A retrospective study on clinicopathological correlation of cutaneous tuberculosis

Rajkumar Kannan*, Lakshmanan Chellappan, Sridhar Venu, Muthusubramanian Chandrasekar

Department of Dermatology, Chengalpattu Medical College, Chengalpattu, Tamil Nadu, India

Received: 16 August 2018
Revised: 24 September 2018
Accepted: 26 September 2018

*Correspondence:
Dr. Rajkumar Kannan,
E-mail: rajderm0002@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Cutaneous tuberculosis is a curable chronic infectious disease. The clinical presentation and histopathological interpretation of skin biopsy may show variations as various types of the disease exist. The clinical diagnosis should be confirmed by histopathological features before starting treatment for particular type of the disease.

Methods: A retrospective hospital based study was conducted among patients in Chengalpattu medical college for last 3 years (May 2015 – April 2018) who had cutaneous tuberculosis. Skin biopsy taken from active lesion was stained with routine haematoxylin and eosin (H & E) stain.

Results: Out of 20 cases, male to female ratio was 1.5:1. The age of the patients ranged from 11-68 years. Clinically, lupus vulgaris was the most common type of cutaneous tuberculosis with 35% cases followed by tuberculosis verrucosa cutis 20% cases, scrofuloderma 15% and atypical mycobacterial infections 10%, and least common types are lichen scrofulosorum 5% which correlates with the previous study of Aruna et al. Characteristic tuberculoid granulomas were seen in 71.4% cases of lupus vulgaris, all cases of scrofuloderma, lichen scrofulosorum and 80% of tuberculosis verrucosa cutis. The clinical and histopathological correlation was seen in 17 cases (85%).

Conclusions: There can be overlap between different types of cutaneous tuberculosis with various other dermatological diseases, both clinically and morphologically and so correlation of clinical and histopathological features appears to be more useful for accurate diagnosis and typing of cutaneous tuberculosis. High clinical suspicion is necessary in cutaneous tuberculosis and early diagnosis and treatment are essential to prevent its complications.

Keywords: Koch’s bacillus, Acid-fast bacilli, Granuloma, CB-NAAT, Epitheloid cells

INTRODUCTION

Cutaneous tuberculosis (TB) is an important variant of extra pulmonary TB with varied clinical presentation determined by the route of infection as well as status of cellular immunity of the host. It has an incidence of around 5.9 cases per 1000 population. In India lupus vulgaris is the commonest type of secondary tuberculosis of skin in adults (approximate 74%).1-3 TB is one of the oldest known diseases. Robert Koch first discovered and isolated the tubercle bacillus in 1882 and two years later he identified it in lupus vulgaris beginning the description of various cutaneous aspects of TB.4 Cutaneous tuberculosis has become a rare event in developed countries. In the developing countries also, the incidence has fallen from 2 to 0.15%.5 and recently, it has fallen to 0.1%.6,7 The combination of better hygiene, immunizations, and anti tuberculous therapy (ATT) led to
a drop but the explosion of HIV/AIDS, the development of drug resistance due to inappropriate treatment and poor health care facilities can lead to renaissance of TB. Most of the cases of cutaneous TB can be diagnosed clinically but some cases really pose diagnostic challenges. Also in recent years, due to the increasing use of immune suppressants (corticosteroid and anticancer), biologicals and emergence of immune compromised host, it remains to be seen how the position of cutaneous tuberculosis is altered.

Our study is a keen effort to find out the incidence, clinical profile, and histopathological features of cutaneous tuberculosis atypical presentations if any and response to directly observed short course (DOTS) therapy.

**METHODS**

A retrospective hospital based study was conducted among patients in Chengalpattu medical college for last 3 years (May 2015 – April 2018) with clinically diagnosed Cutaneous Tuberculosis. The Tuberculin sensitivity test, sputum examination, FNAC (fine needle aspiration cytology), chest X-ray, ELISA, and skin biopsy were sampled by incision biopsy performed on the active advancing edge of the lesion under strict aseptic precautions. All the tissue samples were stained with haematoxylin and eosin (H & E) stain as well as Ziehl Neelsen stain. All the slides were examined under light microscope and analysis were carried out with respect to clinical features and histopathological findings to diagnose the type of cutaneous tuberculosis. Special investigations like culture, anti microbial sensitivity, CB-NAAT (Catridge– Based Nucleic Acid Amplification Test) were done when other results were inconclusive. Diagnosed cases were given ATT as per category for a period of 6 months for CAT I and 8 months for CAT II and response was assessed at 6 weeks and at the end of the therapy, adverse effects if any were also noted during the treatment period. Both descriptive and appropriated inferential statistical analysis test was done using SPSS version 16.

