry L.M.D.Cutaneous tuberculosis. Captain, Medical Corps, U.S. Navy; Head, Dermatology Clinic, Naval Hospital, San Diego, California 92134-5000

15. Hanekom W. Abel B, Scriba TJ. Immunological protection against tuberculosis. SAMJ 2007;97:973 - 978.
16. Wadee AA, Kuschke RH. Expression of accessory molecules in the presence of Mycobacterium tuberculosis extracts on unstimulated and activated monocytes. South Afric J Epidemiol Infect 2003;18:89 - 95.
17. Sehgal N, Gupta R, Bose M, Saha K. Immunohistopathological spectrum in cutaneous tuberculosis. Clin Exp Dermatol 1993;18:309 - 313.
18. Tappeiner G. Tuberculosis and infections with atypical mycobacteria.In: Klaus Wolff, Lowell A, Goldsmith, Stephen I. Katz, Barbara A.Gilchrest, Amy S.Pallere, David J. Leffell, editors. Fitzpatrick's Dermatology in General Medicine 7th ed. McGraw-Hill; 2008. p 1768-78
19. Yates VM. Mycobacterial infections. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. Rook's Textbook of Dermatology. 8th ed. Sussex; Wiley Blackwell: 2010 p 31.1- 41
20. Vashisht P, Sahoo B, Khurana N et al. Cutaneous tuberculosis in children and adolescents: a clinicohistiological study. J Eur Acad Dermatol Venerol 2006; **21**:40–7.

21. James W. Steger, M.D. and Terry L.M.D.Cutaneous tuberculosis. Captain, Medical Corps, U.S. Navy; Head, Dermatology Clinic, Naval Hospital, San Diego, California 92134-5000
22. Kumar B, Rai R, Kaur I et al. Childhood cutaneous tuberculosis: a study over 25 years from northern India. Int J Dermatol 2001; **40**: 26–32
23. Sehgal VN, Srivastava G, Khurana VK et al. An appraisal of epidemiologic, clinical, bacteriologic, histopathologic and immunologic parameters in cutaneous tuberculosis. Int J Dermatol 1987; **26**: 521–6.
24. Ramesh V. Sporotrichoid cutaneous tuberculosis. Clin Exp Dermatol 2007; **32**:680–2.
25. Mahaisaviriya P, Chaiprasert A, Manonukul J et al. Scrofuloderma and Sweet's syndrome. Int J Dermatol 2002; **41**: 28–31.
26. Nachbar F, Classen V, Nachbar T et al. Oral tuberculosis: detection by polymerase chain reaction. Br J Dermatol 1996; **135**: 106–9.
27. Bickley LK. Acute miliary tuberculosis of the skin in AIDS. J Am Acad Dermatol. 1994;30:143–144.
28. Kounis NG, Constantinidis K. Unusual tuberculous skin manifestations. Practitioner 1979; **222**: 390–3.
29. Giudice P, Bernard E, Perrin C et al. Unusual cutaneous manifestations of miliary tuberculosis. Clin Infect Dis 2000; **30**: 201.

30. Bacterial and rickettsial infections.In: Weedon D. Weedon's skin pathology 3rd ed. China; Elesvier: 2010. P. 556-72.
31. Lantos G, Fisher BK, Contreras M. Tuberculous ulcer of the skin. J Am Acad Dermatol
32. Tan HH, Seow CS. A review of cutaneous granulomas and lupus vulgaris following BCG vaccination in a skin hospital in Singapore. Ann Acad Med Singapore 2002; **31**: 663–5.
33. Rademaker M, Lowe DG, Munro DD. Erythema induratum (Bazin's disease). J Am Acad Dermatol. 1989;21:740–745.
34. Tay YK. Erythema nodosum in Singapore. Clin Exp Dermatol 2000;25 (5):377-80.
35. Davies PDO. Clinical Tuberculosis (2nd Ed.). London: Chapman & Hall Medical, 1998.
36. Wallgren A. The timetable of tuberculosis. Tubercle 1948;29:245-51.
37. Davies PDO, Ormerod LP. Case Presentations in Clinical Tuberculosis. London: Arnold, 1999.
38. Dall L, Long L, Stanford J. Poncet's disease:tuberculous rheumatism. Rev Infect Dis 1989;11 (1): 105-7.
39. Kakakhel KU, Fritsch P. Cutaneous tuberculosis. Int J Dermatol. 1989;28:335–362.

40. Izumi AK, Matsunaga J. BCG vaccine-induced lupus vulgaris. Arch Dermatol. 1982;118:171–172.
41. Tauro LF, Martis JS, George C, Kamath A, Lobo G, Hegde BR. Tuberculous Mastitis Presenting as Breast Abscess. OMJ 2011 Jan; 26(1):53-55.
42. Handjani F, Delir S, Sodafi M et al. Lupus vulgaris following bacille Calmette– Guérin vaccination. Br J Dermatol 2001; 144: 444–5.
43. Izumi AK, Matsunaga J. BCG vaccine-induced lupus vulgaris. Arch Dermatol 1982; **118**: 171–2.
44. Sasmaz R, Altinyazar HC, Tatlican S et al. Recurrent lupus vulgaris following repeated BCG (bacillus Calmette Guérin) vaccination. J Dermatol 2001; **28**:762–4.
45. Horowitz O, Meyer J. The safety record of BCG vaccination and untoward reactions after vaccination. Adv Tuberc Res 1957; **8**: 254–71.
46. Atasoy M, Aliagaoglu C, Erdem T et al. Scrofuloderma following BCG vaccination. Pediatr Dermatol 2005; **22**: 179–80.
47. Dostrovsky A, Sagher F. Dermatological complications of BCG vaccination. Br J Dermatol 1963; **75**: 181–92.

48. Muto J, Kuroda K, Tajima S. Papular tuberculides post-BCG vaccination: case report and review of the literature in Japan. Clin Exp Dermatol 2006; **31**: 611–12.

49. Serfling U, Penneys NS, Leonardi CL. Identification of Mycobacterium tuberculosis DNA in a case of lupus vulgaris. J Am Acad Dermatol. 1993; 28: 318–322.

50. Taniguchi S, Chanoik M, Hamada T. Scrofuloderma: The DNA analysis of mycobacteria by the polymerase chain reaction. Arch Dermatol. 1993;129 (12):1618–1619.

51. Deglitz K, Steidl M, Thomas P, Plewig G, Volkenant M. Aetiology of tuberculids. Lancet. 1993;341:239–240.

52. Deglitz K, Messer G, Schirren H, Classen V, Meurer M. Successful treatment of erythema induratum of Bazin following rapid detection of mycobacterial DNA by polymerase chain reaction. Arch Dermatol. 1993; 129 (12):1619–1620.

53. Ramam M,tejasvi T, manchanda Y, sharma S, mittal R. Indian J Dermatol Venereol Leprol. 2007 Jul-Aug;73(4):243-6.

54. Ramam M, Mittal R, Ramesh V. Implications for a therapeutic test of diagnosis. Int J Dermatol. 2005 Feb;44(2):121

55. Patra AC, Gharami RC, Banerjee PK. A profile of cutaneous tuberculosis. Indian J Dermatol 2006;51:105-7

56. Ramesh v, Mishra RS, Beena KR, Mukherjee A. A study of cutaneous tuberculosis in children. Pediatr Dermatol 1999;16:264-9

57. Rahman MH, Anasri NP, Ahmed KGS, Hadiuzzaman M, Nipa NI, Islam S, Bhuyan MKJ, Mumu SA, Chowdhury IJ. Stud of Determinant Profiles of Cutaneous Tuberculosis in Bangladesh

58. L. Padmavathy, L. Lakshmana Rao, T. Pari, N. Ethirajan and B. Krishnaswamy. Lupus vulgaris and tuberculosis verrucosa cutis a clinical, pathological and epidemiological study of 71 cases [Indian J Tuberc 2008; 55:203-209]

59. Nitin D.Chaudhari, Hemant V. Talaniker, Palak Deshmukh, Sanjeev Gupta. A clinicopathological study of cutaneous tuberculosis at Pune district, Maharashtra. Int J Pharm Biomed Sci 2012, 3(4), 181-183 ISSN No: 0976-5263

60. Ranjan Agrawal, Mukta Kumar, Parbodh Kumar Cutaneous tuberculosis- a clinico-pathological study indian journal of medical specialities 2012;3(2):138-142

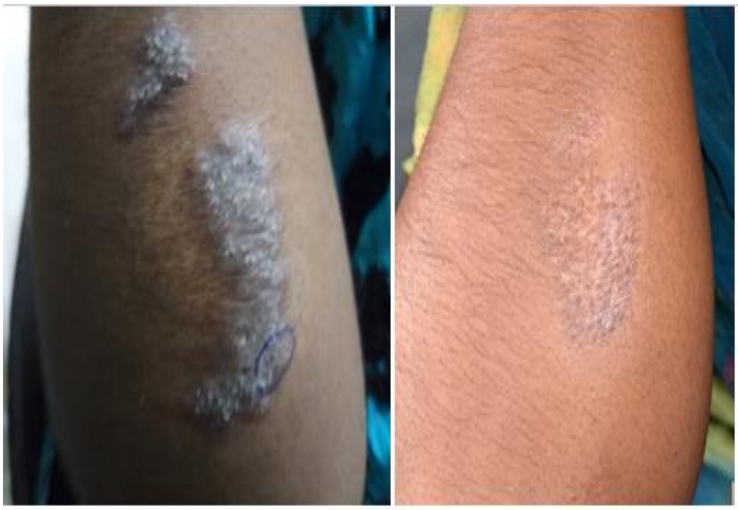
61. Chong LY, Lo KK. Cutaneous tuberculosis in Hong Kong: a ten year retrospective study. Int J Dermatol 1995; **34**: 26–9.

