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Original Article

Correlation of clinical and histopathological classification of Leprosy in post elimination era

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Clinical and histopathological correlative study was carried out in 171 cases of leprosy using the criteria laid down by Ridley and Jopling. There was male preponderance in the study with majority of patients (35.7%) in the age goup of 21-30 years. The overall concordance between the clinical and histopathological diagnosis was 57.3%. Maximum concordance was seen in the polar ends of the spectrum with 76.9% in LL and 75.0% in TT. The concordance rate was lower in the borderline groups with 57.3% in BT, 40.0% in BL and least concordance of 16.7% in BB. However the concordance for IL was higher than the borderline groups with 66.7%. Cases in borderline group are in continuously changing immunological spectrum. Histological classification because of its definitive features gives a better indication than clinical classification for any recent shift of a case in the spectrum. Therefore skin biopsy should be done in all cases for correct classification of leprosy.

Keywords : Leprosy, Ridley Jopling classification, Histopathology.

Introduction

Leprosy is an infectious disease primarily affecting the skin and nerves. The histopathological findings in leprosy are related to the immunological status of the patient (Bhatia et al 1993). Ridley and Jopling (1966) proposed a five group histological classification reflecting the immunological spectrum and this classification has been widely accepted by histopathologists. Clinicians have also adopted the same nomenclature for classifying leprosy on clinical grounds. Subsequently number of studies have attempted to correlate this histological classification with the clinical nomenclature.

In the present study we make an attempt to correlate between the clinical and histopathological classifications of leprosy in the post elimination era and compare the results with various studies carried out in the pre elimination period.

Material & Methods

The present study was carried out at the department of Pathology, JJM Medical College Davangere, Karnataka, India. This institution is a

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tertiary care teaching hospital catering to a large population of Central Karnataka. One hundred and seventy one (171) newly diagnosed consecutive cases of leprosy which underwent skin biopsy for histopathological examination during the period January 2010 to July 2011 were included in the study. Leprosy cases presenting with clinical manifestations or histopathological changes suggestive of lepra reactions were excluded from the study. The criteria of Ridley and Jopling were utilized to diagnose and classify the cases clinically and histopathologically. All the biopsies were fixed in 10% formalin, processed and sectioned. All sections were stained with hematoxylin and eosin. Fite Faraco stain to demonstrate acid fast bacilli was used wherever required. Agreement between the clinical and histopathological classification was calculated using percentage of parity.

Results

A total of 171 cases of leprosy were included in the present study out of which 110(64.3%) were males and 61(35.7%) were females. The age of the patients ranged from 5 years to 80 years. Majority of the patients i.e. 61(35.7%) were in the age group of 21 to 30 years.

The distribution of these cases based on Ridley and Jopling clinical and histopathological classification is shown in table 1.

Table 1 : Clinical & histopathological spectrum of leprosy cases using Ridley Jopling classification

Clinical type	Number	Percentage	Histopathologic type	Number	Percentage
TT	16	9.3	TT	22	12.8
BT	82	47.9	BT	65	38.0
BB	06	3.5	BB	28	16.4
BL	35	20.5	BL	18	10.5
LL	26	15.2	LL	27	15.7
IL	06	3.5	IL	11	6.4
Total	171	100	Total	171	100

Table 2 : Correlation of clinical & histopathological classification in leprosy cases

Clinical type	Clinically diagnosed cases	Histopathological breakup among clinically diagnosed cases						Percentage of parity
		TT	BT	BB	BL	LL	IL	
TT	16	12	02	-	-	-	02	75.0
BT	82	09	47	19	01	01	05	57.3
BB	06	-	05	01	-	-	-	16.7
BL	35	-	09	06	14	06	-	40.0
LL	26	-	01	02	03	20	-	76.9
IL	06	01	01	-	-	-	04	66.7
Total cases	171	22	65	28	18	27	11	57.3

Table 3 : Summary of histopathological findings in leprosy cases in the present study.

