

## PATTERN OF CUTANEOUS TUBERCULOSIS IN NORTH INDIA

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Data on 66 patients with cutaneous tuberculosis seen over a period of 4 years was analysed. Males predominated (71.6%) over females (28.4%). More than one fifth patients were below the age of 10 years. Lupus vulgaris was the commonest type of disease pattern seen in 81.8%, followed by scrofuloderma in 21.2%. Warty tuberculosis was the least common of all. Tuberculids seen were erythema nodosum in 3, papulo-necrotic in 2, and lichen scrofulosorum in one. Face was involved most often (34.8%), followed by legs, buttocks, arms and neck. The number of lesions varied from 2-7 in a quarter of patients. Organs other than skin were involved in 25.8% patients. Pulmonary involvement was the commonest followed by bone, CNS and lymph node involvement. Almost half the patients were unvaccinated as were the BCG vaccinated patients. Mantoux test was negative in 27.2% patients. Characteristic tubercular histopathology was seen in 81.8% and in the rest it was non-specific.

**Key words :** Cutaneous tuberculosis, Lupus vulgaris, Scrofuloderma, Tuberculids, Warty tuberculosis, Erythema nodosum.

The incidence of cutaneous tuberculosis is declining in most parts of the world on account of the availability of effective anti-tubercular drugs, elimination of infected milk herds and general improvement in the living standards. However, cutaneous tuberculosis is not uncommon in India.

After Laennec's earliest description of his own *Prosector's wart* in 1826,<sup>1</sup> cutaneous tuberculosis has been described to present in an astonishing variety of clinical expressions. The etiology of all forms of cutaneous tuberculosis is *Mycobacterium tuberculosis* of human, bovine and very rarely the avian type.<sup>2</sup>

It is our impression that certain aspects of the disease as seen in India differ from those reported in the western literature. This report embodies the data obtained from some patients having cutaneous tuberculosis seen and investigated during the past few years.

**Results**

Sixty six patients were diagnosed to be suffering from cutaneous tuberculosis during the

period extending from January 1980 to December 1983. During the same period, 39074 dermatological patients were seen, giving an incidence of 0.17% for cutaneous tuberculosis.

The age range varied from 2½ to 75 years. There were 43 (71.6%) males and 23 (28.4%) females (M : F 1.9 : 1). Among the general dermatological patients, the male to female ratio was M : F 1.5 : 1. Distribution pattern of the disease according to the age and sex is given in table I. In 14 (21.2%) patients the

**Table I.** The type of disease according to age and sex.

Age in years	Males	Females	Lupus vulgaris	Tuber-culosis verrucosa cutis	Scrofuloderma
0—10	7	7	7	0	9
11—20	11	2	12	2	2
21—30	10	3	11	1	1
31—40	8	4	11	2	1
Above 40	7	7	13	1	1

Many patients had more than one type of lesion. disease had appeared before the age of 10, while in 27 (40.9%) the onset was before 20 years of age. The duration of disease varied from 3 months to 14 years. Lupus vulgaris was

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encountered in 54 (81.8%) cases, scrofuloderma in 14 (21.2%) cases and tuberculosis verrucosa cutis (wartlike tuberculosis) in 6 (9.1%) cases. Papulo-necrotic tuberculid was seen in 2 patients, the lesions were present over the arms, legs and penis in one, while the other patient had them on the penis only. Three patients had crythema nodosum, and one child with scrofuloderma had lichen scrofulosorum. Scrofuloderma was the commonest lesion in the younger age groups. Wartlike tuberculosis was not seen below 10 years of age. The incidence of lupus vulgaris rose with the age, after the age of 10 years it dominated the presentation in all age groups.

Face (including the lips and nose) was the commonest site in 23 (34.8%) patients, legs in 13 (19.7%), buttocks and arms in 10 (15.1%) each, neck in 7 (10.6%), feet and trunk in 6 (9.1%) each and hands in 5 (7.6%) patients (Table II). In 16 (24.2%) patients, the number

Organ system involvement other than the skin was seen in 17 (25.8%) patients. Concomitant pulmonary tuberculosis was present in 6 (35.3%), 5 (29.4%) patients had bone disease, 2 (11.8%) patients had central nervous system involvement, one patient had tubercular meningitis, tuberculoma in the medulla was diagnosed at autopsy in the second patient. Lymph node involvement and involvement of abdomen was seen in 2 (11.8%) patients each. One patient had developed elephantiasis of the leg due to long-standing disease.

Successful BCG vaccination had been done in 30(45.4%) patients, whereas 36 patients (54.6%) had not been vaccinated. The differences were statistically not significant. Tuberculin test was positive (>12 mm induration) in 48 (72.7%) and negative in 18(27.2%) patients.

