DERMATOMYOSITIS
(POIKILODERMATOMYOSITIS) TREATED WITH ACTH AND AUREOMYCIN

BY

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Dermatomyositis is apparently fairly closely related to scleroderma, lupus erythematosus disseminatus, calcinosis universalis, periarteritis nodosa, and Raynaud's disease, as intermediate varieties have been observed between these conditions, all of which appear to involve the collagen connective tissue in some way or other. The introduction of ACTH (the adrenocorticotropic hormone of the pituitary gland) opened up new therapeutic possibilities for this group of diseases. Dermatomyositis, however, does not appear to have been treated with ACTH except in a very few cases (Elkinton et al., 1949, and Oppel et al., 1950). In view of the rarity of the disease, the writers feel justified in describing a single case.

The condition was first described by Unverricht (1887), Hepp (1887) and Wagner (1887). The term dermatomyositis was coined in 1891 by Unverricht, whilst Hepp called it pseudo-trichinosis because of the numerous symptoms which it has in common with trichinosis. Although it is regarded as a rare lesion, Schuermann, in 1939, succeeded in collecting 263 cases from the literature, adding 10 of his own. Since then numerous cases have been published, especially by Scandinavian workers (Auken et al., 1945, Brandt, 1948, Erling, 1947, Espersen, 1944.
Franke et al., 1943, Grelland, 1948, Haxthausen, 1943, 1944, 1948, Heckscher, 1925, Holst, 1948, Kahlmester et al., 1944, Krabbe, 1942, Nielsen, 1942, and Olsson, 1945). Some disagreement exists as to its relation to the poikiloderma syndrome described by Petges (1930) and it was later grouped into localized and generalized poikiloderma as well as poikilodermatomyositis; at any rate there does not appear to be a sharp distinction between poikilodermatomyositis and dermatomyositis, the muscular affection being the decisive feature (Haxthausen, 1943, Nielsen, 1942, and O'Leary et al., 1940).

With regard to the clinical picture of dermatomyositis and poikilodermatomyositis, the reader is referred to the literature quoted above.

Recent therapeutic trials have included sulphonamides, penicillin, vitamin E (true, in much smaller doses than those used at present), and X-rays, all without convincing effect. Elkinton et al. (1949) and Oppel et al. (1950) have both recently reported a case treated with ACTH with excellent effect; in the latter case the effect persisted for four months after the withdrawal of ACTH.

CASE REPORT

Since poikilodermatomyositis is fairly rare and since this particular case was followed clinically for an unusually long period, it will be reported in some detail:

Male tailor's apprentice, aged 19.

At the age of 5 (1936) he suffered from a condition resembling rheumatic fever, stated to have been characterized by swelling, redness, and tenderness of the joints, accompanied by fever. Large as well as small joints were involved. No history of tonsillitis. Confined to bed at home for 9 months. In 1938 he had a similar attack, lasting, however, for only a few weeks. In 1939 pneumonia, measles, and erythema nodosum. Not hospitalized.

In 1940 he was admitted to hospital for atypical rheumatic
fever? Recurrent subcutaneous infiltrations accompanied by fever.

Ten days before admission, joint pains occurred again, and red, tender nodules were present in (?) the skin. During the 8 months in hospital, he had pains moving from joint to joint and affecting the large as well as the small joints. Nevertheless, the joints proper did not seem to be affected, there being in nearly all cases a tender infiltration with oedema in the vicinity of the painful joint; these lesions were alternately interpreted as enlargement of the lymph nodes, and as subcutaneous or muscular infiltrations. At one time a spindle-shaped swelling suggesting spina ventosa appeared on the phalanx of a finger. On admission he had bluish-red, tender, infiltrated patches on the face and limbs and bluish marbled areas resembling livores on the face and elbows. Later, nodules and infiltrations as large as peas began to appear periodically on the limbs. These lesions were red, tender, sometimes itched, and were sometimes arranged in rings. The mucous membranes were affected once, showing a soft nodule, the size of a hemp seed, on the hard palate. Moreover, generalized, moderate swelling of the lymph nodes was noted. There was no cardiac or pulmonary abnormality at any time. The temperature was periodically raised to about 39° C. and at other times normal. The general condition was at times very poor and the boy was in great pain.