Histopathological type	TT	BT	BB	BL	LL	IL
Number of cases	22	65	28	18	27	11
Epidermal atrophy	02	22	24	18	27	03
Clear subepidermal zone	00	03	22	18	27	00
Compact epithelioid cell granulomas	22	32	17	00	00	00
Lymphocytes	22	65	28	18	04	11
Foamy histiocytes	00	00	28	18	27	00
Giant cells	15	31	00	00	00	00
Loose histiocytic aggregates	08	65	28	18	00	05

It is clearly evident from table 1 that clinically majority of the patients (47.9%) belonged to borderline tuberculoid (BT) group, followed by borderline lepromatous (BL) group (20.5%), lepromatous leprosy (LL) group (15.2%), tuberculoid leprosy (TT) group (9.3%) and midborderline (BB) group and indeterminate leprosy (IL) group with 3.5% each. Histopathologically majority of the cases (38.0%) belonged to BT, followed by BB (16.4%), LL (15.7%), TT (12.8%), BL (10.5%) and IL (6.4%).

The correlation between clinical and histopathological classification is shown in table 2.

The overall concordance between the clinical and histopathological classification was 57.3%. Maximum concordance was seen in the polar ends of the spectrum with 76.9% in LL and 75.0% in TT. The concordance rate was lower in the borderline groups with 57.3% in BT, 40.0% in BL and least concordance of 16.7% in BB. However the concordance for IL was higher than the borderline groups with 66.7%.

Histopathological analysis of the cases in the present study as shown in table 3 was carried out with due attention to the epidermal atrophy, presence of clear sub epidermal zone, dermal inflammatory infiltrate, presence and composition of granulomas , presence of giant cells and relative proportion of lymphocytes and foamy histiocytes in accordance with Ridley and Jopling histopathological criteria.

Discussion

A disease like leprosy needs an accurate classification because of its varied manifestations. The most commonly accepted classification by research workers is that of Ridley and Jopling, which is primarily based on immunity but has been correlated with clinical, histopathological and bacteriological findings. Despite having such an accurate classification, leprosy cases show so many diversities between the clinical and histopathological features. Clinical spectrum of leprosy cases in the present study revealed maximum cases (71.9%) in borderline group (BT+BB+BL), followed by LL (15.2%), TT (9.3%) and least in IL group (3.5%). Similar predominance of cases in borderline group was also observed by Shenoi and Sidappa (1988), Nadkarni and Rege (1999), Moorthy et al (2001) and Sharma et al (2008).

In the present study the histopathological diagnoses were consistent with the clinical diagnoses in 98 out of 171 (57.3%) cases as shown in table 2. The percentage of parity between the clinical and histopathological classification was highest at the polar ends of the spectrum i.e. TT

and LL as shown in table 4. Similar results were obtained by Sehgal et al (1977, 1980), Nadkarni and Rege (1999), Kalla et al (2000) and Pandya and Tailor (2008). The percentage of concordance was less for the borderline group with least correlation in mid borderline cases in the present study which is comparable to the results of Kalla et al (2000), Nadkarni and Rege (1999), Sharma et al (2008), Moorthy et al (2001), Shanker Narayan et al (2001), Bhatia et al (1993) and Singhi et al (2003).

However the results of Verma et al (1981) and Dubey et al (1981) differed from those obtained in our study.

The histopathological features in leprosy indicate the accurate tissue response while the clinical features indicate only the gross morphology of the lesions caused by the underlying pathology. Since tissue response varies in the disease spectrum due to variability of cell mediated immunity, it is logical to expect some disparity between clinical and histopathological features (Kar et al 1994)). Histopathological classification has the advantage over the clinical classification that it gives a better indication of any recent shifts in the patients position in the spectrum (Ridley DS 1974). The WHO classification remains useful for allocating patients to treatment groups. In the context of research, however, it is better to use the Ridley-Jopling classification, which promotes a better understanding of the disease pathology, prognosis and the risk factors for complications (Lockwood et al 2007).

Conclusion

We conclude that clinical and histopathological correlation for the Ridley and Jopling classification is better at the polar ends of the spectrum than the borderline cases. Histopathological examination should be carried out for all cases for proper classification of leprosy which may be helpful for better allocation of the patients to the treatment categories.

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