62. M. Naved uz Zafar.Pattern of cutsneous tuberculosis as identified by morphological skin lesions at Jinnah post graduate medical center Karachi. Gomal Journal of Medical Sciences January-June 2010, Vol. 8, No.1
63. Jordaan HF, Van Niekerk DJ, Louw M. Papulonecrotic tuberculid. A clinical, histopathological, and immunohistochemical study of 15 patients. Am J Dermatopathol. 1994 Oct;16(5):474-85.
64. Binayak Chandra Dwari, Arnab Ghosh, Raju Paudel, and P Kishore. A clinicoepidemiological study of 50 cases of cutaneous tuberculosis in a tertiary care teaching hospital in pokhara, Nepal. Indian J Dermatol. 2010 Jul-Sep; 55(3): 233–237.
65. CS Sirka, S Jena, T Padhi, S Mishra, P Mohanty. Papulo necrotic tuberculid : An imitator. Indian J Dermatol 2005;50:231-2
66. Nasser Rashid Dar, Naeem Raza, Omar Zafar and Salahuddin Awan. Papulonecrotic Tuberculids Associated with Uveitis.Journal of the College of Physicians and Surgeons Pakistan 2008, Vol. 18 (4): 236-238.
67. Sehgal VN, Jain MK, Srivastava G. Changing pattern of cutaneous tuberculosis: A prospective study. Int JDermatol. 1989;28: 231–236.
68. Kivanç-Altunay I, Baysal Z, Ekmekçi TR, and Köslü A. Incidence of cutaneous tuberculosis in patients with organ tuberculosis. International J of Dermatol 2003; 42: 197-200.

69. Lucas S. Bacterial diseases.In: Elder DE, Elenitsas R, Murphy FG, Xu X, Johnson B.L, editors. Lever's histopathology of the skin. 10th ed. Philadelphia: Lippincott; 2009. p.539-78

70. B M G D Yasaratne, D M Madegedara.Tuberculosis of the skin.Journal of the Ceylon College of Physicians,2010,41,83-88

PHOTOGRAPHS

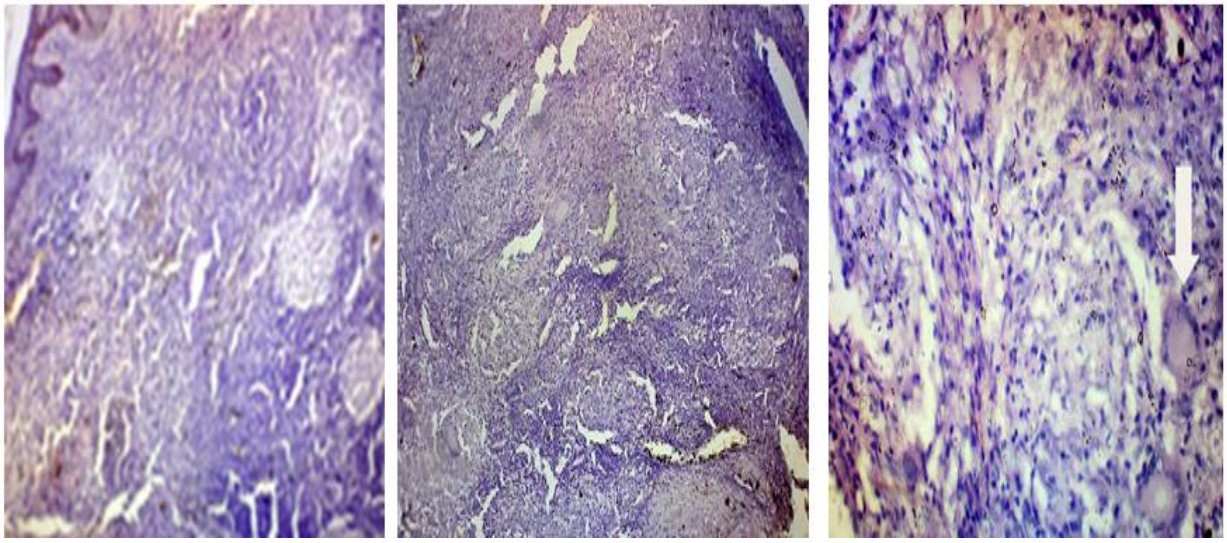


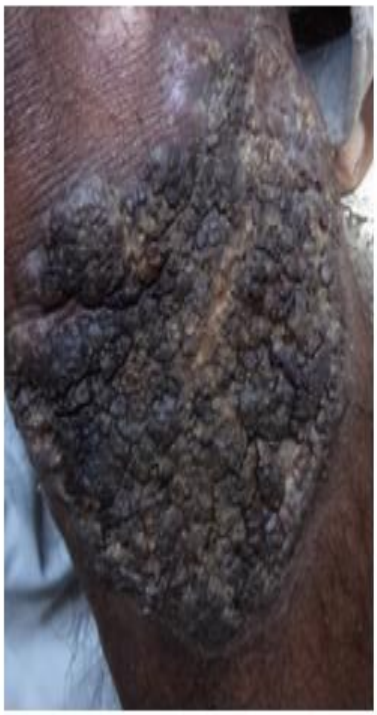
LUPUS VULGARIS

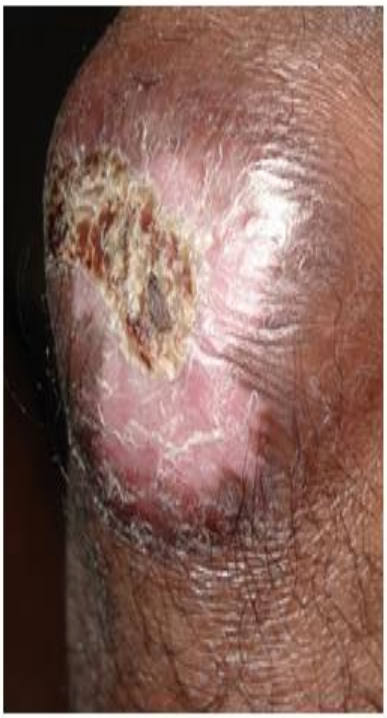
Clinical pictures before and after Antitubercular treatment.