Laboratory tests: Widal, Bunnell, blood culture, Wassermann (WR) negative; examination of the urine showed no protein, sugar, blood, or pus. W. B. C. 20,800 per cu. mm., differential count normal (2 per cent. eosinophils). Erythrocyte sedimentation rate (ESR) fluctuating, reaching a maximum of 92 mm./hour. Hæmoglobin level (Hb per cent.) between 49 and 90. Antistreptolysin titre (AST) on admission 1520, later decreasing. Cultures from the throat: hæmolytic streptococci of type B, group 28 on two occasions. Electrocardiogram (ECG) was normal on 31 occasions. X-ray of heart and lungs (several times), hips, and hands failed to show anything abnormal.
Not more than a fortnight after discharge (1941) he had a recurrence, associated with infectious hepatitis. He was transferred from a provincial hospital to his former hospital, where he remained for more than 8 months with practically the same symptoms as previously. In addition, marked local oedemas of the temples and around the eyes as well as pain in the chest occurred several times and there was also subcutaneous infiltration of the chest and, on one occasion, auscultatory evidence of râles. In spite of severe joint pains, an actual joint lesion was not demonstrable. The AST reached a maximum of 2510 and the ESR 99 mm./hour. The other laboratory tests were as previously, and repeated electrocardiograms failed to show any changes. Neither oto-rhino-laryngological nor dental examination showed any abnormality. After having been in excellent health for 5 months, the patient had another recurrence (1942) and stayed in hospital for 8 months, presenting the same symptoms. This time a temporary swelling of the scrotum was noted and aphthae in the alveolabial sulcus were recorded several times. The AST again reached 2500 and the ESR 130, the staphylococcus antitoxin titre was 4 units. There were still no signs of heart disease. After having been in good health for 6 months, he had a 3rd recurrence (1944) and was hospitalized for 5 months. Haemolytic streptococci of an indeterminate group were found on one occasion. AST maximum 1800 and ESR 120 mm.

In 1946 the patient was re-admitted, as he had applied to the Invalidity Insurance Court for economic support for his apprenticeship to a tailor. For the past 2 years his only complaints had been joint pains associated with colds and slight dyspnoea during fast cycling. Obj. exam. showed only slight swelling of a few finger joints, and slight swelling and moderately limited mobility of both ankle joints. There were still no signs of heart disease. ESR 20 mm., AST normal. Physical development somewhat delayed for his age. From 1946 he has been under observation at the Orthopaedic Hospital. During the course of a mild recurrence in 1948, numerous subcutaneous nodules were present, and biopsy showed fatty tissue with fibroid, almost cicatricial changes.
From January 1950 there was pain in the right wrist and in the calves on walking. He was, therefore, admitted to the Copenhagen Municipal Hospital, 7th Department, for observation (Jan. 1—March 15, 1950, case rec. 190/1950). On admission, examination showed an afebrile subject below normal weight and in a fairly good general condition. Obj. exam. showed an unusual skin disease, infiltrations in the calves and forearms, blepharoconjunctivitis, generalized moderate enlargement of the lymph nodes, a slightly reduced mobility of the ankles, and pain on major movements of the right wrist. Biopsy of the skin showed simple subacute-subchronic inflammation (sd. Johs. Clemmesen) and of the muscles chronic myositis (sd. Vraa) (see Fig. 1).

Fig. 1.
Scattered in the longitudinal section of muscle, muscle fibres with typical degenerative changes, showing marked narrowing and active nuclear proliferation. There is abundant and in places somewhat oedematous interstitial tissue. Scattered in the latter and particularly around the vessels, small infiltrations consisting of lymphocytes, plasma cells, histiocytes, and a number of fibroblasts. At one site in the interstitial tissue, remains of a striated muscle fibre in which the longitudinal as well as transverse striation is lost and also showing small, oval foci with small, slightly oblong nuclei. No signs of trichinosis or Boeck’s sarcoid, no Aschoff nodules (sd. Vraa).

