

Introduction

- Atherosclerosis and neuropathy contribute to an increased risk of peripheral vascular disease (PVD) and adverse outcomes, e.g. ulcers, infections, limb amputation, hospitalizations and mortality in people with diabetes mellitus (DM).
- The same risk applies to patients on hemodialysis (HD), caused by uremic neuropathy, arteria media sclerosis and microvascular problems related to secondary hyperparathyroidism (sHPT) and vascular calcifications. Pain and other symptoms are often reduced due to neuropathy resulting in late diagnosis. HD has been described as an independent risk factor for foot ulcers.
- Both the ACC/AHA and K/DOQI guidelines recommend screening of individuals at risk.

Objective

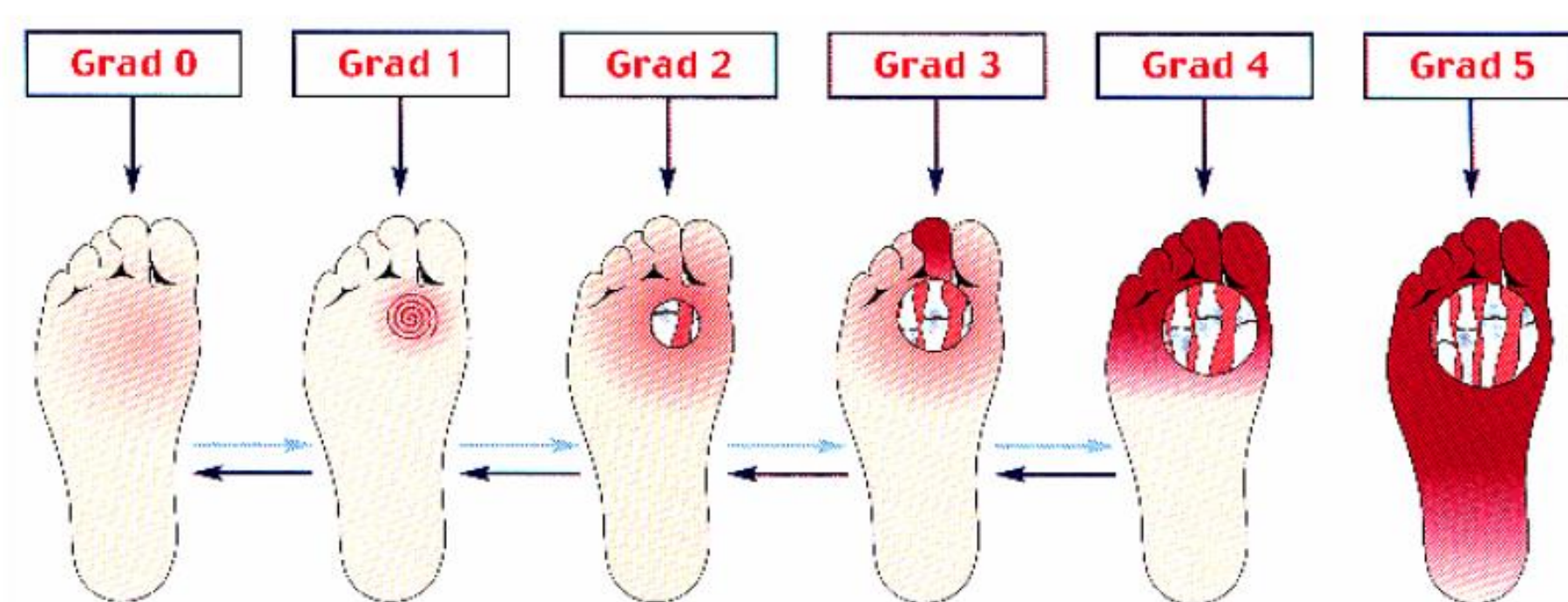
- This study analyzed the frequency of foot complications following implementation of a standardized foot examination in 345 prevalent hemodialysis patients with DM in 12 DaVita centers in Poland (n=8, 177 pts) and Portugal (n=4, 168 pts).
- Hospitalizations and cause-specific mortality were documented during 44 months follow up.

Methods

- The protocol included: history of the patient (ulcers, amputation), inspection of feet (skin, nails) and examination of the pedal pulses (a dorsalis pedis and a tibialis posterior).
- Foot complications were classified according to Wagner (grade 0-5) (Fig 1) and PVD was classified by clinical pulse measurement (normal vs weak or missing).
- We analyzed risks associated with hospitalization and mortality using Cox proportional hazard models.