Histopathologically,

Granulomatous infiltrate throughout the Dermis with Langhans' type giant cells

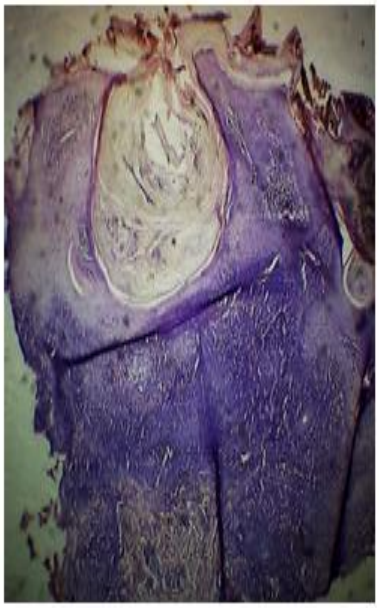


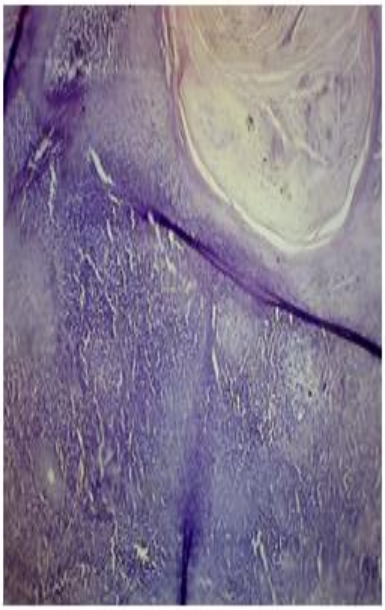


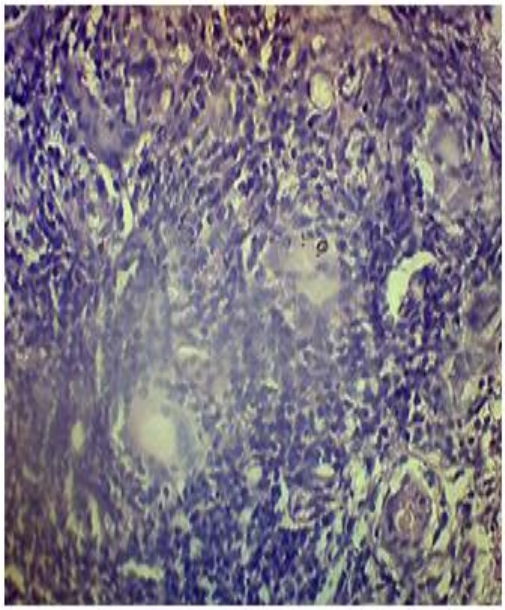


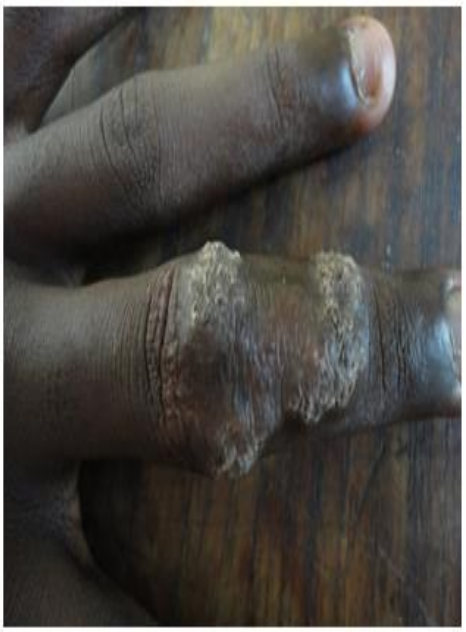
LUPUS VULGARIS VERRUCOSUS

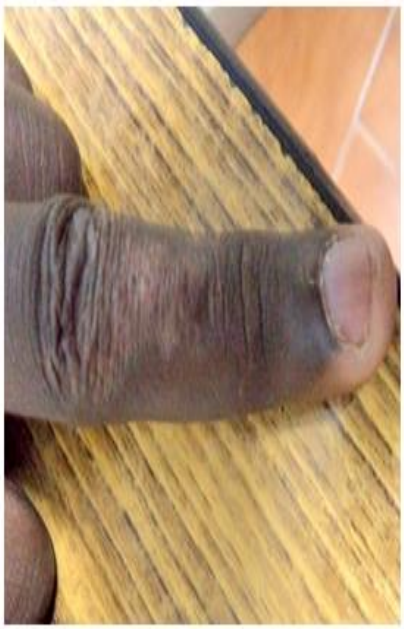
Clinical pictures before and after treatment.Histopathologically, Epithelioid granulomas with Lymphohistiocytic infiltrate along with Langhans' type giant cells in the upper dermis.







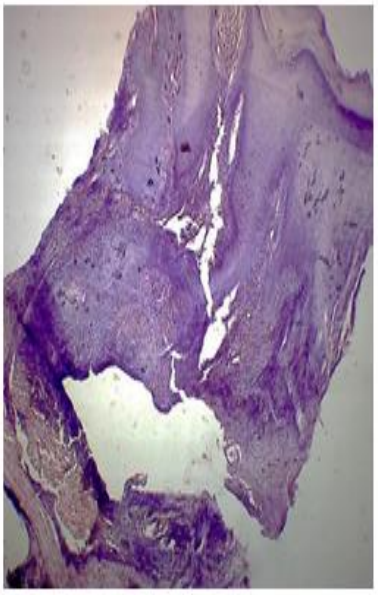


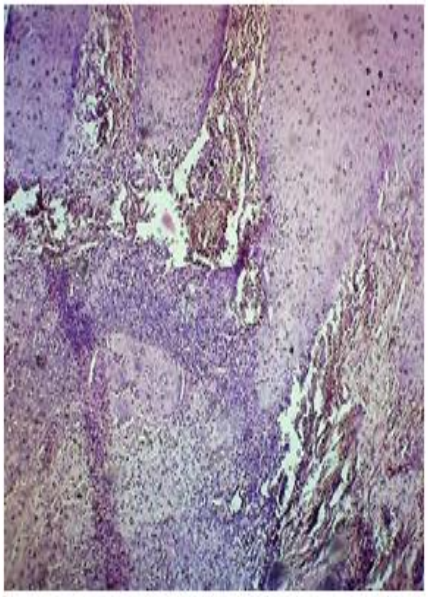


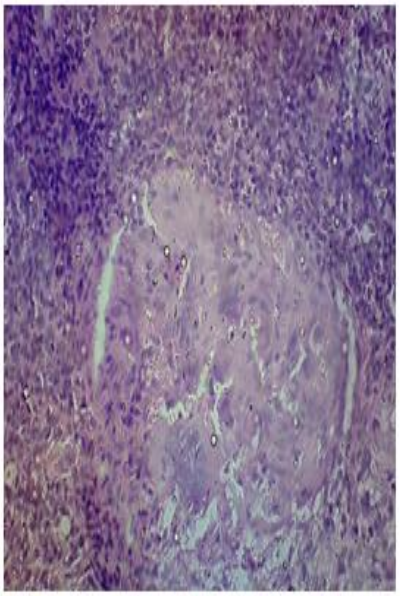
LUPUS VULGARIS

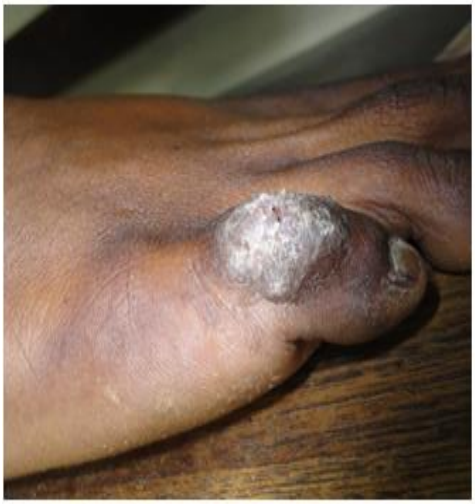
Clinical pictures before and after treament.Histopathologically,

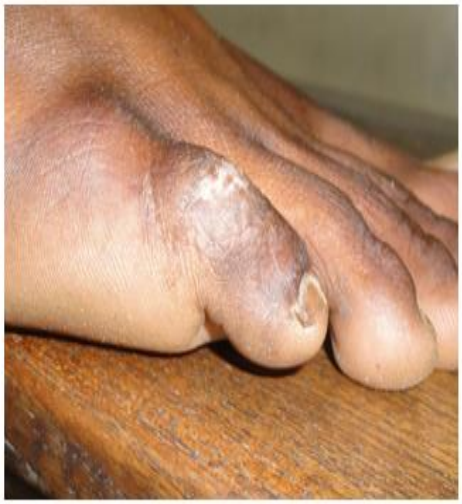
Epidermal hyperplasia with Epithelioid granulomas with Lymphohistiocytic infiltrate in Upper dermis.

