

CORTISONE AND ACTH TREATMENT OF POST-TRAUMATIC DYSTROPHY OF THE EXTREMITIES

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Post-traumatic dystrophy of the extremities is, even if not occurring very frequently, nevertheless invariably one of the most serious complications in almost every kind of trauma to the extremities. It seems to arise especially after fractures. *Blumensaat* (2) states that dystrophy was found in 6.6 % of 3,000 fractures. In its severer stages it presents a depressing picture of disease, and its treatment almost always makes great demands upon both patient and doctor's reserves of good will and patience, nor, unfortunately, is this always rewarded by a satisfactory result. All reasonable attempts to obtain better results by employing new—and perhaps effective—methods must, therefore, be of some interest.

Since the advent of ACTH and Cortisone, numerous cases of disease in the mobilising and supporting mechanism of the body have been treated with excellent effect owing to these substances. Although the most fundamental feature of the pathogenesis of dystrophy in the extremities is probably a dysfunction of the sympathetic nerve system (see e.g. surveys by *Haldbo* (4), *Blumensaat* (2), *Miller & Miller* (6), *Dwyer* (3)), all the mesenchymal tissue, at least in the later stage of the disease, seems to be affected, first and foremost, connective tissue and bone tissue. It seemed possible beforehand, therefore, that the disease could be favourably influenced by treatment with ACTH or Cortisone. Individual authors have also tested these substances in a few cases. *Sigler & Ensign* (8) and also *Sussman* (9) observed an excellent effect on the so-called shoulder-hand syndrome. *Dwyer* (3) found that a rapid and lasting effect was obtained in two cases of dystrophy of the extremity.

Since on the orthopaedical side (*Sv. Kiaer* (5)) special interest has been devoted in recent years to the treatment of post-traumatic dystrophy of the extremities, it appeared to us at the Orthopaedical Hospital a natural step to attempt treatment with Cortisone or ACTH. The results of this are presented in the following account.

THE AUTHOR'S SERIES

Our series comprises 18 patients, 11 women and 7 men aged between 21 and 68 years. The age distribution corresponds fairly well with the distribution in *Sv. Kiaer's* (5) series. We too found the majority of our cases to occur within the age group 40–60 years. All the cases are recorded in the table. We have sought to give an impression of the degrees of severity of the cases by pointing out the most important symptoms. Amongst these, in addition to pain, we have included trophic changes (skin atrophy, oedemas, nail changes or roentgenological bone changes), neurological changes (paresthesias, disturbances in sensibility), vascular changes (changes in the colour or temperature of the skin or vasomotor changes), perspiration fluctuations together with reduction in mobility. In addition oscillometric examination of 11 patients was performed on diagnostical grounds and this always showed a normal condition.

In 7 of the cases all the symptoms were found. These cases were considered to be very severe while the remaining 11 may be regarded as fairly severe. It must be mentioned in particular that 14 cases showed roentgenological signs of bone atrophy.

Furthermore, the table records the nature of the trauma concerned. As stated by other authors the intensity of the trauma bears no relation to the degree of severity of the dystrophy.

The columns which follow this set out the period of time from the trauma to the arising of the dystrophy and the initiation of the Cortisone or ACTH treatment respectively.

It will appear from the table that 9 patients, beforehand or simultaneously, had been treated by sympathetic nerve blocks, 8 by different forms of physiotherapy.

The treatment was adjusted to the individual, taking into consideration the degree of severity of the disease and the onset of direct effect or subsidiary effects. ACTH was injected into 17 patients for 1–4 weeks; between 10 and 20 units were administered daily or every other day. Moreover, cortisone was given to 5 patients in tablet form for 2–6 weeks, rising at the most to 25 mg four times daily. One patient (No. 11) received cortisone for only 11 days.

