**INTRODUCTION**

The granulomatous reaction pattern is defined as a distinctive inflammatory pattern characterized by the granulomas.[1] It is difficult to present a completely satisfactory classification of granulomatous reaction.[2] Granulomatous lesions of skin and subcutaneous tissue are known as “Dermal Granulomas,” which are of four types; immunogenic, infectious, foreign body, and granulomas associated with tissue injury.[3] Skin biopsies and microscopic study with routine hematoxylin and eosin as well as by special stains are must to identify the type and etiologic agent of the granuloma. In present study, following types of dermal granulomas were included–leprosy, cutaneous tuberculosis, syphilis, fungal, actinomycosis, foreign body granuloma, granuloma annulare, and sarcoidosis.

**MATERIALS AND METHODS**

A total of 90 cases of clinically diagnosed and suspected dermal granulomas were studied. The specimens were collected from patients attending outdoor patient department of skin and venereal disease. Complete history of the patient was taken including type and site of lesion, duration...
of illness, physical examination, family history, and previous investigations.

Specimens were collected from suspected site after cleaning the lesion with spirit. For histopathological diagnosis, all skin biopsies were taken by punch measuring 3–4 mm in diameter after injecting 1% lignocaine. In all specimens, subcutaneous fat were taken to see the extent of disease.

All punch biopsies were fixed in 10% formalin for 24 h. After processing, all slides were stained by hematoxylin and eosin stain (Harris hematoxylin). Few special stains were also used for confirmation of the particular diagnosis such as Fite–Faraco, Ziehl–Neelsen, and periodic acid–Schiff stains.

**OBSERVATION AND DISCUSSION**

Total 90 cases were clinically diagnosed as various types of dermal granulomas, of which 10 cases were diagnosed histologically as non-granulomatous lesions. Thus, the actual study number of histologically proved cases of dermal granulomas was 80 of the total 90 cases.

In present study of 80 cases of dermal granulomas, 50% cases were of leprosy, 30% of cutaneous tuberculosis, 6.25% of syphilis, followed by others [Table 1]. Incidence of leprosy was highest among all cases in spite of the various leprosy eradication programs that are being enforced in our country.

Dermal granulomas were most common in the middle age between 21 and 40 years of age (73.75%) [Table 2]. A similar study by Naved Uz Zafar et al.,[4] showed that dermal granulomas were common in 11–20 years of age. Maximum cases of leprosy were reported between 31 and 40 years (55%) of age[Table 3]. Productive population of the community most commonly affected in our study, which was contrary to that reported in Junaid et al.,[5] showed maximum cases of leprosy to be between 41 and 60 years of age.

Out of 80 cases of dermal granulomas, 50 were males (62.50%) and 30 were females (37.5%) [Table 4]. These results were compared to that reported by Dhar,[6] in which males (54.55%) were slightly more affected than females (45.46%).

As the lepromatous leprosy [Figures 1 and 2] has the highest infectivity, highest incidence of lepromatous leprosy (57.5%) was noted among all cases of leprosy, followed by tuberculoid leprosy (27.5%). All 6 cases of borderline leprosy were off borderline lepromatous leprosy type [Table 5]. But in Tiwari and Tutakne’s study,[7] maximum cases were of tuberculoid leprosy as they had carried out their study in Indian Armed Forces, where regular medical examination at unit level of all soldiers greatly helped in early detection of leprosy cases.

Incidence of lupus vulgaris (45.83%) [Figures 3 and 4] was the highest among all cases of cutaneous tuberculosis, followed by tuberculosis verrucosa cutis (33.34%). These results were compared with that by Naved Uz Zafar et al.,[4] which also showed the highest incidence of lupus vulgaris (38.3%) followed by tuberculosis verrucosa cutis (19.1%) [Table 6]. Similar to leprosy, cases of cutaneous tuberculosis were also reported between the age group of 21–30 years (54.17%), which is the productive age group of the community [Table 7].

All diagnosed cases of syphilis were of secondary syphilis. As nowadays syphilis is diagnosed clinically and confirmed by serological test like Venereal Disease Research Laboratory (VDRL) and Treponema Pallidum Hemagglutination (TPHA), very few cases were biopsied. As syphilis is a sexually transmitted disease, mostly young to adult population were affected. Our study showed that all incidences occurred between 11 and 30 years and these results were compared with that by Anandam[8] [Table 8].