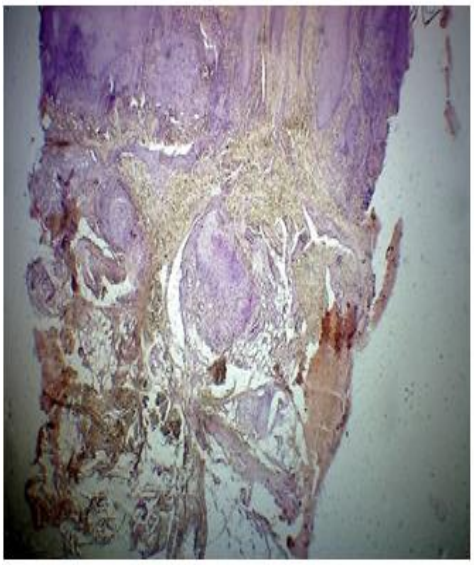


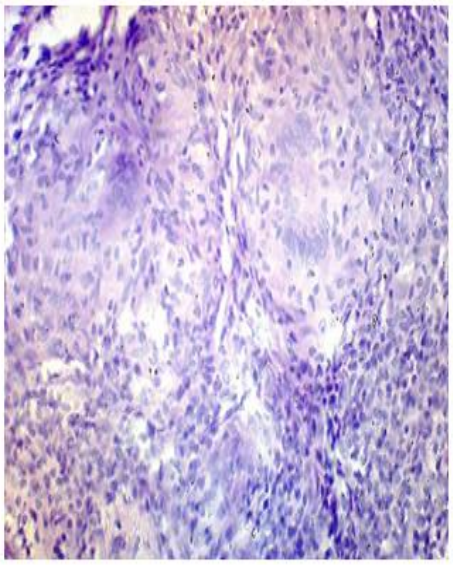






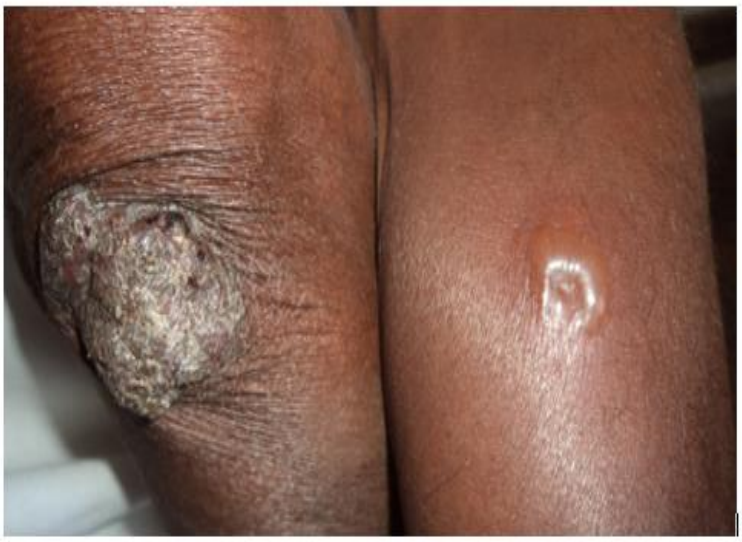






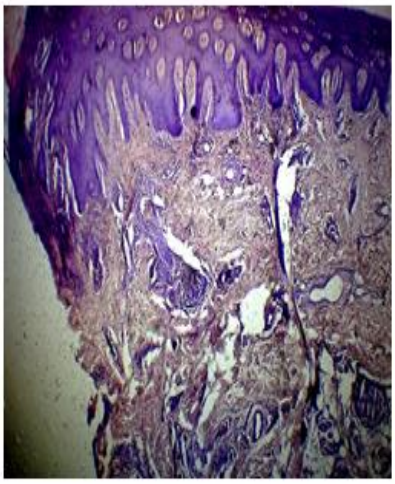
TUBERCULOSIS VERRUCOSA CUTIS

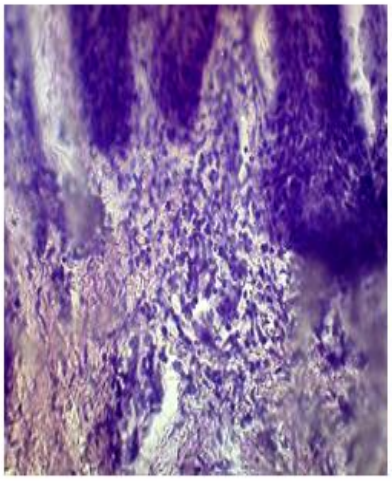
Clinical pictures before and after Antitubercular treatment. Histopathologically, Epithelioid granuloma with Lymphohistiocytic infiltrate in the Mid-dermis.

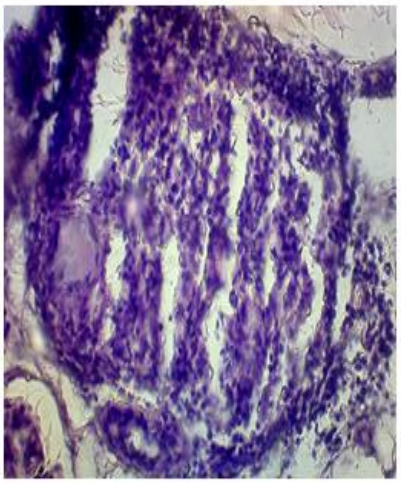


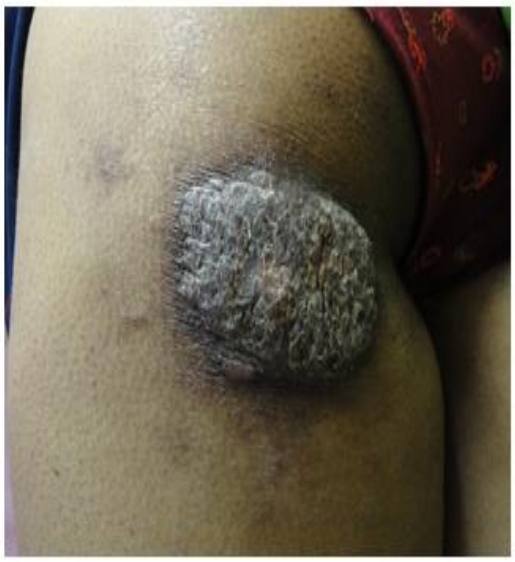
TUBERCULOSIS VERRUCOSA CUTIS

Clinical picture with Strongly Positive Mantoux reactivity.Histopathologically, Neutrophils in and close to epidermis with Pseudoepitheliomatous hyperplasia with Mid-dermal granulomatous infiltrate with Langhans' type giant cell.