Standardized foot examination protocol in HD patients with DM is a simple and suitable clinical tool with which to identify patients at high risk of future serious complications.

Fig 1. Wagner Classification of Foot Complications



Grade	Wagner Classification
0	No break in skin
1	Superficial ulcer
2	Exposed tendous joints
3	Exposed bone and/or abscess/osteomyelitis
4	Gangrene of toes or forefoot
5	Midfoot or hindfoot gangrene

Results

- The mean age of patients (58% men) was 70.4 (SD, 14) years.
- A normal pulse in left and right a dorsalis pedis and in left and right a tibialis posterior was found in 17% and 10 %, respectively.
- All other patients had weak or absent pulses.
- The Wagner classification score was 0 or 1 in 88% of patients, 2-3 in 6 % of patients, and 4-5 in 5 % (Fig 2).

Fig 2. Wagner Classification Score

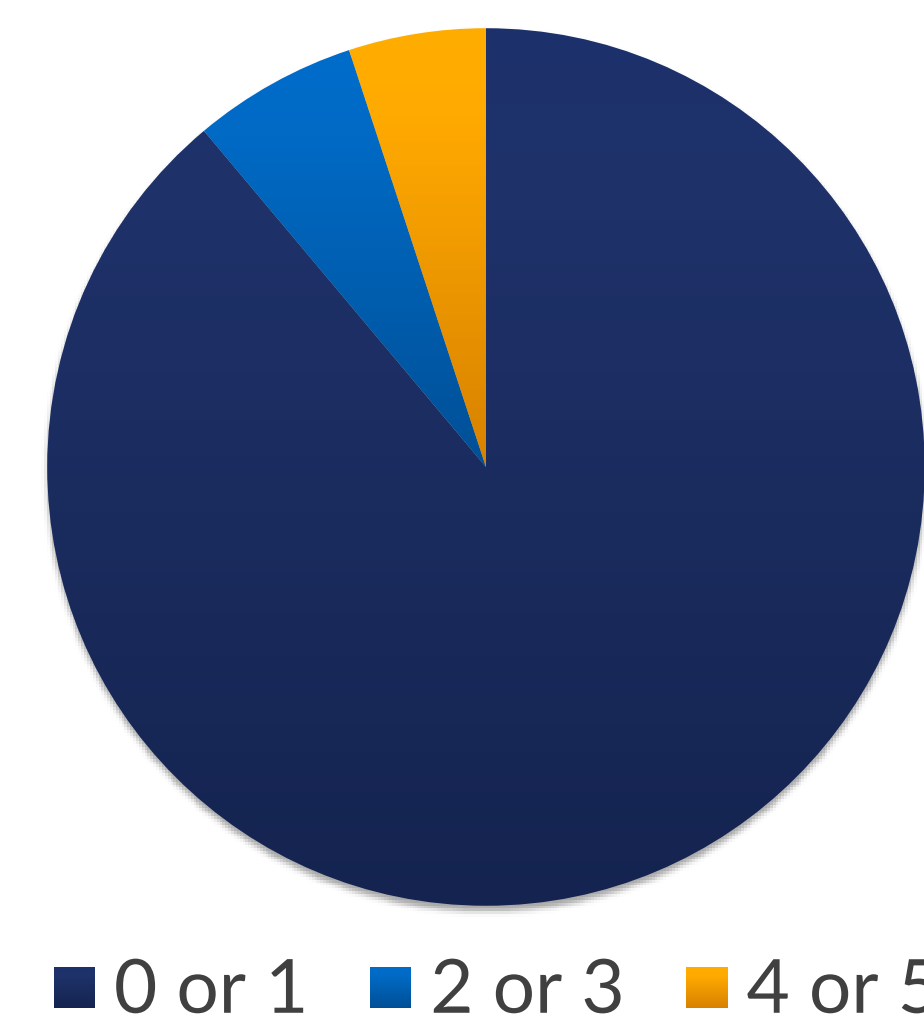
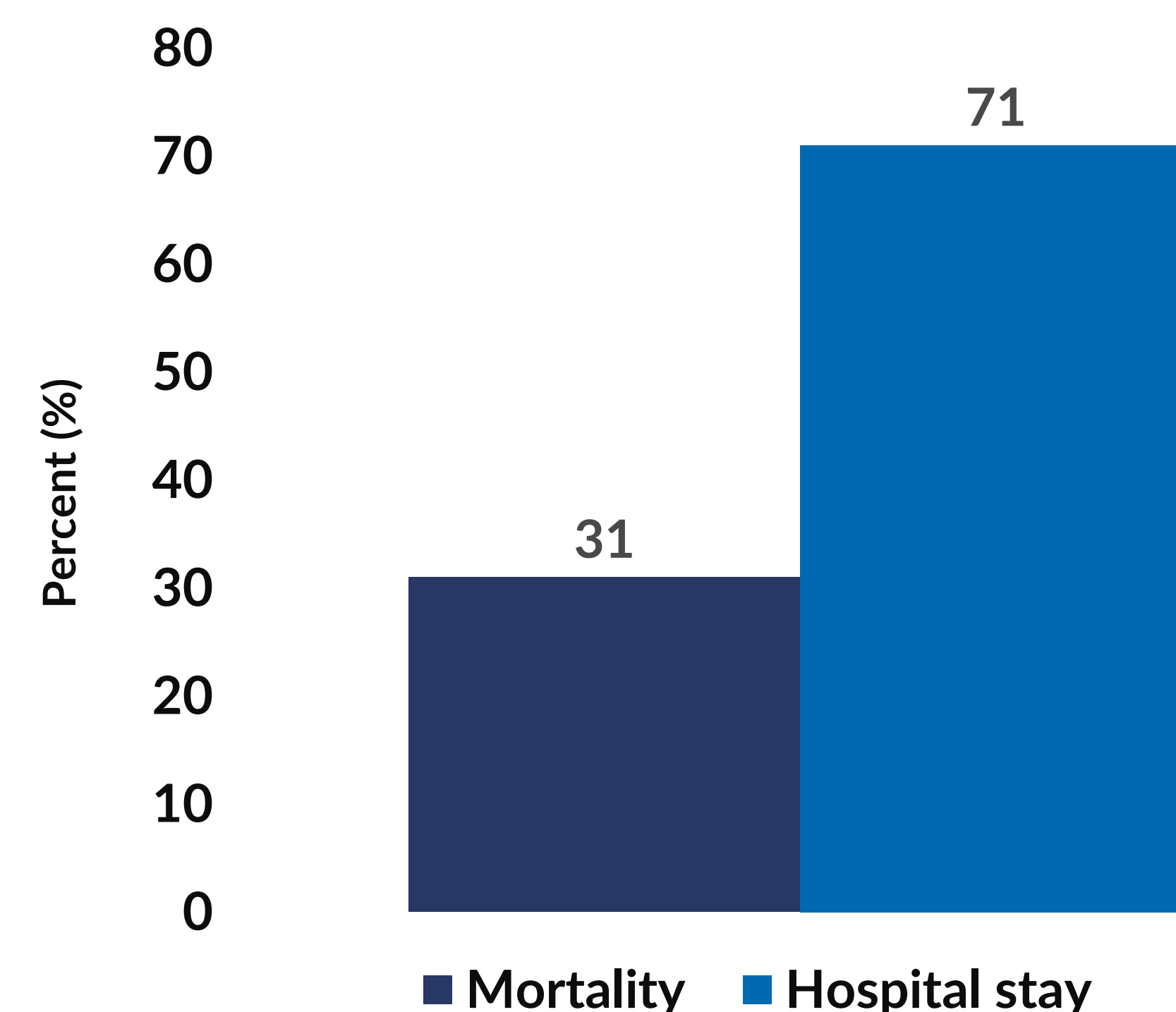