Dermatological examination showed marbling of the skin with reddish cyanotic strands arranged like the threads of a coarse-meshed net (see Fig. 2).

No pigmentation or major telangiectases; on the elbows a few circumscribed, punched-out scars with a smooth, atrophic skin (see Fig. 3).

Diagnosis: Poikilodermatomyositis (Petges).
Poikiloderma. The skin, particularly on the buttocks, shows reddish cyanotic strands arranged like the threads of a coarse-meshed net.

Fig. 3.
Punched-out scars with atrophic skin on the elbow.
Laboratory tests: Examination of the urine for protein, sugar, pus, blood, creatine, and porphyrin negative. W. B. C., differential count, platelet count, WR, and venular blood culture normal. ECG, X-ray of heart and lungs, wrists, and ankles as well as of the soft parts of the legs showed nothing abnormal. Eosinophil count showed between 306 and 396 per cu. mm. B. P. 95/40, ESR 43 mm., AST 400, and Hb per cent 85.

Summary of the Case:

A male, aged 19, had been suffering, at any rate from the age of 9, from prolonged, febrile attacks accompanied by »articular pain« and almost universal infiltrations in the subcutaneous tissues and muscles, local areas of oedemas, and bluish-red, tender nodules under the skin, and a periodically poor general condition. In the course of 5 admissions to hospital, totalling about 3 years, during which the condition was interpreted as (atypical) rheumatic fever, the patient did not at any time show auscultatory, electrocardiographic (on about 90 occasions) or X-ray (on repeated occasions) signs of heart disease. In the intervals he was almost symptom-free. On admission to the Copenhagen Municipal Hospital, Department 7, his skin was marbled, showing reddish cyanotic strands arranged like the threads in a coarse-meshed net (Fig. 2), circumscribed, punched-out scars with smooth, atrophic skin on the elbows (Fig. 3), infiltrations in the forearms and calves, and histological signs of subacute-subchronic inflammation of the skin and chronic myositis (Fig. 1).

Treatment:

When, on Feb. 24, 1950, the temperature rose to 38.2° C., and the patient had slight pain on swallowing, slight redness of the throat, and pain referred to the joints, penicillin (150,000 I. U. twice daily) was administered. The condition, however, remained unchanged, and after 7 days' treatment, he was given aureomycin (500 mg. three times daily). The temperature returned to normal within 2 days. All the subcutaneous infiltrations and the »articular pain« responded to 8 days' treatment. The patient was discharged in good health with an
ESR of 7 mm. Not more than 3 days later — 7 days after aureomycin was withdrawn — there was a recurrence of the infiltrations in the calves, and of the pain and tension in the muscles of the calves on walking.

May 15, 1950: Re-admitted for treatment with ACTH. At this time he had 5 infiltrations, as large as beans, in the right calf and 4 in the left one. The other objective findings were as on the previous admission.

The dosage of ACTH (Vermehren’s preparation from Frederiksberg Chemical Factories) was, as is apparent from Fig. 4, 5 mg. × 4 for 2 days, 8 mg. × 5 for 6 days, 4 mg. × 5 for 1 day, and 2 mg. × 5 for 19 days. In the course of 4 weeks he received a total of 480 mg. After the drug had been administered for 4 days, the infiltrations had subsided perceptibly, and
Fig. 4a and b.
Laboratory tests before, during and after treatment with ACTH. During the period June 3—12, he received 15 ml. of potassium phosphate, 10 per cent., by mouth.
after 9 days they had disappeared. The poikiloderma was not definitely affected and 18 verrucae vulgaris remained unchanged.