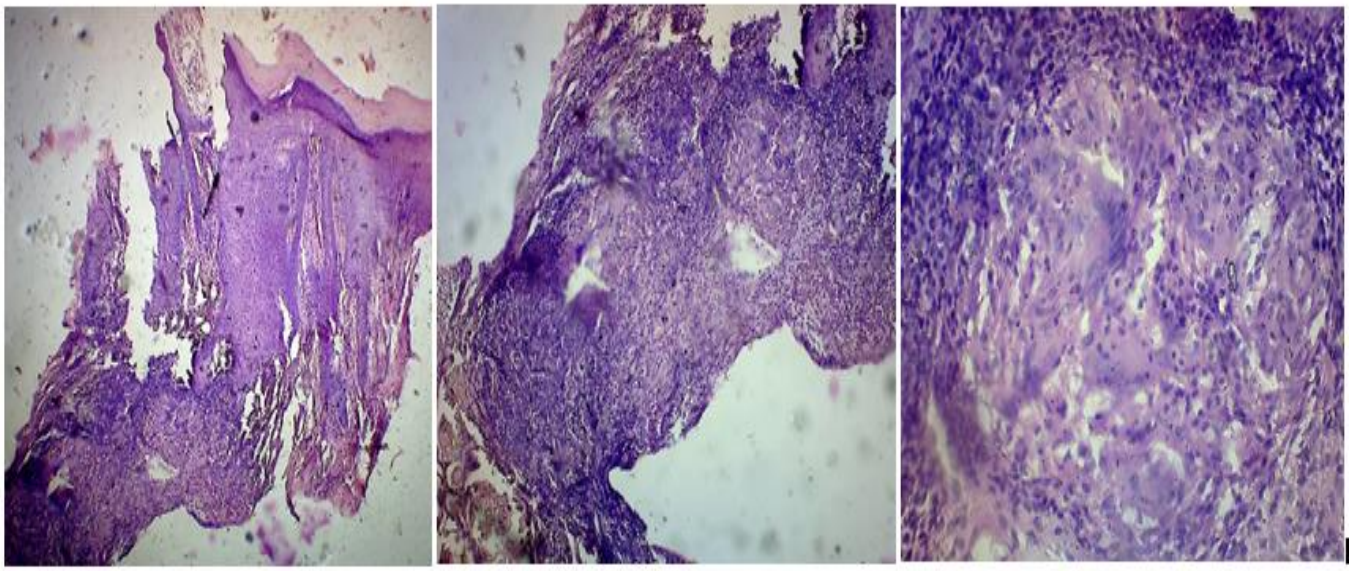


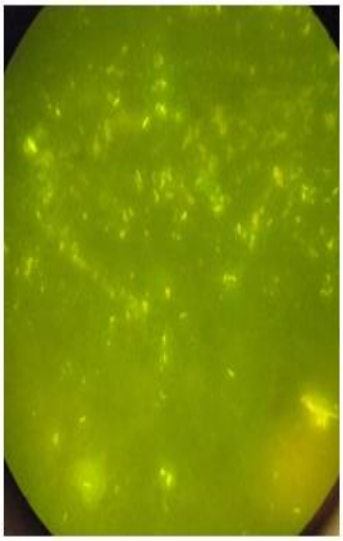
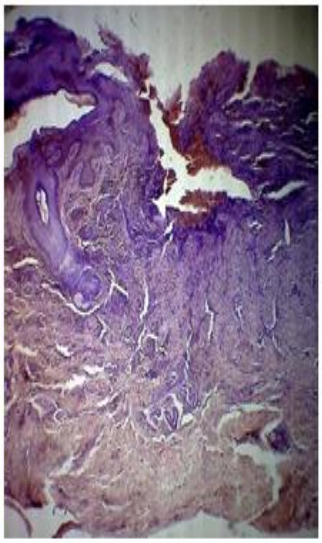
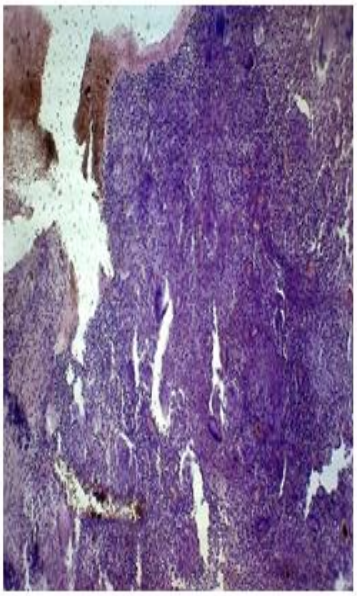
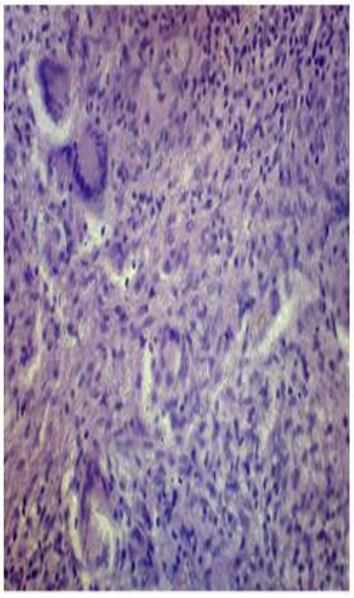
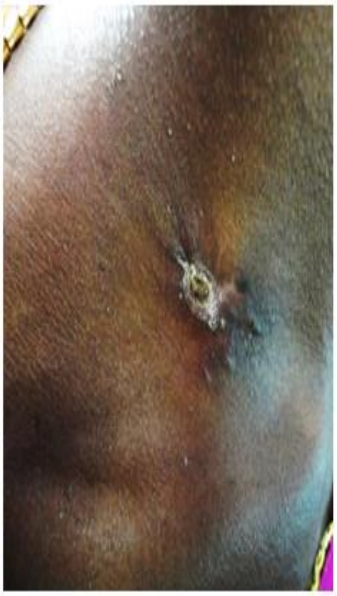




TUBERCULOSIS VERRUCOSA CUTIS

Hyperkeratosis with Pseudoepitheliomatous hyperplasia. Mid-dermal Epithelioid granuloma surrounded by a mantle of Lymphohistiocytic infiltrate.

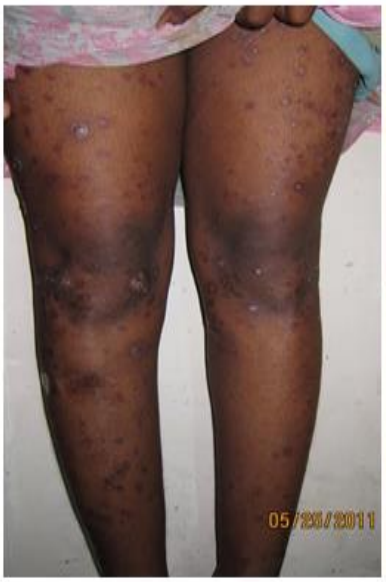


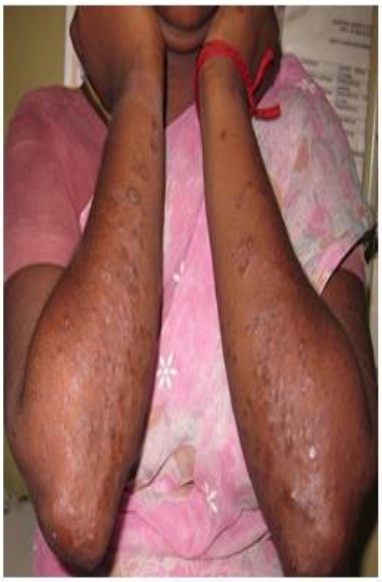







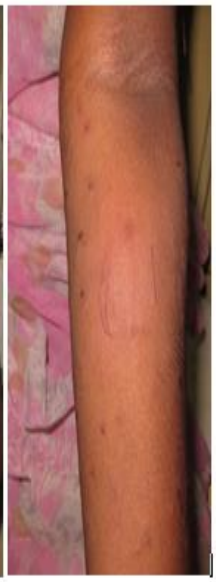
SCROFULODERMA

Clinical picture with bacilli.Histopathologically,

Epidermal ulceration with Pseudoepitheliomatous hyperplasiaat the edge of the ulcer with granulomatousinfiltrate in the dermis with Langhans' type giant cells&Follow up picture after Antitubercular treatment.



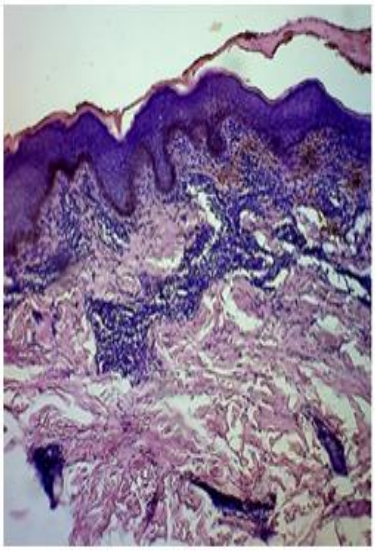


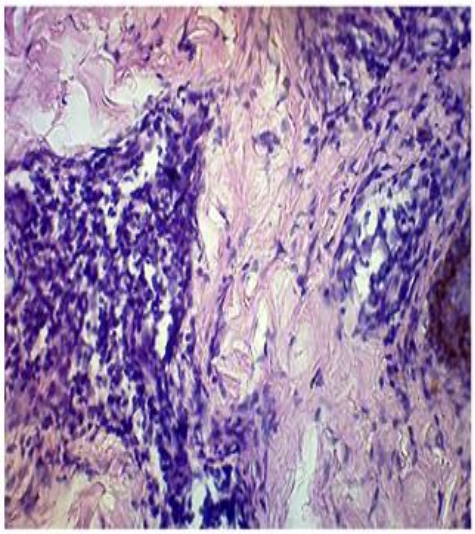


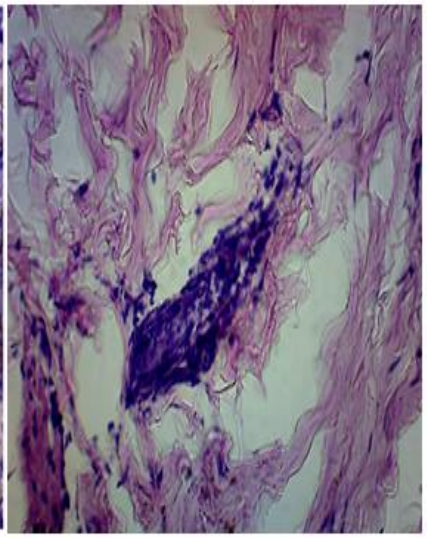
PAPULONECROTIC TUBERCULID

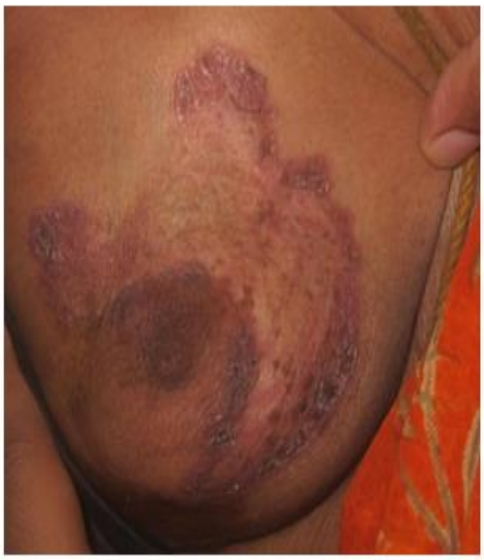
Extensor aspectof the Extremities are affected with Positive Mantoux reactivity. Histopathologically,

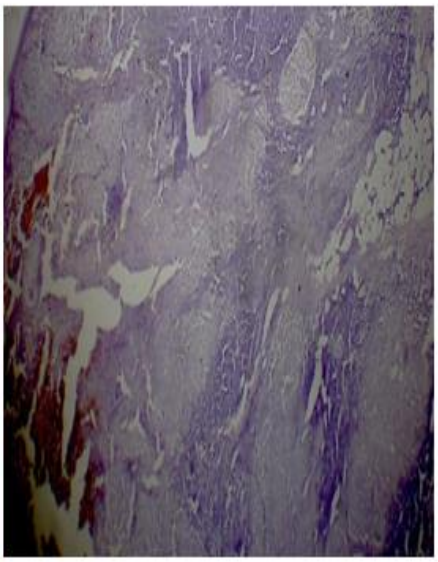
Lymphohistiocytic infiltrate in the Dermis with Lymphocytic vasculitis.