Fig 3. Mortality and Hospitalization (44 months)



- All-cause mortality was 31% during the close to 2-year follow up and 71% of patients had at least one hospital stay (Fig 3).
- Cardio-cerebrovascular, PVD, and infection accounted for 76% of all mortality.
- In unadjusted analyses, presence of weak or absent pulses in a dorsalis pedis was significantly associated with all-cause mortality RR: 2.1 (CI: 1.1-4.3; p<0.05).
- In adjusted models including age, sex, Hb, albumin, Kt/V, vascular access, phosphorus, PTH and Charlson CI, only albumin was associated with mortality (RR: 0.89, CI: 0.84-0.94; p<0.001) and risk of hospitalization (RR: 0.92, CI: 0.89-0.96; p<0.001).

Conclusion

- Implementation of a standardized foot examination protocol in HD patients with DM showed a high prevalence of clinically significant complications that warrant close attention.
- This clinical tool is suitable to identify patients at high risk of future complications and could be the basis of a program to improve overall health outcomes.

References

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Acknowledgments

The authors wish to thank Abigail E. Hunt, PhD, DaVita Clinical Research for assistance in preparing this poster.
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Poster available at www.davitaclinicalresearch.com
American Society of Nephrology Kidney Week, November 5-10, 2019; Washington, DC