Leprotic Reactions and Anabolic and Anti-Diabetic Drugs

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INTRODUCTION

One of the distressing phases of lepromatous leprosy is the lepra reaction. Some unfortunate ones get these bouts repeatedly and some others are almost continuously in reaction. Though relief can be given with treatment, it is temporary and repeated episodes of the reactionary phase progressively push the patients down hill. Lepromatous leprosy being a systemic disease M. Leprae is widely disseminated throughout the body. With such generalisation of the disease there is widespread infiltration of the skin, liver, testes, etc.

In such cases, clinically hypo-proteinemia and anaemia, are evident. Patients complain of pains and aches in the bones and joints, because during these reactions the adverse effect of leprosy on bones is at its worst (2). They often complain of testicular pain, general asthenia, and anorexia and their depressed mental state is obvious. In keeping with these signs and symptoms, the following abnormal findings are usually noted:

1. Loss of weight.
2. Reversed albumin: globulin ratio.
3. Increased Erythrocyte Sedimentation Rate (E.S.R.).
4. Decreased Haemoglobin.
5. Swelling of hands and feet.
6. Osteoporotic changes.

Lepra reaction does not seem to be a specific uniform response to one causative agent but it seems to be a response to a large number of widely differing agents. The therapeutic problem becomes more complicated and difficult because the exact nature of lepra-reaction is not clearly understood. Hence a clinician is continually hunting for better methods of relief and treatment. The present paper can be best described as a report

on such a hunt. Recently, several non-steroid compounds allied to testosterone *e.g.* *Oxymethalone, *i.e.* 17 Beta Hydroxy-2 hydroximethylene-17 alpha-methylandrostan-3 and *19 nor-androstenolone phenyl propionate **have come in use. They have a very favourable anabolic action and their androgenic effects are not as prominent (4). Therefore a wider application of these drugs even in females is possible. Pharmacologically and therapeutically they are found to be useful in conditions where there are manifestations of hypo-proteinemia as reflected by reversal of albumin: globulin ratio, oedema, decrease in body weight, asthenia, and depression etc. In leprosy subjects in question such a picture is very common, and hence one is inclined to employ these drugs in such cases as the signs and symptoms in these patients dovetail nicely with the therapeutic effects of this medication. Anapolon and Durabolin are also known to influence the calcium metabolism. This is an important therapeutic property as applied to leprosy, because it is known that derangement in blood calcium levels occurs with advanced disease (1, 3). The effect of these drugs on calcium metabolism is of greater interest now, as glucocorticoids commonly used in the treatment of lepra reaction are known to induce osteoporosis (7).

M. Leprae is known to invade the liver. Consequently liver functions are disturbed (6). Salubrious effects of anti-diabetic sulphonamide compounds on the liver function have been reported (5). Therefore in view of involvement of liver in leprosy *** D-860-Tolbutamide was added to this therapeutic study.

MATERIALS AND METHOD

Six patients of leprosy of lepromatous type have been studied. These patients were almost constantly suffering from reactions for a period varying between 2 and 5 years. Their skin smears were highly positive for *M. leprae* and the histological picture of skin biopsis confirmed the lepromatous type. They had oedema of hands and feet, which pitted on pressure. But this oedema was different from the one seen in Congestive Cardiac Failure which easily pits on pressure. All the patients were males. Their ages varied between 26 to 36 years. The general condition of these patients was poor. Two out of six cases were advanced cases and were bed-ridden (Case Nos. 1 & 2); two cases (Case No. 3 & 4) were of moderate type. Cases No. 5 & 6 were not far advanced and severity of their disease was even less than Case No. 3 and 4. Patients suffering from liver cirrhosis, cardiac and kidney diseases or diabetes were excluded. In all these patients Venereal Disease Research Laboratory test (V.D.R.L.) was negative and fasting blood sugar levels were within normal limits. Renal function tests done before therapeutic trials were within normal limits.

*Hereafter the trade names of the preparations *Anapolon and **Durabolin will be used respectively.

***Hereafter the trade name of Rastinon will be used.

METHODS

All the patients were inpatients and of a leprosy hospital†. They were transferred temporarily to a general hospital for laboratory investigations‡. Following investigations were carried out in each case:

1. Height and weight.
2. Haemoglobin, Erythrocyte Sedimentation Rate (E.S.R.) White blood cell count, total and differential.
3. Urine examination: Specific gravity, phenolsulphonphthalein test, albumin, sugar, microscopic.
4. Electrolytes – Sodium and Potassium levels in blood.
5. Liver function tests.
6. Liver biopsy.
7. Fundoscopy of eyes.
8. X-ray pictures of hands.
9. Biopsy of lepromatous lesions of the skin.
10. V.D.R.L. (Test at the Venereal Disease Research Laboratory for Syphilis.)
11. Fasting blood sugar level.
12. Skin smears for *M. leprae*.

These patients were put on the following therapeutic regime:

1. Anapolon 50 mg./day orally in two divided doses.
2. Injection Durabolin 25 mg./Intramuscularly once a week.
3. Rastinon 500 mg./day orally in two divided doses.

