FAMILY STUDIES ON HANSENIASIS CASES

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ABSTRACT — Examination of intrafamilial contacts among the first degree relatives of 400 hanseniasis patients, revealed an additional 101 cases. Distribution pattern of disease types detected in the contacts, in relation to that found in the index cases, are analysed. An attempt has been made to evaluate the role of genetic factor in determining the type of hanseniasis in a patient.

Key words: Hanseniasis. Genetics.

1 INTRODUCTION

The disease spectrum of hanseniasis depends upon the degree of hosts' cell mediated immune to the infecting organism. Innate capacity to mount an effective cellular immunity against Hansen's bacilli is considered to be the determining factor in them who develop Virchowian hanseniasis[1], and this has been thought to be genetically determined[4].

But possible variations in the proportions of Virchowian and tuberculoid hanseniasis in family contacts of different types of hanseniasis patients have not been fully studied. In other words, it has not been established whether Virchowian or tuberculoid families exist[4] . Family study, therefore, is an important area for the further research.

In this context, this present study, conducted by us at the family level, was designed to evaluate the role of genetic factor in determining the type of hanseniasis in a patient.

2 MATERIAL AND METHODS

Four hundred unselected hanseniasis patients, irrespective of age, sex and

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the disease type, attending the hanseniasis clinic of Banaras Hindu University Hospital were taken up in this study. First degree relatives, who were the intrafamilial contacts of these patients, were subsequently brought to this clinic for examination with a view to detecting any evidence of hanseniasis in them. In a multiple case family, the member with longest duration of the disease was considered as the index case. The index case in a family was either a parent or a sib. The contacts were examined subsequently at a later date and not at the same time with the proposition, in order to avoid a bias in classifying the detected cases. Patients, were diagnosed clinically, bacteriologically and with histopathological aid in certain cases.

The working classification recommended by the National Hanseniasis Control Programme of India[5] was followed by us. According to this classification L indicated Virchowian types were included in N?L (intermediate), while tuberculoid, maculoanaesthetic and primary polyneuritic types were grouped as N type.

3 RESULTS

The following tables show the types of hanseniasis detected in first degree relatives of the index and their concordance pattern according to relationship between the index cases and their contacts.

3.1 Among 1334 contacts of 400 index cases examined 101 (7.6%) new cases were detected. Out of which N, N?L and L types were seen in 66 (65.3%), 30 (29.7%) and 5 (5%) cases respectively.

3.2 Out of 581 contacts of N types index case 23 (3.9%) ; and 36 out of 460 i.e. 7.3% in contacts of N?L type index case while 42 among 263 i.e. 15.9% of the contacts of L type index case were detected to have hanseniasis (ratio of N : N?L ::1:1.88 : 4.1).

3.3 Out of 42 cases detected in the contacts of L index cases, only 3 (7%) had L type. Similarly, 5.5% of the cases detected in contacts of N?L index cases, were found to be suffering from L type of the disease, while no case was found to be suffering from L type in N index cases. N type was predominant in the contacts of all types of index cases.

The distribution pattern of disease type detected in contacts in relation to various types of index cases is not different stastically ($P > 0.10$). Comparing two polar types (N and L) for disease type concordance between index cases and cases detected in ctntacts, it was found to be significantly high for N rather than the L type ($P < 0.03$).

3.4 Overall concordance rate for disease type in parent/child and sib/sib relationship between index cases and the cases in their contacts, was 36.6%. In parent/child relationship non-concordance (73.3%) was higher than the concordance rate (26.7%). But in case of sib/sib relationship concordance (65.4%) was seen to be more than the non-concordance rate (34.6%). Difference in the concordance rate in these two groups was highly significant statistically ($P < 0.001$) .

4 DISCUSSION

Significant disease type concordance between the index cases and those detected in their contacts, was observed in our study in respect to N type only. N type was detected in 87% of the

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TABLE 1 — Types of hanseniasis detected in first degree relatives in relation to the types of index cases.

Index cases Type	Index cases examined	First degree relative examined	First degree relatives with hanseniasis							
			N Type		N L Type		L Type		Total	
			N.º	%	N.º	%	N.º	%	N.º	%
N	117	581	20	87.0	3	13.0	—	—	23	3.9
N L	141	490	20	55.5	14	38.9	2	5.5	36	7.3
L	82	263	26	62.0	13	31.0	3	7.0	42	15.9
Total:	400	1334	66	65.3	30	29.7	5	5.0	101	7.6

$X^2 = 7.15$; df = 4; P — 0.10

TABLE 2 — Concordance for the disease type according to relationship between the index cases and their contacts.

Relationship.	Concordance.		Non-concordance.		Total	
	N.°	%	N.°	%	N.°	%
Parent/Child.	20	26.7	55	73.3	75	74.2
Sib/Sib.	17	65.4	9	34.6	26	25.8
Total:	37	36.6	64	63.4	101	100.0

$X^2 = 10.86$; $P < 0.001$

cases found in the contacts of N index cases. On the other hand, only 7% of the cases detected in contacts of L index cases, were found to have the same type (i.e. L type) (Table-1). Thus, disease type distribution pattern observed in the intrafamilial contacts among first degree relative of the index cases was more or less near the epidemiological expectation pattern of the same in our general population. Moreover, we have not observed either any 'clustering of Virchowian cases' in families or existence of so called `Virchowian families', in course of our study. In this respect, our observations are consistent with those of Horton & Povey. In their series, which included 84 multiple case families, the type of hanseniasis found in first degree relatives of the index cases were more nearly representative of general population than that of the index cases. This, in the opinion of the authors, tends to suggest that genetic defects are not the primary factors responsible for determination of hanseniasis type.

Disease type concordance rate for parent/child and sib/sib relationship in our series was 26.7% and 65.4% respectively, while the overall rate was 36.6% (Table-2). Horton & Povey[3] in their series observed an overall concordance rate of 42%, while in parent/child and sib/sib relationship the concordance rate was 40% and 45% respectively. In our present series, the significantly high concordance rate observed in sib/sib relationship could possibly be due to the fact that sibs shared an identical environment as against their parents who often had been in a different environment at the time of contacting the disease. Emphasis has earlier been placed upon the importance of environmental factors in hanseniasis[2,6] Horton & Povey[3], postulated that environment influenced the type of hanseniasis once developed and genotype had only a little role in this respect.

The observations made in our study do not indicate the existence of a Virchowian diathesis' in first degree relatives of the patients with Virchowian hanseniasis. We stress, however, that our intention was, by no means, to strike a discordant note or to disprove the yet unproved genetic theory, often considered as important as the disease itself.

RESUMO — O exame de contatos intrafamiliares entre parentes de 1.º grau de 400 pacientes de hanseníase revelou 101 casos adicionais. Sao analisados os modelos de distribuição dos tipos de hanseníase observados nos contatos em relação àqueles encontrados nos casos "index". Fez-se uma tentativa para avaliar os fatores genéticos na determinação dos tipos de hanseníase em um paciente. — Tradução do Editor.

Palavras-chave: Hanseníase. Genética.

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