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# Acrodermatitis chronica atrophicans in prolonged borrelia infection

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## SHORT CASE REPORT

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## **BACKGROUND**

Acrodermatitis chronica atrophicans (ACA) is a late manifestation of *Borrelia* infection and is easily overlooked, especially in elderly patients.

## **CASE PRESENTATION**

A woman in her fifties presented with dizziness, general muscle stiffness, chills, nausea and a feeling of transient shock in her head during dosage reduction of escitalopram. The symptoms were therefore initially misinterpreted as related to her psychiatric disorder. Four months after the first symptoms presented, she complained that her right foot had become one shoe size larger than her left. Skin manifestations were found to be consistent with acrodermatitis chronica atrophicans.

## **INTERPRETATION**

Acrodermatitis chronica atrophicans is uncommon and affects women more than men. The skin changes mostly occur on the dorsal side of the extremities, often the feet or hands. The diagnosis is confirmed by positive serum antibodies (high level of IgG, and IgM can also be present), and a positive *Borrelia* PCR skin test.

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**A woman in her fifties who was a keen walker had visited the doctor several times due to the onset of new non-specific symptoms. It was only when she mentioned that her right foot had increased a whole shoe size that the correct diagnosis was suspected.**

In the early summer, a woman in her fifties developed non-specific dizziness, general body stiffness, chills, nausea and shock sensations in the head. She had a history of depression for a number of years and was taking the antidepressant escitalopram 10 mg daily. She was also taking rosuvastatin 20 mg for primary prevention of hypercholesterolaemia and atherosclerosis. The escitalopram dose was being reduced when her symptoms started. When she developed the first symptoms, these were assumed to be related to mental illness and the dose reduction, even though the discontinuation recommendations were followed.

At another contact one month later, she still had dizziness and shock sensations in the head and had become stiff and achy, particularly in the lower extremities. Earlier that winter, her dose of the cholesterol-lowering drug rosuvastatin had been increased. The possibility of the symptoms being adverse effects of this was considered, and it was decided to reduce the dose from 20 mg daily to 10 mg daily over the course of a few weeks. She did not experience any

significant improvement after the dose reduction. Blood tests were taken for screening (white blood cells, haemoglobin, platelets, C-reactive protein (CRP), creatinine, creatine kinase (CK), alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma-glutamyl transferase (gamma-GT), sodium, potassium), the results of which were all normal.

At another doctor's appointment 4 months after the first contact, she mentioned that her right foot had become so swollen that she had gone up a whole shoe size. Dizziness, body stiffness and shock sensations in the head were still present, and she reported occasional palpitations and exhaustion/fatigue in addition to pain under the sole of the foot that made it almost impossible to go hiking. This significantly reduced her quality of life.

On inspection, diffuse swelling was found over the dorsal part of the right foot and toes to just above the ankle. The skin here had a bluish discoloration and with a shiny appearance. (Figure 1). Ultrasound examination carried out by the general practitioner (who is a rheumatologist) showed normal findings for the tendons and joints in the ankle and foot. No subcutaneous oedema was found. New screening blood tests showed no abnormalities, apart from slightly elevated uric acid levels of 415  $\mu\text{mol/L}$  (reference range 155–400). The blood tests also included white blood cells, haemoglobin, platelets, CRP, creatinine, CK, ALT, AST, gamma-GT, sodium, potassium, vitamin B<sub>12</sub> and thyroid hormone, as well as rheumatology tests.



**Figure 1** Acrodermatitis chronica atrophicans on the dorsal right foot. There is a clear difference in size around the ankle and forefoot. The skin has purple discoloration, is dry, wrinkled and papery.

Since the patient lived in a coastal municipality in Southern Norway and was out in the woods a lot, tests for borrelia-specific serum antibodies were carried out. Both IgM and IgG antibodies were detected, with IgG levels being moderate to high (84; <5 is negative). She had registered several tick bites over the summer, but reported that she had quickly removed them.

