

CREATINE OF TENOTOMISED MUSCLE UNDER INFLUENCE OF PREDNISOLONE TREATMENT

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Summary : The prednisolone has got a devastating effect on the creatine content of muscle when it is tenotomised. In non-tenotomised muscle, prednisolone reduces the creatine content. The reduction of creatine content in prednisolone treated muscle which are tenotomised is due to perhaps the catabolic effect of glucocorticoid analogue on muscle protein together with inactivity of the muscle.

Key words : muscle creatine prednisolone

INTRODUCTION

Creatine is an essential biochemical component of muscle. Normally muscle contains 450 mg of creatine per hundred gram of muscle (1). It is reduced in different muscle disorders. Glucocorticosteroid has got a role too on the reduction of muscle creatine because it helps the catabolism of muscle (3). In the present study prednisolone was administered as an analogue of natural glucocorticosteroid.

MATERIAL AND METHODS

Total forty male albino rats weighing between 130-150 gms were taken in four groups having 10 animals in each group. Muscle creatine was estimated from muscle homogenates after dehydration of creatine into creatinine (6).

Animal groups for experiments were as follows :

1. Normal non-operated control group.
2. Sham-tenotomy group.
3. Tenotomy group.
4. Tenotomy with prednisolone treated group.

(5 mg of Prednisolone administered per kg of body weight daily orally).

All operations were done under Pentothal Sodium Anaesthesia (35 mg/kg body weight). Injections were given intraperitoneally. Group-1 animals had undergone no operation. Group-2 animals were operated only on the skin and deep fascia. Tenotomies were done in one side in Group-3 and Group-4, on the tendons of gastrocnemius muscle. Adequate antiseptic measures were taken before and after operation. Group-4 animals were fed with 5 mg of prednisolone/kg body wt/day for twenty one days just after the operation. All the animals were fed with standard laboratory diet containing wheat flour 40%, ground gram 40%, whole milk powder 15% and a salt mixture 5% (5). with multi vitamin drops. In addition water was given *ad libitum*.

At the end of the experiment, on the 22nd day, the animals were sacrificed and gastrocnemius muscles of both sides were severed, weighed and the muscle creatine contents were estimated.

RESULTS

There was significant reduction of muscle weight in tenotomy cases and in tenotomy cases with prednisolone treatment; the muscle weight was reduced by 16.08% and 16.23% respectively.

TABLE I : Effect of tenotomy and prednisolone on gastrocnemius muscle (n=10 experiments).

<i>Experiments</i>	<i>Weight in mg ± S.D.</i>	<i>Creatine content in mg% ± S.D.</i>
I. Control non-operated		
Right side	1274 ± 32.042 ^a	448.5 ± 24.006 ^a
Left side	1276 ± 42.216	450.9 ± 18.459
II. Sham tenotomy		
Non-operated side	1252 ± 38.239 ^a	428.8 ± 7.671 ^a
Operated side	1250 ± 44.477	431.1 ± 14.356
III. Tenotomy		
Non-operated side	1225 ± 30.640 ^v	456.6 ± 19.004 ^b
Operated side	1028 ± 25.298	393.9 ± 12.013
IV. Tenotomy with Prednisolone treatment		
Non-operated side	1232 ± 82.213 ^b	405.7 ± 9.393 ^b
Operated side	1032 ± 60.699	346.4 ± 13.962

S.D.=Standard Deviation. P>0.05=Not significant. P<0.001=Highly significant.

a=P>0.05 b=P<0.001.

In tenotomy, creatine content of the muscle was reduced to 393.9 mg% whereas in normal control side the creatine was 456.6 mg%. In prednisolone treated animals the creatine content in normal side was 405.7 mg% and in tenotomised muscle it was only 346.4 mg% (Vide Table I). From these observations it is obvious that though in prednisolone treated animal the muscle creatine is reduced both in normal muscle and in tenotomised muscle, the reduction of creatine is highly significant in tenotomised muscle (Table I).

DISCUSSION

In normal muscle, the effect of corticosteroid analogue (Triamcilone etc.) has got the catabolic effect (3). But the literature is meagre regarding the comparative studies on the effects of prednisolone like drugs on inactivated skeletal muscle. Muscle weight is lower in tenotomised cases than normal controls. This finding corroborates with the findings of Carey *et al.* (2) and Davenport and Ranson (4).

Creatine content of muscle is lowered in tenotomy. But in tenotomy with prednisolone treatment the creatine content was further reduced (Table I).

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