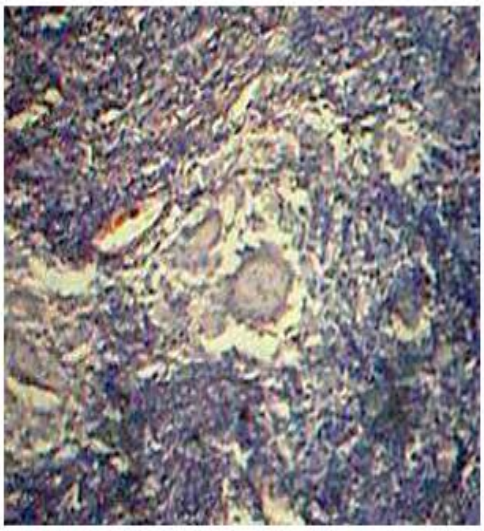


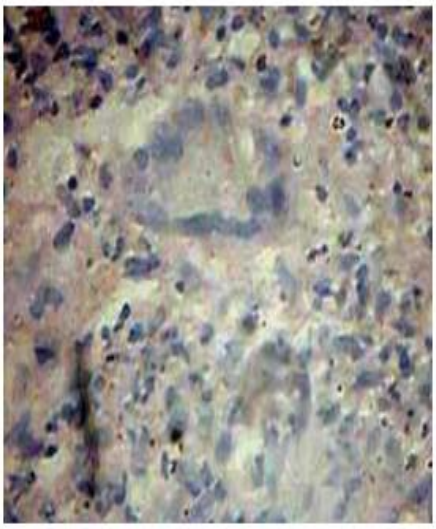












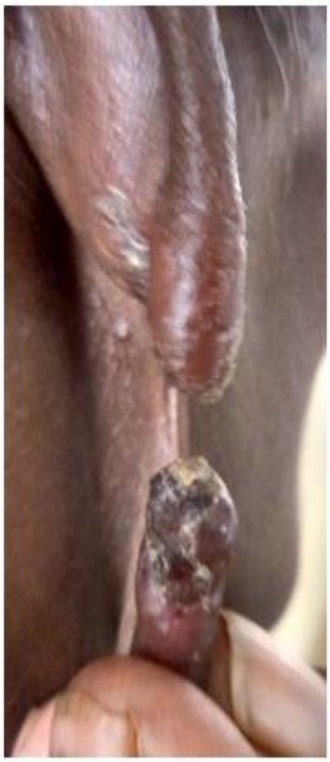
LUPUS VULGARIS MIMICKING ELASTOSIS PERFORANS SERPIGINOSA

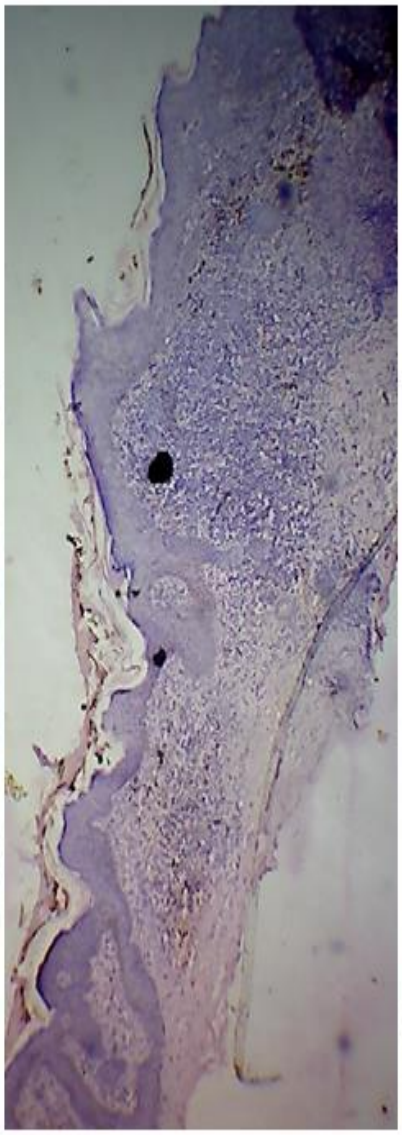
It was confirmed onHistopathology as Lupus vulgaris by Granulomatous infiltrate in the Dermis with Langhans' type giant cells.

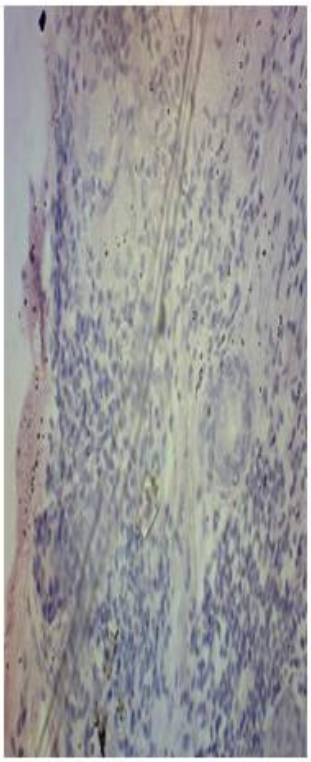
LUPUS VULGARIS RESULTED IN TEAR OF EARLOBE:

Granulomatous infiltrate with

Langhans' type giant cells in upper dermis







PROFORMA

CASE NO:

DATE :

NAME :

AGE/SEX :

OCCUPATION:

ADDRESS:

PHONE NO :

CHIEF COMPLAINTS :

DURATION:

SITE :

Face :Upper limb :

Trunk :Lower limb :

EVOLUTION OF THE LESION :

A)PROGRESSING :1) Increase in size

B) STATIC

2) New lesions

C)REGRESSING

ASSOCIATED COMPLAINTS : Asymptomatic

Symptomatic - Pain, Itching, Discharge

OTHER : History of cough and expectoration, History of fever, History of trauma

PAST HISTORY : skin lesions in the past, history of taking ATT

FAMILY HISTORY : Similar skin lesions, history of cough and expectoration and ATT

GENERAL EXAMINATION : Pallor :

BCG scar :

Cyanosis :

Clubbing :

Lymphadenopathy :

Nutritional status/built :

Edema :

Icterus :

SYSTEMIC EXAMINATION :

RS :

PA:

CVS :

CNS:

DERMATOLOGICAL EXAMINATION:

PLAQUE

Site :

Definition: Well defined / ill defined

Colour : Verrucous/Psoriasiform

Surface changes : Scaly/Non scaly/Erosions/Crust/Ulcer

Surrounding skin : Normal/Erythema/Induration

Scar :

PAPULE : Number of lesions : Multiple/ Numerous

Site of distribution :

Pattern of arrangement : Follicular/Perifollicular/Nonfollicular

Consistency : Soft/Firm

Tenderness : Present/Absent

Consistency : Firm/Soft/hard

Dimensions:

Colour : Skin colored/Erythematous/Pigmented/Hypopigmented

Shape:Circumscibed/Flattopped

Surface changes :Scaly/Nonscaly/Necrotic/Crust

Scars : Flat/Depressed,

NODULE :Number of lesions :

Shape :Size :

Colour :Consistency :

Tenderness :

ULCER : Size :

Site : Margins :

Discharge :Floor :

Induration :Tenderness :

Underlying structure : Bone/Joint/Lymphnode

Surrounding skin : Normal/Erythema/Induration/Colour

Scar : Cribriform/Puckered

INVESTIGATIONS :

