COMPARATIVE CLINICAL OUTCOMES OF PATIENTS WITH DIABETIC FOOT ULCERS (DFUS) AND ISCHEMIA VERSUS PATIENTS WITH DFUS AND MEDIAL ARTERY CALCIFICATION (MAC)

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Introduction

Peripheral arterial disease (PAD), specifically in the form of lower-extremity occlusive disease and the development of medial arterial calcification (MAC), contributes to diabetic foot development [1] . The MAC was first described by Mönckeberg in 1903 and initially though to be of no clinical significance [2]. Subsequent studies have found that radiographic arterial calcification (RAC) was associated with duration of diabetes, retinopathy, albuminuria, and PAD [3]. Moreover the time of healing of diabetic foot ulcers complicated by osteomyelitis treated by surgery can be negatively affected by the presence of RAC even more than by the presence of mild and moderate ischemia [4]. These studies recommend investigations on the topic of lower-extremity arterial calcification.

Aim

To compare the clinical outcomes among outpatients with diabetic foot ulcers (DFUs) and ischemia versus outpatients with DFU and MAC.

Method

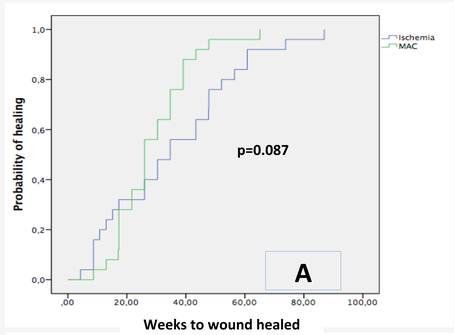
We have performed an observational retrospective cohort study including 50 patients divided in two groups (25 with mild or moderate ischemia and 25 with MAC according to the ankle-brachial index (ABI) and/or toe-brachial index (TBI) values. Clinical outcomes and blood parameters between two groups were analysed. In addition, for each patient anteroposterior XR-plains were reviewed to evaluate the presence of RAC and a second analysis was performed dividing the study population in patients with RAC or not RAC.

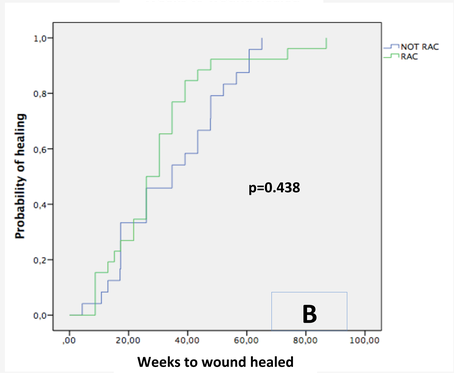
This study protocol received full approval from the local Ethics committee of the Hospital Clínico San Carlos, Madrid, Spain (C.P.20/056E_TFM).

Results/Discussion

Significance differences in mean healing time (28.8 ±12.5 versus 35.6±22.3 weeks , p=0,191) were not observed among groups according to the ABI and/or TBI values (MAC versus PAD) or according to the presence or not of RAC (30.1 ±18.5 versus 34.4±18.0 weeks respectively, p=0,411).

Figures 1 A and 1 B depict the time to wound healing Kaplan-Meir survival curve for the presence of ischemic/ MAC or RAC/NOT RAC respectively.





- ✓ As one expect, patients with ischemia were significantly associated with lower mean $TcPO_2$ (mmHg) value (28,64 ± 10,48 versus 41,28 ± 10,53, p<0.001).
- ✓ Patients without RAC were significantly associated with higher levels of total cholesterol (155.58±39.8 versus 130.73±25.2 mg/dl, p=0,013), HDL (49.54 ±20.0 versus 38.18± 10.7 mg/dl, p=0.005), LDL (82.08±25.7 versus 65.34±18.3 mg/dl, p=0.010), hematocrit (42.16 ±4.55 % versus 38.85±5.95 %, p=0.033) and hemoglobin (13.73 ±1.6 versus 12.69 ±1.91 g/dL, p=0.044).
- ✓ Moreover, patients with RAC were significantly associated with higher number of minor amputations until wound healing [RAC 30,8% (8/26) versus NOT RAC 4%, (1/24), OR 10.22, 95% CI 1.12-89.39, p=0,014].

Conclusion

Patients with DFU and MAC had not significance differences in mean healing time comparing with patients with DFU and ischemia. The presence of RAC were significantly associated with higher number of minor amputations until wound healing.

References

1. Cardenas V, Seo K, Sheth S, Meyr AJ. Prevalence of Lower-Extremity Arterial Calcification in Patients with Diabetes Mellitus Complicated by Foot Disease at an Urban US Tertiary-Care Center. J Am Podiatr Med Assoc 2018;108(4):267-71 doi: 10.7547/16-075(2):292-99. 2. David Smith C, Gavin Bilmen J, Iqbal S, Robey S, Pereira M. Medial artery calcification as an indicator of diabetic peripheral vascular disease. Foot Ankle Int 2008;29(2):185-90 doi: 10.3113doi: 10.1016/j.jmii.2018.03.005. 3. Aragon-Sanchez J, Lazaro-Martinez JL. Factors associated with calcification in the pedal arteries in patients with diabetes and neuropathy admitted for foot disease and its clinical significance. Int J Low Extrem Wounds 2013;12(4):252-5 doi: 10.1177/1534734613511636. 4. Carmena-Pantoja M, Alvaro-Afonso FJ, Garcia-Morales E, Garcia-Alvarez Y, Tardaguila-Garcia A, Lazaro-Martinez JL. The Influence of Arterial Calcification on Clinical Outcomes in Patients with Diabetic Foot Ulcer Complicated by Osteomyelitis Treated by Surgery. Int J Low Extrem Wounds 2021:15347346211022587 doi: 10.1177/15347346211022587.