Morphology did not follow the classical description in every case, some big lesions showed features of both lupus vulgaris at one and of wartlike tuberculosis at the other end. Borders of some lesions of scrofuloderma had features of lupus vulgaris. Characteristic histopathologic features of lupus vulgaris, wartlike tuberculosis or scrofuloderma were present in 54 (81.8%), whereas in 12 (18.2%) patients the pathology was non-specific. In patients with histopathology labelled as non-specific, classical tuberculoid granuloma with giant cells was not present. However, by exclusion, the degree and type of infiltrate was considered compatible with the diagnosis of tuberculosis of the skin.

#### Comments

The statement that cutaneous tuberculosis is rare in tropical countries is not entirely true.<sup>3,4</sup> Western authors are probably not fully aware of the incidence of tuberculosis in India<sup>5</sup> and other tropical countries like Hongkong<sup>6</sup> and China<sup>7</sup> because of the rarity of the disease in their own areas. Calciferol and UVR<sup>8</sup> and local excision and monotherapy with INH<sup>9</sup> have been recommended as treatment of cutaneous tuberculosis.

**Table II.** Site of first lesion according to age.

Site	Number of patients in the age group					Total	%age
	0-10	11-20	21-30	31-40	Above 40		
Face (nose, lip, cheek)	3	5	2	8	5	23	34.8
Legs	3	1	3	2	4	13	19.7
Buttocks	1	3	4	1	1	10	15.1
Arms	1	5	1	1	2	10	15.1
Neck	5	1	0	0	1	7	10.6
Foot	0	1	3	0	2	6	9.1
Trunk	3	1	0	2	0	6	9.1
Hand	2	0	0	2	1	5	7.6

Some patients had onset of lesions at more than one site simultaneously.

of lesions varied from 2 to 7, while majority had a single lesion. One patient had tuberculous dactylitis (of soft tissue only) of two fingers without any underlying bone involvement.

Lupus vulgaris and warty tuberculosis are considered inoculation tuberculosis occurring in persons who have already had a previous contact with tubercle bacillus. In poor socio-economic environmental conditions, children may become infected accidentally by playing or sitting on the ground contaminated by tuberculous sputum or other discharges.<sup>5,6</sup>

In India, the incidence of cutaneous tuberculosis reported among skin patients varied from 0.24%, 0.5%, 0.59% and 0.28% respectively from south,<sup>10</sup> east,<sup>11-12</sup> central India<sup>1</sup> and north.<sup>14</sup>

Lupus vulgaris was the commonest type of cutaneous tuberculosis in the present Study, as also in other studies from India and abroad.<sup>2,5,7,10-13,15,16</sup> However, in a large study from Hongkong,<sup>6</sup> the incidence of lupus vulgaris was next to that of warty tuberculosis.

The prevalence in children and women has been over emphasized.<sup>2,5,6,17</sup> In the present study, adult males were most frequently affected. However, the sexes were equally involved over the age of forty. Pandhi et al<sup>14</sup> reported male preponderance in patients below 30 years of age. Panja and Ghosh<sup>13</sup> found both sexes equally affected.

The exposed areas of the body have been reported to be more often involved by cutaneous tuberculosis.<sup>3,5</sup> In the present series, face and other exposed areas were frequently (56.0%) involved. No site was found to be immune or specific for any particular clinical variety. Warty tuberculosis was the least common type of tuberculosis (9.1%), and this compares well with the findings of other authors.<sup>5,7,10,20,21</sup> No site was spared though exposed areas were most often involved, this variety was not seen in children below 10 years of age. More than half of the patients of Mitchell<sup>22</sup> and Wong et al<sup>6</sup> were however, below 10 years of age. The usual number of lesions of lupus vulgaris and warty tuberculosis is believed to be one or a few, while in the present series 24.2% patients had

multiple lesions and one patient had seven lesions. Singh<sup>5</sup> thought that many distant lesions in his patients were the result of lymphatic spread. None of our patients had lupus vulgaris on the vaccination site, as reported<sup>2</sup> earlier.

Fourteen (21.2%) patients in the series were children below 10 years of age. Manchanda<sup>23</sup> and Raj Narain<sup>24</sup> showed 40% of the child population in India below 1 year and 25% below 6 years to be infected with tubercle bacilli as evidenced by tuberculin positivity, it is not surprising that many children are not able to effectively deal with the acquired tubercle bacilli and subsequently develop cutaneous tuberculosis.

Tuberculids were seen in 6(0.1%) patients in the present series. The reported incidence has varied from negligible<sup>5,10</sup> to 14.9%<sup>7</sup> and 41.7%.<sup>21</sup>

Carcinomatous change as reported in lupus vulgaris,<sup>18</sup> was not recorded in the present series.