**Inclusion and exclusion criteria**

Patients of cutaneous tuberculosis confirmed either with Biopsy or any other relevant investigations and patients willing to give an informed consent were included. Patients who are already on treatment for other mycobacterial infections apart from mycobacterium tuberculosis and patients not willing to give a written consent were excluded.

**RESULTS**

Out of 20 cases, male to female ratio was 1.5:1. The age of the patients ranged from 11-68 years (Figure 1). Among the different age groups, the 10-25 years group (Table 1) was the most commonly affected group (n=7, 35%).

Clinically, lupus vulgaris (Figure 3 and 4) was the most common type of cutaneous tuberculosis (Table 1) with 35% cases followed by tuberculosis verrucosa cutis (Figure 5) with 20% cases, scrofuloderma (Figure 6) with 15% and atypical mycobacterial infections (Figure 8) 10% and least common types are lichen scrofulosorum.
(Figure 7) with 5%. We haven’t seen any cases of Erythema induratum of Bazin.

Figure 3: Showing lupus vulgaris before and after treatment photos along with histopathological findings in low power and high power showing tuberculoid granulomas in the upper dermis.

Figure 4: Showing psoriasiform lesion of lupus vulgaris with positive mantoux skin test.

Characteristic tuberculoid granulomas were seen in 71.4% cases of lupus vulgaris (Figure 4), all cases of scrofuloderma, lichen scrofulosorum and 80% of tuberculosis verrucosa cutis. The clinical and histopathological correlation was seen in 17 cases (85%). Most of the patients treated with Cat-1 and ATT got cured except in one papulo necrotic tuberculoid patient who had rifampicin resistance which was later diagnosed by CB-NAAT testing.

DISCUSSION

Cutaneous tuberculosis represents 1.5% of all cases of extra pulmonary tuberculosis.12

Figure 5: Showing tuberculosis verrucosa cutis.

Figure 6: Scrofuloderma in HIV positive patient.

Figure 7: Showing lichen scrofulosorum - morphology, cervical lymphadenopathy, strongly positive mantoux test and focal collection of lymphohistiocytic cellular infiltrates in dermis.

In our study the incidence of cutaneous tuberculosis in men is higher correlating to other Indian studies since
many of Indian men are involved in heavy manual outdoor works.\textsuperscript{5,9,13} The most common type of cutaneous tuberculosis in our study was lupus vulgaris (35\%) which was similar to some studies.\textsuperscript{10} However few other Indian studies found tuberculosis verruca cutis,\textsuperscript{11} as most common type and few others found scrofuloderma as the most common type.\textsuperscript{14} The most common site of involvement of lupus vulgaris in our study was the lower limb and the buttock similar to other studies.\textsuperscript{15} Mantoux test positivity was reported from 68\% to 100\% in various studies and our study compared well with their findings.\textsuperscript{16,17} Duration of ATT for cutaneous TB ranged from 6-12 months in different studies.\textsuperscript{18-20} We gave DOTS therapy according to recent RNTCP guidelines CAT–1 for 6 months. Most common disease associations found were diabetes mellitus (25\%) followed by hypertension (15\%), lipoma (5\%), chronic kidney disease (5\%).

In the early stages of evolution, tuberculosis and connective tissue disorder like SLE may mimic each other pretty much. In a tropical country like India which is set to be an abode of microbes, tuberculosis has to be ruled out prima facie by working out the case in depth to an extent of doing CB–NAAT (GeneXpert) before starting on immune suppressants. If the kind of vasculitic lesion is going to be erythema nodosum, ANA can be still false positive with increased ESR and CRP and could be misinterpreted as a case of SLE whereas the patient is really a case pulmonary Koch with false positive ANA. In such case patient may land up in miliary TB and so every attempt has to be taken to distinguish between evolving SLE and tuberculosis.