Complete blood count -

Mantoux test -

Chest X-ray -

Thoracic medicine opinion -

Smear for AFB -

Histopathology -

HIV ELISA -

Blood VDRL -

Diagnosis -

Treatment -

Follow up –

MASTERCHART

										EPIDERMAL CHANGES						GRANULOMA, LH INFL, LCG IN DERMIS															
SL NO.	NAME	AGE IN YRS	SEX	DI IN YRS	ITCHING	DISCHAR	PAIN	SITE	TYPE OF CUT TB	ULCER	HK	ATROPHY	ACAN	PSE	NEUTRO	UPPER	MID	LOWER	THRU DER	FBG	INF IN SC	VASUUTIS	LNPATHY	AFB SMR	AFB TISU	MANTOU	INC ESR	PUM TB	SYS TB	F H/O CT	F H/O PT	HIV ELISA
1	MEENA	12	F	3	P	A	A	FOOT	LV	A	A	-	-	-	-	P	-	-		P	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
2	SITHA	25	F	2	P	A	A	FACE	LV	A	A	-	-	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
3	PANDI	25	M	4	P	A	A	FA	LV	A	A	P	-	-	-	-	-	-	P	P	P	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
4	MUNISH	16	M	2	P	A	A	ELBOW	LV	A	A	P	-	-	-	-	-	-	P	-	P	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
5	JAYASHREE	23	F	1	P	A	A	FA	LV	A	P	-	P	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
6	VAISHNAVI	49	F	2	P	A	P	BREAST	LV	A	P	-	P	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
7	KATTAMAL	62	F	5	P	P	A	EARLOBE	LV	A	P	-	P	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
8	VINOTH	14	M	3	P	A	A	KNEE	LV	A	P	-	P	-	-	P	-	-		-	A	A	P	NEG	NEG	POSITIVE	P	A	A	A	A	POSITIVE
9	NAGARANI	25	F	4	P	A	A	ELBOW	LV	A	P	-	P	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
10	MAHALAKSHMI	23	F	3	P	A	A	KNEE	LV	A	P	-	P	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	P	NEG
11	YOGESH	18	M	2	P	A	A	FA	LV	A	P	-	P	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
12	VIGNESH	16	M	2	P	A	A	KNEE	LV	A	P	-	P	P	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
13	LATHA	32	F	3	P	A	A	AXILLA	LV	A	P	-	P	P	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
14	SURESH	28	M	2	P	A	A	KNEE	LV	A	P	-	-	P	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
15	SELVAM	27	M	3	A	A	A	HAND	LV	A	P	-	-	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
16	MUTHU	22	M	1	A	A	A	FOOT	LV	A	P	-	p	-	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
17	SUCHITRA	21	F	3	A	A	A	FOOT	LV	A	P	-	P	P	-	P	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
18	BHARATI	19	F	2	A	A	A	FA	LV	A	P	-	P	P	-	P	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
19	PAVITRA	15	F	2	A	A	A	FOOT	LV	A	P	-	P	-	-	P	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
20	BAANU	22	F	3	A	A	A	FA	LV	A	P	-	P	-	-	p	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
21	NANCY	21	F	2	A	A	A	ELBOW	LV	A	P	-	P	-	-	p	-	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
22	JAMES	29	M	5	P	A	A	HAND	TBVC	A	P	-	P	P	-	-	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
23	SANGAYYA	13	M	3	P	A	A	HAND	TBVC	A	P	-	P	P	-	-	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
24	SELVI	29	F	4	P	A	A	GLUTEAL	TBVC	A	P	-	P	P	-	-	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
25	UDAYAR	32	M	5	P	P	P	FOOT	TBVC	A	P	-	P	P	P	-	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
26	SELVARAJ	25	M	7	P	A	P	FOOT	TBVC	A	P	-	P	P	P	-	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	P	NEG
27	MUKHAN	23	M	6	P	A	A	KNEE	TBVC	A	P	-	P	P	P	-	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
28	MRURGAN	15	M	4	A	A	P	FOOT	TBVC	A	P	-	P	P	P	-	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
29	KANNAN	14	M	8	A	A	P	FOOT	TBVC	A	P	-	P	P	P	-	P	-		-	A	A	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
30	NAGAVENI	23	F	<1	A	P	P	NECK	SFD	P	-	-	-	P	P	-	P	P	P	-	A	A	P	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
31	PRABHAVATI	22	F	<1	A	P	A	NECK	SFD	P	-	-	-	P	P	-	P	-	P	-	A	A	P	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
32	PARAMESWSARI	21	F	<1	A	P	A	NECK	SFD	P	-	-	-	P	P	-	P	-	P	-	P	A	P	POSITIVE	NEG	POSITIVE	P	A	A	A	A	NEG
33	SENTHIL	32	M	<1	A	P	P	NECK	SFD	P	-	-	-	P	P	-	-	-	P	-	A	A	P	POSITIVE	NEG	POSITIVE	P	A	A	A	A	POSITIVE
34	UMA	29	F	<1	P	A	P	T, UL,LL	PNT	P	-	-	-	-	p	-	-	-	P	-	A	P	A	NEG	NEG	POSITIVE	P	A	A	A	A	NEG
35	NALLAMAL	25	F	<1	P	A	P	T, UL,LL	PNT	P	-	-	-	-	p	-	-	-	P	-	A	P	P	NEG	NEG	POSITIVE	P	A	A	A	A	NEG