During the treatment with ACTH the patient gained weight (see Fig. 4), showed swelling and increased redness of the face, development of the breasts, and a clinical picture suggestive of Cushing’s syndrome (Fig. 5). He had an eruption of papular-pustular acne affecting the trunk and limbs and, to a less extent, the face. The growth of beard was not accentuated, and the patient still did not have to shave more than once weekly. The temperature remained normal throughout the course of treatment. The only subjective complaints were mild headache and a feeling of fullness in the face. The decreasing serum potassium (see Fig. 4) did not give rise to subjective discomfort, but the patient was for some time given prophylactic potassium by mouth.

The various biological changes caused by the drug are set out in Figs. 4 a and 4 b.

Fig. 5.
»Moon-faced« appearance during ACTH therapy.
Most of the changes are well known and bear testimony to the effectiveness of the drug. The marked excretion of creatine which occurred two days before the treatment was discontinued (max. 732 mg. in the 24 hours) and which subsided slowly during the first week after the drug was withdrawn, coincided with a marked increase in the urinary excretion of chlorides and in the daily output of urine.

Repeated biopsy after a fortnight of ACTH therapy showed: In the muscles still some atrophic fibres scattered among normal and slightly hypertrophic fibres. Still rather ample interstitial tissue, but only moderate infiltration. The infiltrating cells were mostly fibroblasts, and histiocytes with an occasional lymphocyte. The skin biopsy showed ample, firm connective tissue in the corium, which was moderately vascularized. Around the small arteries an occasional lymphocyte, histiocyte and fibroblast, but no actual inflammatory infiltration. The appearance was far more like normal than that observed at the first examination.

Subsequent Course:

Five days after cessation of the treatment the patient was discharged in good health. Ten days later he was still without infiltrations, but was troubled when walking by the wound left by the last biopsy, which had not yet healed. Otherwise, his condition was satisfactory and the Cushing symptoms had disappeared.

DISCUSSION

The diagnosis of poikilodermatomyositis must be considered as confirmed by the characteristic skin condition and the histological evidence of dermatitis and myositis.

Presumably the recurrent infiltrations, local oedemas, and eruptions, accompanied by fever, which had been present off and on from the age of 9, were early manifestations of the same disease, although biopsies were not obtained at that time. The numerous normal electrocardiograms taken during these attacks and the completely normal heart 10 years after the
first attack as well as the slight articular changes would appear to definitely exclude the diagnosis of rheumatic fever, especially in a child who had been confined to bed for years. The high AST (up to 2500) and the repeated findings of hæmolytic streptococci during these periods suggests the possibility of a closer causal relationship between streptococcal infection and dermatomyositis.

It is difficult to evaluate the effect of the treatment with certainty, partly because so many (spontaneous) remissions had occurred previously, and partly because the general condition was good at the time, and the infiltrations slight. Aureomycin appears to have had some effect, since the temperature promptly fell and the infiltrations subsided, but they returned soon after the treatment was discontinued. During the administration of ACTH in biologically effective doses, the infiltrations in the calves disappeared, and renewed biopsy from the muscles showed »dermatomyositis in the process of healing«. It must be considered likely, but not absolutely certain, that ACTH was the cause of this improvement. The skin condition (poikiloderma), on the other hand, failed to show a clinically visible effect. As the follow-up period is still too short, it is impossible to decide whether the administration of ACTH was curative or merely caused a temporary remission.

SUMMARY

A case of (poikilo)-dermatomyositis in a 19-year-old male is presented. The disease, which set in at the age of 9 (or perhaps even at 5) ran a course interrupted by remissions for years and was interpreted as atypical rheumatic fever. Penicillin proved ineffective. Aureomycin resulted in an apparent remission, without, however, affecting the skin condition, but a recurrence appeared soon after. During administration of ACTH for 28 days, a total of 480 mg., the myositis was improved — confirmed by biopsies — but there was no definitive effect on the poikiloderma. A number of verrucae vulgaris remained unaffected. Among the untoward effects of the treat-
ment it is worth mentioning a moderate Cushing’s syndrome, which disappeared after discontinuation of the treatment, an eruption of generalized acne, and hypopotassemia which produced no symptoms.

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