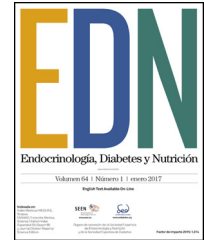




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REVIEW ARTICLE

Diagnostic and therapeutic update on diabetic foot osteomyelitis[☆]

José Luis Lázaro-Martínez^{a,*}, Aroa Tardáguila-García^a, José Luis García-Klepzig^b

^a *Unidad de Pie Diabético, Universidad Complutense de Madrid, Instituto de Investigación Sanitaria del Hospital Clínico San Carlos (IdISSC), Madrid, Spain*

^b *Servicio de Medicina Interna, Hospital Clínico San Carlos, Madrid, Spain*

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Abstract Diabetic foot osteomyelitis (DFO) is the most common infection associated to diabetic foot ulcers (DFU). This review is designed to provide an update on the diagnosis and treatment of DFO based on an analysis of MEDLINE through PubMed using as search criterion "Diabetic Foot Osteomyelitis". Authors have included in this review the most relevant manuscripts regarding diagnosis and treatment of DFO. After review and critical analysis of publications, it may be concluded that diagnosis of DFO is not simple because of its heterogeneous presentation. Clinical inflammatory signs, probe-to-bone test, and plain X-rays are postulated as the basic tests for clinical diagnosis when DFO is suspected. Diagnosis should be supported by laboratory tests, of which ESR (>70 mm/h) has been shown to be most precise. MRI is the most accurate imaging test, especially for differential diagnosis with Charcot foot. Pathogen isolation by bone culture is essential when the patient is treated with ATB only. Medical or surgical treatment should be based on the clinical characteristics of the patient and the lesion. Surgery should always be an option if medical treatment fails.

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* Corresponding author.

E-mail address: diabetes@ucm.es (J.L. Lázaro-Martínez).

PALABRAS CLAVE

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Osteomielitis de pie diabético;
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Actualización diagnóstica y terapéutica en el pie diabético complicado con osteomielitis

Resumen La osteomielitis (OM) es la infección más frecuente asociada a las úlceras de pie diabético (PD). En la presente revisión se pretende ofrecer una actualización sobre el diagnóstico y el tratamiento de la OM de PD tras analizar fundamentalmente la base de datos MEDLINE a través de Pubmed con los criterios de búsqueda «Diabetic Foot Osteomyelitis». Se incluyeron en la presente revisión a criterio del autor los artículos más relevantes en el campo diagnóstico y terapéutico de la OM de PD. Tras la revisión y el análisis crítico de las publicaciones se puede concluir que el diagnóstico de la OM en PD no es sencillo debido a su presentación heterogénea. La recogida de signos clínicos inflamatorios junto al test del Probe-To-Bone y la radiografía simple se postulan como las pruebas de diagnóstico clínico básicas ante la sospecha de OM. La confirmación diagnóstica debería estar respaldada con la evaluación de pruebas de laboratorio, donde la VSG (>70 mm/h) ha demostrado ser el valor más preciso. La RMN es la prueba de imagen con mayor precisión diagnóstica y cobra especial valor en el diagnóstico diferencial con el pie de Charcot. El aislamiento del patógeno mediante cultivo óseo es básico sobre todo cuando el paciente se trata exclusivamente con ATB. El tratamiento médico o quirúrgico debe basarse en las características clínicas del paciente y de la lesión, debiendo ser la cirugía siempre una opción posible en caso de fracaso del tratamiento médico.

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Introduction

Diabetic foot (DF) is a complication of diabetes mellitus resulting from foot ulcers caused by external or internal trauma associated with different stages of diabetic neuropathy and peripheral vascular disease.¹ The most severe consequence of a diabetic foot ulcer is a major or minor amputation.² Major amputation has been related to a dramatic reduction in the life expectancy of these patients, whose mortality rates approach and sometimes surpass those of colon, prostate and breast cancers, and Hodgkin's disease.³

Foot or leg amputation mainly results from ischemia- or infection-related events, the latter being the main cause.⁴ Diabetic foot infection may involve soft tissues or bone. Soft tissue infections are more severe and have a worse prognosis. However, osteomyelitis (OM) is the most common diabetic foot infection, accounting for more than 20% of moderate infections and 50%–60% of severe infections, which are associated with a high amputation rate.⁵

Osteomyelitis in diabetic foot represents a diagnostic and therapeutic challenge, and many consequences of the condition are clearly associated with late diagnosis, delayed referral, or inadequate treatment.

This literature review is intended to establish recommendations based on both the evidence and the authors' clinical experience to provide readers with diagnostic criteria and guidance for better therapy.

Methods

This literature review has been based on a retrospective search up to July 2016 of the main healthcare databases, particularly MEDLINE through PubMed. The search criteria

used to select articles were the keywords "diabetic foot osteomyelitis" included in the title or abstract. The review also included current versions of the international consensus guidelines on the evaluation and management of diabetic foot infections published by the Infectious Diseases American Association (2012 IDSA guidelines), and the International Working Group on the Diabetic Foot (2015 IWGDF guidelines).

Article selection was directional and at the authors' discretion, and focused on diabetic foot osteomyelitis (DFO) diagnosis and treatment. Once the articles had been examined, the review was structured using the following sections: diagnosis of DFO (clinical diagnosis, laboratory tests, microbiological and histological analysis, and imaging tests), and treatment of DFO (medical and surgical).

Diagnosis of diabetic foot osteomyelitis

Diagnosis of DFO always begins with clinical suspicion of the infection. Suspicion is relatively obvious when OM is associated with soft tissue infection because there is inflammatory response in the tissues. The presence of clinical signs of inflammation in an ulcer near a bony prominence (pain, heat, redness, swelling, and cellulitis) and/or a purulent or synovial discharge from a joint suggest OM. However, according to the literature, the clinical signs associated with bone infection are not very relevant for diagnosis.⁶

Visible bone through the ulcer, the exposure of capsular structures, granuloma not adhering to the ulcer bed, sausage toe (gross inflammation of a toe that prevents the identification of intra-articular folds) and/or an ulcer that does not progress within 12 weeks in a patient without ischemia and with an adequate off-loading device are all signs directly related to DFO.⁵

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