Case No. 1 was administered injection Durabolin only all along the course of the treatment. All the other five patients were given Anapolon for a period of first three months. Later they were put on injection Durabolin during the rest of the treatment schedule.

The following drugs were used as and when required. Gluco-corticoids trivvalent antimony compounds, Vit. B. Complex, Vit. C, Iron, Glucose, calcium, either orally or parentarally. Such supportive treatment was found to be of not much use prior to the use of the drugs under trial. These patients were given high protein diet in the form of milk reinforced by milk powder and eggs, in addition to their routine hospital diet.

RESULTS

The results of these investigations are given in the accompanying tables. It is obvious from Table No. 1 that all the patients have put on weight. There was an improvement in general health. They had a sense of well being. Those that were bed-ridden became ambulant (Case No. 1 & 2). However case No. 1 deteriorated during last three months. There is decrease in E.S.R. in all the cases except Case No. 4. Haemoglobin percentage and red blood cell counts have improved in all the patients except Case No. 3. The X-ray pictures of the Cases No. 5 and 6 showed fair amount of recalcification and arrest of atrophic changes. No such changes were observed in other patients (Table 2). During the first three months of trials there was an impression that the frequency of lepra reactions was

TABLE 1

Date	Height	Weight Lbs.	Liver function tests T.P.	Alb.	Glo.	1	2	B	r
Case No. 1									
24.11.62	5′–6½″	93	6·7	2·3	4·4				
18.3.63		98	8·35	2·6	5·7	0·78	1·03	1·13	2·4
21.9.63		100	5·5	1·39	4·11	0·91	0·49	1·08	1·83
Case No. 2									
2.1.63	5′–3½″	94	6·8	2·8	4	0·78	0·9	1·0	1·84
18.3.63		98	8·35	1·85	6·5	0·8	1·8	1·4	2·5
27.8.63		102	7·65	2·52	5·13	0·5	1·1	1·3	2·2
Case No. 3									
25.1.63	5′–6¾″	112	7·4	2·9	4·5	0·4	0·9	1·1	2·3
4.4.63		119	7·2	2·44	4·76	0·84	1·05	1·05	1·84
21.9.63		114	5·3	2·4	2·9	0·15	0·22	0·79	1·74
Case No. 4									
25.1.63	5′–1¾″	108	7·9	2·63	5·27	0·51	1·02	1·15	2·59
4.4.63		118	8·1	3·43	4·68	0·81	0·86	1·04	1·96
6.9.63		115	6·7	3·1	3·6	0·26	0·55	0·83	1·01
Case No. 5									
22.12.62	5′–3″	93	6·75	3	3·75	0·7	1·0	1·15	2·0
18.3.63		114	7·65	2·82	4·83	0·79	0·85	1·0	2·04
6.9.63		121	7	3·30	3·70	0·33	0·63	0·94	1·80
Case No. 6									
22.12.62	5′–6¼″	93	7·0	3·18	3·82	0·79	0·7	1·0	2·0
18.3.63		107	7·65	2·75	4·9	0·73	0·73	1·1	2·34
6.9.63		118	6·5	2·5	4·0	0·76	0·76	0·7	2·27

1 : *alpha one globulin*
2 : *alpha two globulin*
B : *Beta globulin*
r : *Gama globulin*

TABLE 2

Date	*E.S.R. mm./hr.*	*Hb. Gms. %*	*R.B.C. million c.m.m.*	*X-ray report of hands*
Case No. 1				
24.11.62	44	6	3	There is no improvement
18.3.63	38	8	3	or
21.9.63	30	9	3·5	restoration of cal. content of bone
Case No. 2				
2.1.63	44	8·5	2·8	
18.3.63	36	9·5	3	There is no improvement
27.8.63	32	9·5	3	
Case No. 3				
25·1·63	12	12	3·8	
4.4.63	5	12·5	4	There is no improvement
21.9.63	8	10·5	3	
Case No. 4				
25.1.63	20	9	3·4	
4.4.63	10	10	3·8	There is no improvement
6.9.63	28	10	4	
Case No. 5				
22.12.62	36	7	3·5	De-calcification changes. No atrophic changes.
18.3.63	28	11	4	Restoration of Ca. concent to normal level in bones.
6.9.63	26	12	4·5	
Case No. 6				
22.12.62	38	9	3	Osteoporotic changes and also atrophic changes.
18.3.63	26	10·5	3·5	Atrophic changes arrested and greater
6.9.63	30	11	3·8	amount of calcification is seen.

reduced. But at the end of this study it was found that there was no significant reduction in the number of reactions or their severity.

SUMMARY

Anabolic agents (Anapolon, Durabolin) have been therapeutically tried along with Rastinon (oral anti-diabetic agent) in cases of lepromatous leprosy.

An over-all improvement in body weight, E.S.R. and Haemoglobin percentage have been observed. In two cases recalcification of bones and arrest of process of osteoporosis is noted. Evaluation of the individual drug is indicated.

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