Dactylitis as seen in two of our patients with a histopathology suggestive of lupus vulgaris and without bone involvement is rare.<sup>19</sup>

Scrofuloderma was found next in frequency to lupus vulgaris in the present series (21.2%). The finding is in agreement with the observations of Satyanarayan<sup>10</sup> from India and Terekhova<sup>15</sup> from Russia, but in contrast to the findings of Singh,<sup>5</sup> Ki<sup>7</sup> and Wong et al<sup>6</sup> who had a very low incidence of scrofuloderma in their series. In another study from India,<sup>14</sup> scrofuloderma constituted 44.0% of the patients. In Mexico,<sup>20</sup> the incidence of scrofuloderma was the highest as compared to other forms of cutaneous tuberculosis. It was reported to be commonest in children below 10 years of age,<sup>2</sup> 13.9% of scrofuloderma patients were below 10 years of age in the present series. Almost all types of id eruptions were recorded, erythema nodosum being the commonest. Penile occurrence of papulo-necrotic tuberculids is unusual,<sup>8</sup> there were two patients in the present series. Lichen scrofulosorum is the rarest of all ids. Ids are

thought to be associated with bone or lymph node tuberculosis and a strongly positive Mantoux test.<sup>19</sup>

BCG vaccination has recently been reported to lack protection against any form of systemic tuberculosis.<sup>25</sup> The protective role of BCG in children has also not been upheld.<sup>26</sup> Among our patients 45.4% were vaccinated as against 54.6% non-vaccinated, the ratio holds true for the general population also. Romanus<sup>27</sup> however, recorded a four-fold increase in the incidence of tuberculosis in the unvaccinated population.

Mantoux test was surprisingly negative in 27.7% patients with active disease. Recent studies indicate that loss of hypersensitivity may not be restricted to overwhelming pulmonary tuberculosis only.<sup>28</sup> Behl et al<sup>29</sup> recently found tuberculin positivity in 26.5% of 363 children patients only. In the present study no correlation was found in the positivity rate, any particular type of cutaneous tuberculosis, extent of the disease or previous BCG vaccination.

Beyt et al<sup>9</sup> found typical tubercular histopathology only in 8 out of 31 patients diagnosed clinically, the features in others were non-specific. Classical tubercle formation was found in 54 (81.8%) cases in the present series. In the remaining 12 (18.2%) patients with non-specific histopathology, weightage was given to the clinical features and therapeutic response.

The frequency with which cutaneous tuberculosis is associated with clinically active tuberculosis in other organs has been reported to vary from 9%,<sup>5,6</sup> 16%,<sup>30</sup> 10-20%,<sup>31,32</sup> 21%<sup>7</sup> and 45%.<sup>9,11</sup> In our study 17 (25.8%) patients had evidence of tuberculosis elsewhere, i.e. lungs, bones, CNS, lymph nodes and abdomen. The morbidity of lupus vulgaris patients from pulmonary tuberculosis is four to ten times higher than in the general population and in majority of cases the pulmonary disease represents post primary tuberculosis.<sup>33,34</sup> Lupus vulgaris may indicate tuberculous disease somewhere else

having a serious course.<sup>32,35</sup> From the high incidence of associated systemic tuberculosis seen in the present group of patients and other studies, the importance of screening the patient for evidence of tuberculosis elsewhere and the need for a full antitubercular therapy becomes imperative.

## References

1. Marmizet WL : Laennec and the prosector's wart, Arch Dermatol, 1962; 86 : 74-76.
2. Christiansen JV : Lupus vulgaris gigantea caused by *Mycobacterium avium*, in : Proceedings of the 13th International Congress of Dermatology, Vol II, Editors, Jaddasohon W and Schirren CG : Springer Verlag; New York, 1968; pp 1319-1320.
3. Fasal P and Rhodes B : Cutaneous tuberculosis and sarcoidosis in the American negro and inhabitants of tropical countries, in : Hand Book of Tropical Dermatology and Medical Mycology, Editor, Simons RG : Vol I, Elsevier Pub Co, Amsterdam, 1952; 578-603.
4. Zoon JJ : Tuberculosis of the skin. Consideration about pathogenesis, Arch Dermatol, 1957; 75 : 161-170.
5. Singh G : Lupus vulgaris in India, Ind J Dermatol Venereol, 1974; 40 : 257-260.
6. Wong KD, Lee KP and Chiu SF : Tuberculosis of the skin in Hong Kong (A review of 160 cases). Brit J Dermatol, 1968; 80 : 424-429.
7. Li Hung-ching : A preliminary study of tuberculosis of skin in Peking, Chinese J Dermatol, 1957; 5 : 13.
8. Gonzalez OA : Tuberculosis of the skin in the tropics, in : Tropical Bacterial Dermatoses, II in : Clinical Tropical Dermatology, Editor, Canizares O : Blackwell Scientific Publication, London, 1975; pp 134-152.
9. Beyt BE, Orbals DW, Santa Cruz OJ et al : Cutaneous mycobacteriosis : analysis of 34 cases with a new classification of the disease, Medicine, 1980; 60 : 95-109.
10. Satyanarayan BV : Tuberculoderma. A brief review together with statistical analysis and observations, Ind J Dermatol Venereol, 1963; 29 : 25-42.
11. Banerjee BN : Common clinical manifestations of tuberculosis of skin in tropics, Ind J Dermatol, 1956; 1 : 11-14.