Systemic borreliosis was now suspected based on the positive borrelia-specific antibody test and the patient's additional symptoms. Therefore, she was rapidly referred for an outpatient appointment at the neurology department. The only finding of a neurological examination was hyperaesthesia in the area of skin with bluish discoloration. The swelling of the foot and around the ankle was also objectively verified with a measuring tape. Polymerase chain reaction (PCR) testing was carried out for direct detection of tick-borne agents in blood. Cerebrospinal fluid testing showed no evidence of infection/inflammation or

intrathecal production of borrelia-specific antibodies as would be the case in neuroborreliosis. The general practitioner took a punch biopsy from the skin rash. PCR testing of the biopsy was positive for *Borrelia burgdorferi sensu lato* (16 S rRNA (ribosomal ribonucleic acid) and OspA (outer-surface protein A)).

Since there was a strong suspicion of a borrelia infection in the skin called acrodermatitis chronica atrophicans, in accordance with current guidelines (1) treatment with doxycycline was started (200 mg daily) before the results of the biopsy were available. At a follow-up after the planned 3 weeks of treatment, the patient reported that she had continued discomfort and swelling in the right foot, but that her energy was back and the dizziness, shock sensations in the head and palpitations had resolved.

The patient was followed up with neurography of the lower extremity 8 weeks after initiation of antibiotic treatment, which was described as normal.

Almost a year after the onset of symptoms, and about 6 months after the end of treatment, the patient still suffers from exhaustion, which is mainly related to the mental illness. Her right foot is still slightly larger than the left, and she wears thicker socks in the left shoe to pad it out better. The skin changes have largely resolved.

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## Discussion

Acrodermatitis chronica atrophicans is the most common symptom of late borrelia infection in the skin and can be easy to miss, particularly in the elderly (1). There are few major studies. The condition is rare and affects women more frequently than men. The rash in acrodermatitis chronica atrophicans is usually located on the extensor sides of the upper or lower extremities, particularly on feet and hands. Purple/blue discolouration with localised skin swelling is often seen initially, before it progresses to a later stage with fibrosis and skin atrophy. In terms of differential diagnoses, the skin changes can be misinterpreted as morphea or lichen sclerosus et atrophicus.

Knee and ankle joint effusion is not uncommon. Exhaustion and personality changes have been described (2). As the photograph of our patient shows, the skin is swollen, discoloured, often thinned like cigarette paper with a shiny appearance, and it may be slightly scaly. Our patient probably had a systemic borrelia infection with general symptoms, associated with the manifestation of acrodermatitis chronica atrophicans. A definitive diagnosis can be made by skin biopsy for direct detection of borrelia bacteria. This biopsy should be taken at the peripheral border of the rash and is positive in approximately 80 % of cases (3). The specimen can be sent in a standard transport medium, or 9 % NaCl, to the Department of Medical Microbiology, Sørlandet Hospital, which is the reference laboratory for borrelia diagnostic testing in Norway.

In this patient, the biopsy was taken by the general practitioner from the medial side of the dorsal part of the foot at the medial cuneiform bone. A simple punch biopsy of the skin is generally a good diagnostic tool in

investigating skin manifestations. Immunohistology requires rapid dispatch to a regional laboratory and is probably most applicable in the specialist health service.

Antibody levels of borrelia-specific IgG are usually high in patients diagnosed with acrodermatitis chronica atrophicans. IgM antibodies may also be present. Treatment should be considered in cases where there is strong clinical suspicion and/or high borrelia-specific IgG in serum even if PCR testing of a skin biopsy is negative, since PCR tests are not 100 % sensitive. Doxycycline 200 mg daily for 3 weeks usually helps with exhaustion and muscle and joint symptoms (1), but the effect on skin manifestations and neuropathy symptoms can vary (4).

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*The patient has given consent for the article to be published. The article has been peer-reviewed.*

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## LITERATURE

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