Case number	Sex	Age	Cause	Period from trauma to dystrophy	Period from trauma to treatment	Secondary treatment before or during cortisone treatment
1. 2557/53	Fem.	53	Fract. radii Fract. hum.	4-5 months	5 months	Reduction × 2 Immobilisation
2. 450/52	Fem.	42	Vulnus dilac. dig. 5 manus	?	4 months	Stellate block × 10
3. 1480/53	Fem.	37	Vulnus incis. dig. 2 manus	?	2 years	Stellate block × 12
4. 9696/52	Male	24	Ampat. traumat. dig. 2-4 manus	?	6 months	Stellate block × 12 Physiotherapy
5. 11248/51	Fem.	57	Fract. radii	6 weeks	3 months	Stellate block × 7 Immobilisation Physiotherapy
6. 12440/52	Fem.	61	Operat. Dupuytren	5 months	5 months	Stellate block × 10
7. 1782/53	Male	21	Vulnus incis. manus 1947. Contusio man. 1952	2 months	5 months	Stellate block × 5 Immobilisation Etylon
8. 12399/48	Fem.	57	Fract. radii	3 months	4 months	Immobilisation Physiotherapy
9. 5445/53	Male	53	Fract. colli hum.	1 months	2 months	Immob. - physio- ther. - Xylocain intraarticulation
10. 86/53	Fem.	68	Fract. radii	7 weeks	7 weeks	Immobilisation Stellate block × 2
11. 916/54	Fem.	60	Fract. radii disloc. sec.	4 weeks	3 months	Immobilisation Physiotherapy
12. 4501/53	Male	53	Fract. radii + con- tract. Dupytren	?	5½ months	Immobilisation
13. 11195/52	Male	57	Vulnus punct. + panaritium	1-2 months	4 months	Immobilisation + diathermy
14. 5757/53	Fem.	42	Contus. manus	1½ months	2 months	Stellate block Physiotherapy Immob. - plaster
15. 6095/53	Male	42	Fract. phal. 1. digit. manus	2 months	2½ months	—
16. 8323/52	Male	51	Operat. Dupuytren	?	3 months	Immob. 3 days Physiotherapy
17. 10205/43	Fem.	48	Vulnus incis. transc. tend.	1½ months	2 months	Neurolysis + tendon transplant. stellate block × 13. Sympa- thetomy (thorac.)
18. 8292/52	Fem.	58	Fract. digit. 2-5 manus	?	?	?

Symptoms before treatment						Follow-up examination primary effect		Late effects							
Pain	Trophic changes	Neural changes	Vascular changes	Perspir. changes	Mobility changes	Time	Result	Time	Pain	Trophic changes	Neural changes	Vascular changes	Perspir. changes	Mobility changes	Result
+	?	?	+	+	+	2 weeks	Recovered	1 year	÷	÷	÷	÷	÷	÷	Recovered
+	+	?	+	+	+	?	÷ Improvement	2 years	+	÷	÷	÷	÷	+	Improved
+	+	?	+	+	+	?	÷ Improvement	1 year	+	÷	÷	÷	÷	÷	Improved
+	+	+	?	+	+	?	÷ Improvement	1 year	+	÷	+	÷	÷	÷	Improved
+	+	+	+	÷	+	?	÷ Improvement	2 years	÷	÷	÷	÷	÷	÷	Recovered
+	+	+	+	+	+	3 months	Improved	1 year	÷	÷	+	÷	÷	+	Improved
+	+	+	+	+	+	4 weeks	Improved	1 year	+	÷	+	÷	÷	÷	Improved
+	+	+	?	+	+	2 months	Improved	1 year	+	÷	÷	÷	÷	÷	Improved
+	+	+	+	+	+	4 months	Improved	7 months	÷	÷	÷	÷	÷	÷	Recovered
+	+	+	?	?	+	?	÷ Improvement	1 year	+	÷	÷	÷	÷	÷	Improved
+	+	+	+	+	+	1 month	Improved	1 month	÷	+	÷	+	+	+	Improved
+	+	+	÷	+	+	3 weeks	Improved	6 months	+	÷	+	÷	÷	+	Improved
+	+	+	+	+	+	6 months	Improved	1 year	÷	÷	÷	÷	÷	+	Improved
+	+	+	+	+	+	6 months	Improved	6 months	÷	+	÷	÷	÷	+	Improved
+	+	+	÷	+	+	2 months	Improved	9 months	÷	÷	+	÷	÷	+	Improved
+	+	+	?	+	+	?	Improved	18 mths.	÷	÷	+	÷	?	÷	Improved
+	+	+	?	+	+	?	÷ Improvement	1 month							÷ Improvement
?	?	?	?	?	?	?	÷ Improvement	18 mths.	+	+	÷	÷	+	+	÷ Improvement

RESULTS

In the column of the table headed "primary effect" we have attempted to judge how soon after the beginning of the treatment a change in status takes place. In six cases no change was seen during the actual treatment. In a further three cases the improvement seen was so slow that it could not be accurately determined when the improvement commenced. Lastly the table records the results of the after-examination which took place 7-18 months after the treatment ceased. However, two of the patients (11 and 17) had ceased to receive treatment only one month beforehand. It will be seen that of the seven severe cases one was completely cured, five improved and one remained unchanged. Out of the eleven fairly severe cases two were completely cured, eight improved and one remained unchanged.

DISCUSSION

As the point of issue is what ACTH and Cortisone have achieved for our series of patients with post-traumatic dystrophy of the extremities, it must be remembered that the patients also received other treatment, namely, sympathetic nerve blocks in nine cases, physiotherapy amongst the remainder. This means that the treatment, apart from ACTH and Cortisone, has followed the same lines as adopted for the patients in *Sv. Kiaer's* (5) series and the latter have served as a control series for what is presented here.