CONCLUSION

Cutaneous tuberculosis is an important public health issue in this part of the South India especially in lower socioeconomic group. If cutaneous tuberculosis is diagnosed, the patient must be completely evaluated for systemic involvement. Cutaneous tuberculosis should be suspected in every cases of chronic asymptomatic skin lesions which were resistant to conventional antibiotics. Clinical diagnosis of early lesions of tuberculosis is often difficult so correlation of clinical and histopathological features along with culture, CB-NAAT appears to be more useful for confirming the diagnosis of cutaneous TB. In doubtful cases, 5-6 weeks of therapeutic trial can be given. Second line drugs are to be considered in cases of failure/clinical resistance.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Prasad PVS, Padmavathy L, Prasanna Kumar, et al. Lupus vulgaris with verrucosa. Indian J Dermatol Venereal Leprol. 1994;60:347-8.
2. Rama Rao D, Lakshmi Kumari N, Ramona Murthy P. Multiple lesions of lupus vulgaris with unusual morphology. Indian J Dermatol Venereal Leprol. 1993;59:224-5.
3. Yates VM, Ormerod LP. Cutaneous tuberculosis in Blackburn district (U.K.): a 15 year prospective series. Br J Dermatol. 1997;136:483-9.
4. Robert Koch and Tuberculosis: Koch’s Famous Lecture. Nobel Foundation. 2008.
5. Gopinathan R, Pandit D, Joshi J, Jerajani H, Mathur M. Clinical and morphological variants of cutaneous tuberculosis and its relation to mycobacterium species. Indian J Med Microbiol. 2001;19:1936.
6. Kumar B, Rai R, Kaur I, Sahoo B, Muralidhar S, Radotra BD. Childhood cutaneous tuberculosis: a study over 25 years from northern India. Int J Dermatol. 2001;40:26-32.
7. Kumar B, Muralidhar S. Cutaneous tuberculosis: A Twenty-year prospective study. Int J Tuberc Lung Dis. 1999;3:494-500.
8. Darbyshire JH. Tuberculosis; Old reasons for a new increase. Br Med J 1995;310:954-5.
9. Patra AC, Gharami RC, Banerjee PK. A profile of cutaneous tuberculosis. Indian J Dermatol. 2006;51:105-7.
10. Aruna C, Senthil kumar AL, Sridevi K, Swapna K, Ramamurthy DVSB. A clinicoepidemiological study of cutaneous tuberculosis in a tertiary care teaching hospital in Andhra Pradesh, India. Int J Res Dermatol. 2017;3:88-93.
11. Dwari BC, Ghosh A, Paudel R, Kishore P. A clinicoepidemiological study of 50 cases of cutaneous tuberculosis in a tertiary care teaching hospital in Pokhara, Nepal. Indian J Dermatol. 2010;55:233-7.
12. Grosset JH. Present status of chemotherapy for tuberculosis. Rev Infect Dis. 1989;11:347-52.
13. Acharya KM, Ranpara H, Dutta R, Mehta B. A clinicoepidemiological study of 50 cases of cutaneous tuberculosis in Jamnagar district. Indian J Dermatol Venereol Leprol. 1997;63:301-3.
14. Thakur BK, Verma S, Hazarika D. A clinicoepidemiological study of cutaneous tuberculosis at Dibrugarh district, Assam. Indian J Dermatol. 2012;57:63-5.
15. Walker SL, Lozewicz S, Sood R, Mann TA, Campalani E, Hubbard VG. Lupus vulgaris due to mycobacterium bovis bacillus calmette guerin at the previous BCG vaccination. Clin Exp Dermatol. 2008;34:213-5.
16. Starke JR. Bacille Calmette _guerin vaccine. Semin Pediatr Infect Dis. 1991;2:153-8.
17. Bannon MJ. BCG and tuberculosis. Arch Dis child 1999:80;80-3.
18. Dwari BC, Ghosh A, Paudel R, Kishore P. A clinicoepidemiological study of 50 cases of cutaneous tuberculosis in a tertiary care teaching hospital in Pokhara, Nepal. Indian J Dermatol. 2010;55:233-7.
19. Raghu Rama Rao G, Sridevi, Lakshmy Narayan B, Amareswar A, Sandhya S. Directly observed treatment short course and cutaneous tuberculosis: Our experience. Indian J Dermatol Venereol Leprol. 2011;77:330-2.
20. Ramesh V, Sen MK, Sethuraman G, D'Souza P. Cutaneous tuberculosis due to multidrug-resistant tubercle bacilli and difficulties in clinical diagnosis. Indian J Dermatol Venereol Leprol. 2015;81:380-4.
21. Ramam M, Tejasvi T, Manchanda Y, Sharma S, Mittal R. What is the appropriate duration of a therapeutic trial in cutaneous tuberculosis? Further observations. Indian J Dermatol Venereol Leprol. 2007;73:243-6.

Cite this article as: Kannan R, Chellappan L, Venu S, Chandrasekar M. A retrospective study on clinico pathological correlation of cutaneous tuberculosis. Int J Res Dermatol 2018;4:595-9.