12. Banerjee BN : Tuberculosis of the skin and its relation with pulmonary tuberculosis, *Ind J Dermatol*, 1957; 2 : 69-72.
  13. Panja SK and Ghosh R : Cutaneous tuberculosis in children, *Bull Inst Post Grad Med Ed Res, Cal*, 1979; 21 : 55.
  14. Pandhi RK, Bedi TR, Kanwar AJ et al : Cutaneous tuberculosis—clinical and investigative study, *Ind J Dermatol*, 1977; 22 : 99-117.
  15. Terekhova NY : Histopathological changes in skin tuberculosis under treatment with phthivazid, *problemy Tubark* 40 : 67. Abstract in *Excerpta Medica*, 1963; 17 : 417.
  16. Neves H : Incidence of skin diseases 1952-65, *Trans St John's Hosp Dermatol Soc, London*, 1966; 52 : 255.
  17. Marcopoulos A, Laskaris G and Dricos G : Secondary tuberculous ulcerations, *Hiatrica Chronica*, 1970; 10 : 523-530.
  18. Forstrom L : Carcinomatous changes in lupus vulgaris, *Ann Clin Res*, 1969; 1 : 213-219.
  19. Graham Brown RAC and Sarkany I : Lichen scrofulosorum with tuberculous dactylitis, *Brit J Dermatol*, 1980; 103 : 561-564.
  20. Amezquita R : Tuberculosis cutanea, *Aspectos clinicos epidemiologicos en Mexico*. Thesis. *Acta Leprol*, Vol 16, Abstract in *Excerpta Medica*, 1965; 19 : 674.
  21. De Noronha T and De Almida Goncalves JCO : Tratamento de Tuverculosa cutanea, *Arch Patol*, 33 : 20 Abstracted in *Excerpta Medica*, 1961; 16 : 254.
  22. Mitchell PG : Tuberculosis verrucosa cutis among Chinese in Hong Kong, *Brit J Dermatol*, 1954; 66 : 444-448.
  23. Manchanda SS : Tuberculosis in children below the age of 3 years, *Ind J Child Health*, 1962; 11 : 8-19.
  24. Raj Narain, Gaser A, Jambunathan MV et al : Tuberculosis prevalence survey in Tumkur District, *Ind J Tuber*, 1963; 10 : 85-116.
  25. World Health Organisation : BCG vaccination policies, Technical Report Series No, 652 : WHO, Geneva, 1980.
  26. Tuberculosis Prevention Trial. Trial of BCG vaccines in south India for tuberculosis prevention: First report, *Bull WHO*, 1979; 57 : 819-827.
  27. Romanov V : Childhood tuberculosis in Sweden. An epidemiological study made six years after cessation of general BCG vaccination of the newborn, *Tubercle*, 1983; 64 : 101-110.
  28. Youngmans GP : Tuberculosis, WB Saunders, Philadelphia, 1979; pp 209.
  29. Behl L, Dattal MS, Parmar V et al : A study of tuberculosis in children in and around Simla Hills, *J Ind Med Assoc*, 1984; 82 : 44-47.
  30. Strauss H : Katamnestiche untersuchungen von fallen mit Tuberkulid, *Arch Dermatol Syphilol*, 1954; 98 : 417-434.
  31. Horwitz O : The localisation of lupus vulgaris of the skin, *Acta Tuberc Pneumol Scand (Suppl)*, 1959; 47 : 175-181.
  32. Horwitz O and Christensen S : Numerical estimates of the extent of the lesion in lupus and their significance for epidemiologic and clinical research, *Amer Rev Resp Dis*, 1960; 82 : 862-872.
  33. Clasen K and Horwitz O : The morbidity from pulmonary tuberculosis in patients suffering from extra-pulmonary tuberculosis disease, lupus vulgaris cutis, *Adv Tuber Res*, 1960; 10 : 237-255.
  34. Wilkinson DS : Tuberculosis of the skin, in : *Text Book of Dermatology*, Third edition, Vol I, Editors, Rook A, Wilkinson DS and Ebling FJG : Blackwell Scientific Publication, London, 1982; pp 677.
  35. Harahap M : Tuberculosis of skin, *Intern J Dermatol*, 1983; 22 : 542-545.
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