The attempt to estimate in what way our results differ from, and possibly are better than *Sv. Kiaer's*, is not free from risk, however. The very varied symptomatology of the disease combined with the extraordinary slowness in the development of the clinical effect of the treatment demand that the greatest care be taken with the evaluation. In every case it may be said that no brilliant effect such as that found by *Dwyer* (3), for example, has been observed. Clinical healing was seen within fourteen days in one case only (No. 1). In the other cases the improvement did not commence with any certainty more rapidly than after the treatment adopted by *Sv. Kiaer* (5).

Our observation period is not so long as that given in *Sv. Kiaer's* article, but this author comments that his series did not support the assumption that a long observation period gives better end results.

Out of *Sv. Kiaer's* 22 patients, 5 recovered completely, 6 were "disabled in some degree" and 11 were "markedly disabled". In our series of 18 patients 3 recovered completely, 13 improved and 2 remained unchanged. We think, therefore, that we are justified in concluding that ACTH and Cortisone treatment has been of good service

in supplementing the nerve block treatment and the physiotherapy treatment. The last two therapeutic methods should be constantly employed, however.

It can hardly be expected that Cortisone or ACTH will have any definite effect, when the connective tissue changes are far-reaching. *Baxter* and others (1) together with *Ritchey* (7) thus found that Cortisone had slight effect on Dupuytren's contracture. In our series, however, we observed that the effect was independent of the degree of severity of the disease.

Our patients, unfortunately, were not treated with Cortisone or ACTH alone. Since these substances seem to have favourably influenced the results, and although a number of practical difficulties may be expected to occur, one would like to try and treat a group of patients with either ACTH or Cortisone alone.

SUMMARY

18 patients (11 women and 7 men) aged from 21 to 68 years were treated with Cortisone and ACTH. The dosage was individual, generally as used with polyarthrititis chron.

9 patients were treated either previously or simultaneously with sympathetic nerve blocks, 8 with different forms of physiotherapy. 7 cases must be described as severe, 1 of which recovered completely, 5 improved and 1 remained unchanged.

11 cases were fairly severe, of which 2 recovered completely, 8 improved and 1 remained unchanged.

In 1 fairly severe case complete recovery was seen in 14 days, in the other cases improvement took place after 4-6 months. The patients are followed up for 7-18 months.

From this it may be concluded that even if ACTH and Cortisone treatment did not produce brilliant results in the authors' series, they have proved, nevertheless, to supplement very well the treatment hitherto employed.

RESUME

18 malades (11 femmes et 7 hommes) âgés de 21 à 68 ans ont été traités par la cortisone et l'ACTH. On a adopté un dosage individuel, comme celui généralement administré dans les cas de polyarthroïte chronique.

9 malades ont été traités préalablement ou simultanément par blocage du nerf sympathique, 8 par différentes formes de physiothérapie. 7 cas doivent être considérés comme graves. L'un a été complètement guéri, 5 améliorés et un est resté inchangé.

11 cas étaient relativement graves. Parmi ceux-ci deux ont été entièrement guéris, 8 améliorés et un est resté inchangé.

Dans un cas relativement grave, la guérison complète est apparue au bout d'une quinzaine de jours, dans les autres cas les améliorations se sont manifestées après 4-6 mois. Les malades ont été suivis pendant une période de 7 à 18 mois.

On peut conclure de ces observations que même si le traitement par l'ACTH et la cortisone ne donne pas des résultats brillants dans les séries des auteurs, ces médicaments n'en constituent pas moins un très bon supplément au traitement appliqué jusqu'ici.

ZUSAMMENFASSUNG

18 Patienten (11 Frauen und 7 Männer) im Alter von 21 bis 68 Jahren wurden mit ACTH und Cortison behandelt. Es wurden individuelle Dosen im allgemeinen wie bei der chronischen Polyarthritits verabreicht.

9 Patienten wurden entweder vorher oder gleichzeitig mit Sympatikusblokade behandelt, 8 mit verschiedener physikalischer Therapie. 7 Fälle sind als schwer zu bezeichnen. Von diesen erholte sich einer vollständig, 5 waren gebessert und 1 Fall hielt sich unverändert.

11 Fälle erwiesen sich als mittelschwer. Von diesen erholten sich 2 vollständig, 8 waren gebessert und einer verblieb unverändert.

In 1 mittelschweren Fall wurde vollständige Wiederherstellung im Verlaufe von 14 Tagen beobachtet. Die anderen Fälle zeigten Besserung nach 4-6 Monaten. Die Patienten wurden über einen Zeitraum von 7-18 Monaten beobachtet.

Man kann daher den Schluss ziehen dass, selbst wenn die ACTH- und Cortisonbehandlung keine hervorragenden Ergebnisse an dem Krankengut der Verfasser hervorbrachte, so hat es sich doch gezeigt, dass sie die gebräuchlichen Behandlungsmethoden sehr gut unterstützt.

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