KEYS TO MASTER CHART

M – MALE

F – FEMALE

A – ABSENT

P – PRESNET

NEG – NEGATIVE

T – TRUNK

UL – UPPER LIMB

LL – LOWER LIMB

CUT TB – CUTANEOUS TUBERCULOSIS

DI – DURATION OF ILLNESS

DISCHAR – DISCHARGE

HK – HYPERKERATOSIS

ACAN – ACNTHOSIS

PSE – PSEUDOEPITHELIOMATOUS HYPERPLASIA

NEUTRO – NEUTROPHILS

THRU DER – THROUGH OUT THE DERMIS

FBG – FOREIGN BODY GIANT CELLS

LH INFL – LYMPHOHISTIOCYTIC INFILTRATE

LCG – LANGHANS' TYPE GIANT CELLS

INF IN SC – INFILTRATES IN SUBCUTIS

LNPATHY – LYMPHADENOPATHY

AFB SMR – SMEAR FOR ACID FAST BACILLI

AFB TISU - ACID FAST BACILLI IN TISSUE SECTIONS

INC ESR – INCREASED ERYTHROCYTE SEDIMENTATION RATE

PUM TB – PUMONARY TUBERCULOSIS

SYS TB – SYSTEMIC TUBERCULOSIS

F H/O CT – FAMILY HISTORY OF CUTANEOUS TUBERCULOSIS

F H/O PT – FAMILY HISTORY OF PUMONARY TUBERCULOSIS

HIV ELISA – HUMAN IMMUNODEFICIENCY VIRUS ANTIBODY

TEST BY ENZYME LINKED IMMUNOASSAY

ABBREVATIONS

LV – LUPUS VULGARIS

TBVC – TUBERCULOSIS VERRUCOSA CUTIS

SFD – SCROFULODERMA

PNT – PAPULONECROTIC TUBERCULID

TB – TUBERCULOSIS

BCG – BACILLUS CALMETTE GUERIN

PSE – PSEUDOEPITHELIOMATOUS HYPERPLASIA

HIV ELISA – HUMAN IMMUNODEFICIENCY VIRUS ANTIBODY

TEST BY

ENZYME LINKED IMMUNOASSAY

PCR – POLYMERASE CHAIN REACTION

AFB – ACID FAST BACILLI

Th – T HELPER CELLS

DNA – DEOXYRIBONUCLEIC ACID

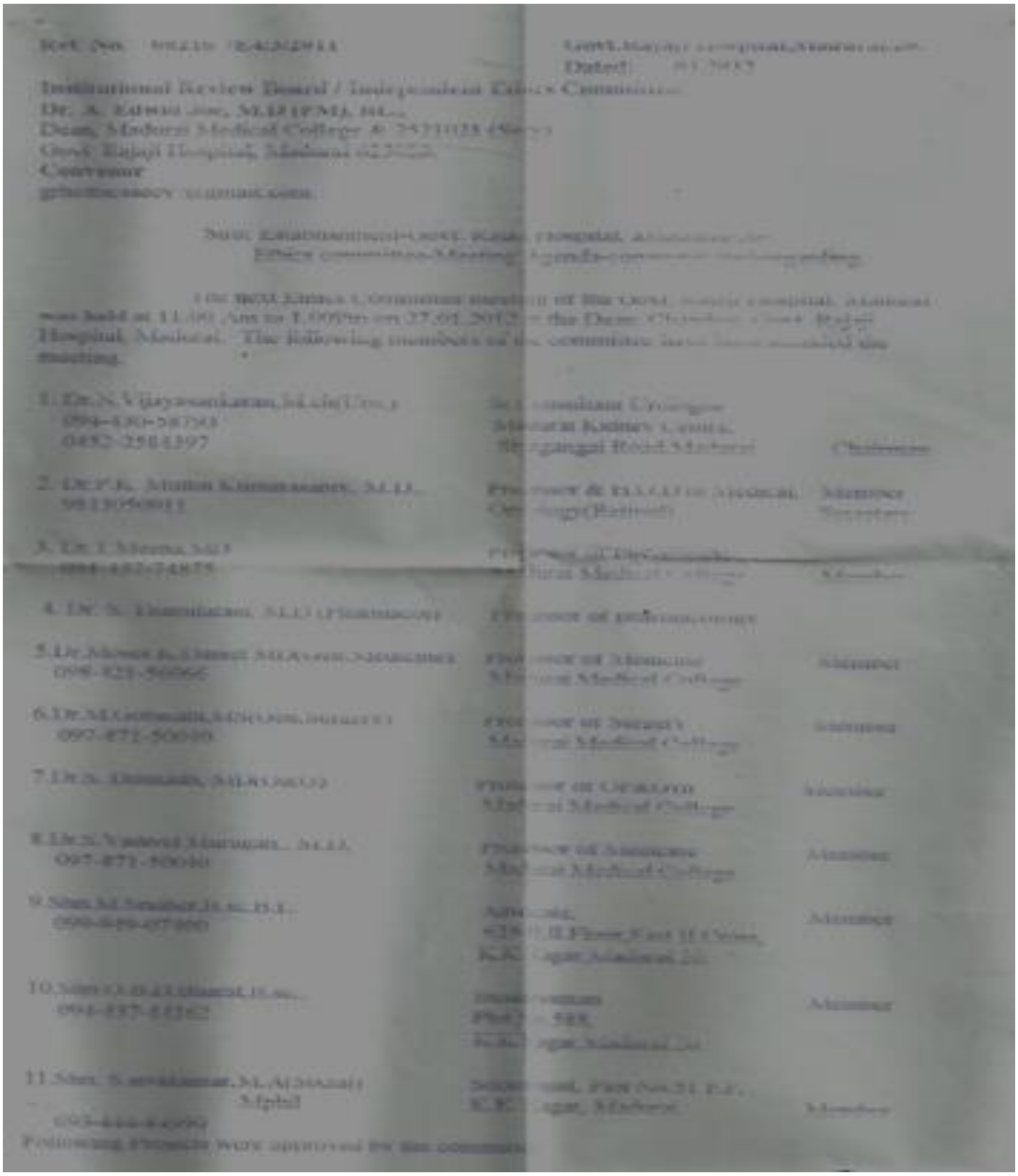
VDRL –VENEREAL DISEASE RESEARCH LABORATORY

OPD – OUT PATIENT DEPARTMENT

SL NO – SERIAL NUMBER

n – NUMBER

ETHICAL COMMITTEE CLEARANCE



Sl. No	Name of P.G.	Course	Name of the Project	Remarks
1.	Manjunatha P	PG M.D.(dvl)	Cutaneous tuberculosis a clinical and histopathologic study.	Approved

Please note that the investigator should adhere the following. She/He should get a detailed informed consent from the patients participants and maintain confidentially.

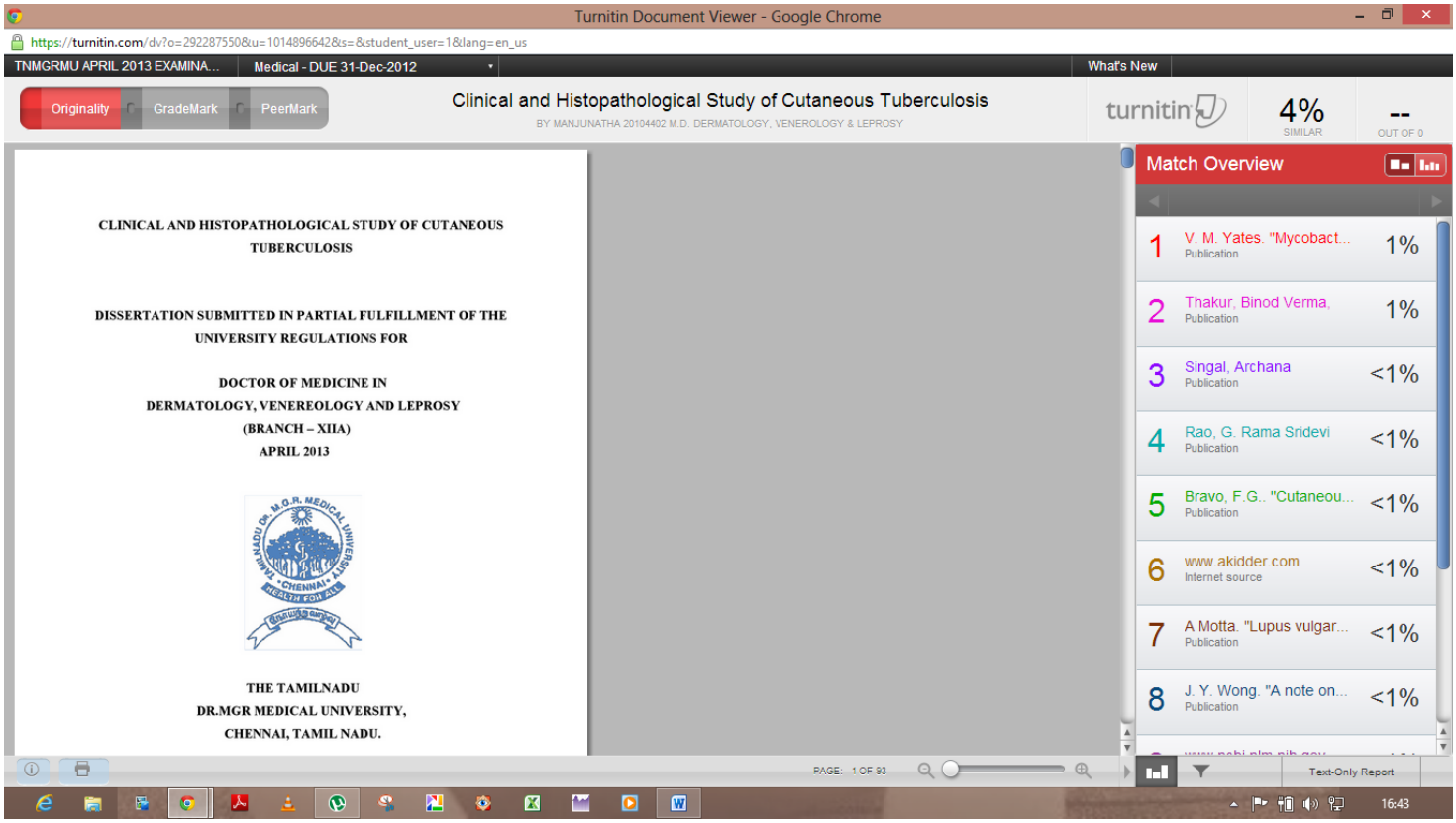
1. She/He should carry out the work without detrimental to routine activities as well as without extra expenditure to the institution to Government.
2. She/He should inform the institution Ethical Committee in case of any change of study procedure site and investigation or guide.
3. She/He should not deviate for the area of the work for which applied for Ethical clearance.
She/He should inform the IEC immediately, in case of any adverse events or serious adverse reactions.
4. She/he should abide to the rules and regulations of the institution.
5. She/He should complete the work within the specific period and apply for if any Extension of time is required She should apply for permission again and do the work.
6. She/He should submit the summary of the work to the Ethical committee on Completion of the work.
7. She/He should not claim any funds from the institution with/without the grant or on completion.
8.She/He should understand that the members of IEC have the right to monitor the work with prior intimation.

23/2

DEAN

To
All the above members and Head of the Departments concerned.
All the Applicants.

ANTIPLAGIARISM CERTIFICATE



turnitin

Your digital receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

Paper ID	292287550
Paper title	Clinical and Histopathological Study of Cutaneous Tuberculosis
Assignment title	Medical
Author	Manjunatha 20104402 M.D. Dermatology, Venerology & Leprosy
E-mail	manju2934@gmail.com
Submission time	24-Dec-2012 04:40PM
Total words	11481

First 100 words of your submission

CLINICAL AND HISTOPATHOLOGICAL STUDY OF CUTANEOUS TUBERCULOSIS DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE UNIVERSITY REGULATIONS FOR DOCTOR OF MEDICINE IN DERMATOLOGY, VENEREOLOGY AND LEPROSY (BRANCH – XIIA) APRIL 2013 THE TAMILNADU DR.MGR MEDICAL UNIVERSITY, CHENNAI, TAMIL NADU. INTRODUCTION Tuberculosis of the skin is caused by mycobacterium tuberculosis, mycobacterium bovis. The inflammatory reactions of the host define the disease. Tuberculosis (TB) has been part of human history since prehistoric times. Nowadays there has been increasing incidence of cutaneous tuberculosis all over the world in the HIV/AIDS epidemic due to arise of resistant strains of mycobacterium...