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Diabetic osteoarthropathy care in Sweden – Need for improvement: A national inventory

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ABSTRACT

Aims: Osteoarthropathy, a rare foot complication in patients with diabetes mellitus, calls for immediate and optimal management to prevent irreversible bone/joint destruction and risk of amputation. Awareness of the condition and adequate guidelines would minimize the consequences and the costs, both for the patient and for the society. We investigated the diabetic osteoarthropathy care in Swedish orthopedic clinics.

Methods: A questionnaire was distributed to 63 Swedish hospitals with emergency department for orthopedic patients. There was a 95% response rate.

Results: Most of the respondents (79%) specified absence of established procedures including guidelines for managing patients with osteoarthropathy. The most common diagnostic method was clinical diagnosis and plain X-ray (95%). MRI or scintigraphy was used by 19% and 10.5% respectively. As treatment method, 84% used a total contact cast, while 38% used orthoses. Treatment duration <3 months was reported in 4%, 3–6 months in 53% and 6–12 months in 28% of the clinics. Four clinics reported treatment duration >12 months and two clinics provided no treatment.

Conclusion: Our national inventory indicates a need for improvement in knowledge as well as guidance and organization at orthopedic clinics regarding optimal care of patients with diabetic osteoarthropathy.

Introduction

Neuropathic foot arthropathy was first described in patients with tabes dorsalis by Jean-Marie Charcot in 1868 [1]. The association between osteoarthropathy and diabetes mellitus was presented by Jordan [2]. Despite the condition being known for such a long time the diagnostic and treatment options have been limited. However, the reconstruction techniques for unavoidable osteoarthropathy foot deformity have substantially improved during the 20th century [3].

The diagnosis of diabetic osteoarthropathy today is associated with already affected and fractured bones. This will require advanced reconstructive surgery including a long rehabilitation period with reduced mobility for the patient. Moreover, there will be a risk for amputation if the osteoarthropathy is complicated by chronic ulcers and/or chronic infections [4].

As the current diagnosis is based on plain X-ray findings with a destruction of the foot skeleton (Fig. 1a-b) the condition, to some extent, has already become too aggravated to heal without sequelae. New diagnostic methods facilitating earlier diagnosis is therefore imperative. More advanced diagnostic tools have been evaluated, with MRI (magnetic resonance imaging) emerging as highly sensitive for the early detection of osteoarthropathy. Unfortunately, due to the similarities with osteomyelitis, the specificity of MRI is unsatisfactory but MRI could probably be a valuable diagnostic alternative [5–7]. Bone scintigraphy is another imaging technique which shows a high sensitivity for bone pathology with increased uptake in patients with osteoarthropathy [8]. Impaired circulation can, however, result in a false-negative result and the uptake of the radionuclide tracers used is not specific for

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Fig. 1. Plain anteroposterior X-ray (A-B), on diabetic patient presenting with a hot swollen right foot which was considered as degenerative changes without signs of osteoarthropathy (A). New X-ray 4 month later showed signs consistent with osteoarthropathy (B).

osteoarthropathy [9]. Positron emission tomography (PET) scanning with 18F-FDG has been proposed as a possible diagnostic pathway [10,11]. However, more research is necessary before this technique can be applied in clinical practice.

There have been different pathophysiological models for osteoarthropathy. The original French theory is based on Charcot's studies of ataxia and finds the cause of the condition in lesions in the spinal cord.

The German theory, as promoted by Volkman and Virchow, focuses on multiple traumas to the joints. The neurovascular theory which could be connected with the French suggests that a neurally initiated vascular reflex leads to activation of osteoclasts and thereby bone resorption and fragility of the bone [2]. However, none of these theories provide a comprehensive explanation for diabetes osteoarthropathy.

Recently the inflammatory role of the condition especially receptor activator of the nuclear factor kappa B ligand (RANKL), NF-κB and osteopotegerin (OPG) has been thoroughly discussed [12–14]. With better understanding of the inflammatory mechanisms new therapeutical options seems possible.

The current treatment is focused on an immediate reduction of the bone-altering effects of the inflammatory condition. This usually implies long treatment periods of total off-loading with casts/orthosis and with non-weight bearing regimes and a considerable risk of low compliance.

Although diabetic osteoarthropathy is a rare foot complication with an estimated incidence of 0, 8–8% [15] the impact for the patient will be a reduced quality of life [16–18] including anxiety and depression [19] and for the society substantial health economical costs [20].

The condition is by our experience overlooked and often missed- and/or late diagnosed and there is in Sweden currently no information available regarding the caregiving of this patient group.

The purpose of this study was to make a national inventory of orthopedic caregivers' organization for the diagnosis and treatment of diabetic osteoarthropathy.

Methods

This descriptive and cross-sectional study was carried out during the spring and early summer of 2014. Based on a registry from the Swedish Association of Local Authorities and Regions (SKL), 73 hospitals with emergency departments for orthopedic patients were identified. Since 14 of the hospitals were so-called "joint