All 3 cases of fungal granulomas [Figures 5 and 6] were of mycetoma foot. All patients were reported between the age group of 21–35 years. Both the cases of foreign body

| Table 1: Incidence of various types of dermal granuloma. |
|---------------------------------|--------|-----------------|
| Types of dermal granuloma      | Cases  | Percentage (%)  |
| Leprosy                         | 40     | 50              |
| Cutaneous tuberculosis          | 24     | 30              |
| Syphilis                        | 5      | 6.25            |
| Fungal                          | 3      | 3.8             |
| Foreign body                    | 2      | 2.5             |
| Actinomycosis                   | 2      | 2.5             |
| Granuloma annulare              | 3      | 3.75            |
| Sarcoidosis                     | 1      | 1.2             |
| Total                           | 80     | 100             |

| Table 2: Comparative study of age incidence of dermal granuloma. |
|-----------------|-----------------|-----------------|
| Age in years    | Present study   | Naved Uz Zafar et al.[4] |
|                 | Cases           | Percentage (%)   | Cases           | Percentage (%)   |
| 1–10            | 4               | 5                | 3               | 2.4              |
| 11–20           | 7               | 8.75             | 47              | 38.2             |
| 21–30           | 30              | 37.5             | 26              | 21.1             |
| 31–40           | 29              | 36.25            | 17              | 13.8             |
| 41–50           | 10              | 12.5             | 13              | 10.6             |
| 50–60           | –               | –                | 11              | 8.9              |
| >60             | –               | –                | 6               | 4.8              |
| Total           | 80              | 100              | 123             | 100              |
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Table 3: Comparative study of age incidence in leprosy.

| Age in years | Present study | Junaid et al. [3] |
|--------------|---------------|-------------------|
|              | Cases | Percentage (%) | Cases | Percentage (%) |
| 1–20         | 4     | 10             | 3     | 3              |
| 20–40        | 28    | 70             | 28    | 28             |
| 41–60        | 54    | 20             | 54    | 54             |
| >60          | –     | –              | 15    | 15             |
| Total        | 40    | 100            | 100   | 100            |

Table 4: Comparative study of sex predilection in dermal granuloma.

| Gender   | Present study | Dhar [6] |
|----------|---------------|----------|
|          | Cases | Percentage (%) | Cases | Percentage (%) |
| Male     | 50    | 62.50         | 12    | 54.55          |
| Female   | 30    | 37.50         | 10    | 45.46          |
| Total    | 80    | 100           | 22    | 100            |

Table 5: Comparative study of incidence of various types of leprosy.

| Types of leprosy       | Present study | Tiwari and Tutakne [7] |
|------------------------|---------------|------------------------|
|                        | Cases | Percentage (%) | Cases | Percentage (%) |
| Lepromatous leprosy    | 23    | 57.5           | 498   | 26.06          |
| Borderline leprosy     | 6     | 15             | 223   | 11.67          |
| Tuberculoid leprosy    | 11    | 27.5           | 1023  | 53.53          |
| Indeterminate leprosy  | –     | –              | 167   | 8.74           |
| Total                  | 40    | 100            | 1911  | 100            |

Table 6: Comparative study of incidence of cutaneous tuberculosis.

| Types of tuberculosis | Present study | Naved Uz Zafar et al. [4] |
|-----------------------|---------------|----------------------------|
|                       | Cases | Percentage (%) | Cases | Percentage (%) |
| Tuberculosis verrucosa cutis | 8    | 33.34          | 9     | 19.1           |
| Lupus vulgaris         | 11    | 45.83          | 18    | 38.3           |
| Tuberculosis cutis orificialis | –    | –              | 7     | 14.9           |
| Tuberculous gumma      | –     | –              | 6     | 12.8           |
| Scrofuloderma          | 3     | 12.5           | 7     | 14.9           |
| Primary tuberculosis   | 2     | 8.33           | –     | –              |
| Total                  | 24    | 100            | 47    | 100            |

Table 7: Age incidence in cutaneous tuberculosis.

| Age in years | Cases | Percentage (%) |
|--------------|-------|----------------|
| 1–10         | 4     | 16.67          |
| 11–20        | 3     | 12.5           |
| 21–30        | 13    | 54.17          |
| 31–40        | 2     | 8.33           |
| 41–50        | 2     | 8.33           |
| Total        | 24    | 100            |

Table 8: Comparative study of age incidence in secondary syphilis.

| Age in years | Present study | Anandam [8] |
|--------------|---------------|-------------|
|              | Cases | Percentage (%) | Cases | Percentage (%) |
| 1–10         | –     | –              | 3     | 0.5           |
| 11–20        | 1     | 20             | 196   | 28.4          |
| 21–30        | 4     | 80             | 329   | 47.7          |
| 31–40        | –     | –              | 124   | 17.9          |
| 41–50        | –     | –              | 38    | 5.5           |
| Total        | 5     | 100            | 690   | 100           |

Figure 1: 10 × showing globi of lepra bacilli with fite faraco stain – Lepromatous leprosy.

granuloma were females. Cases were reported between the age group of 21 and 50 years. Catgut and Sebum were the foreign material that had initiated formation of foreign body granuloma. Both cases of actinomycosis were young male with the lesions over their jaw. Total 3 patients were presented with lesions of granuloma annular. One 38-year-old male patient was presented with sarcoïd granuloma, which was diagnosed by exclusion of all other possibilities of epithelioid cell granulomas and with clinical correlation.
CONCLUSION

In our study, most common dermal granulomatous disease was leprosy, followed by cutaneous tuberculosis. Histopathology played an important role in the final diagnosis of dermal granulomatous lesions. Dermal granulomatous lesions have varied clinical picture and are often difficult to classify. It is also impossible to treat the patients without histopathological confirmation of the diagnosis.

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Conflict of Interest
There are no conflicts of interest.

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