EFFECTS OF PERDIALYTIC CYCLING ON THE PERIPHERAL MICROCIRCULATION IN CHRONIC HEMODIALYSIS PATIENTS: PRELIMINARY RESULTS OF **ACTIVDIAL STUDY**

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Background

Chronic kidney failure is associated with a high prevalence of peripheral arterial diseases (PAD). Due to the impairment of the peripheral cutaneous perfusion, PAD lead to wounds, infections then amputations or death. Currently, medical therapies are limited to the stabilization of PAD lesions.

Moreover, due to the established reduced activity in chronic hemodialysis patients, the impact of exercise and lower extremity rehabilitation for PAD is limited. However, many studies have shown clinical benefits of a perdialytic physical activity. To date, no data reports the effects of a perdialytic activity on the leg skin perfusion.

The aim of this pilot prospective study is to investigate the impact on the microcirculation of a three-month perdialytic cycling period with the Letto bike (MOTOmed®).

Materials and Method

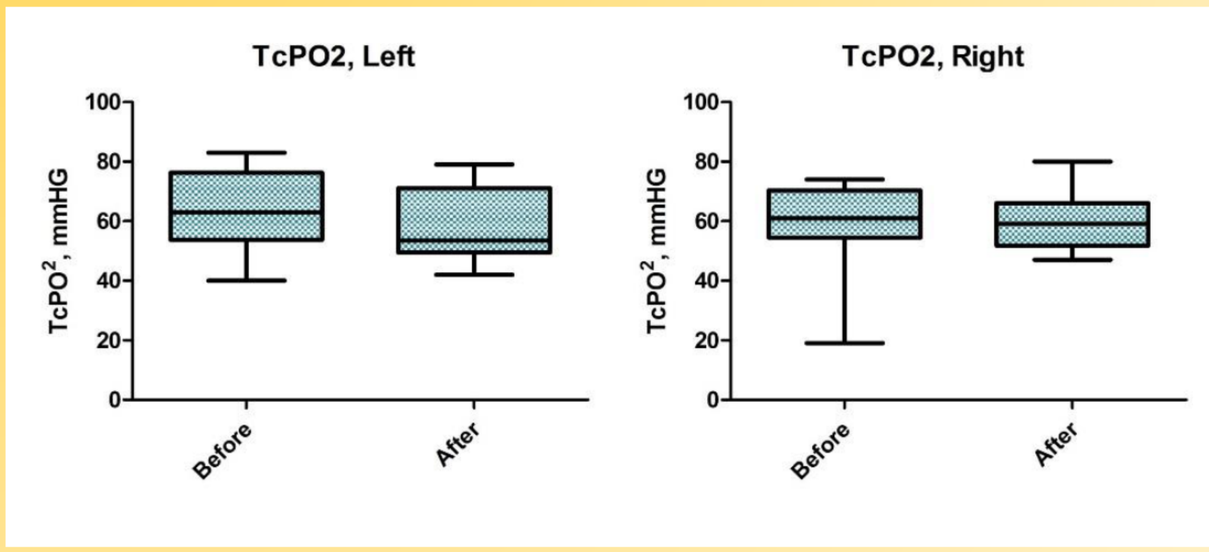
Cycling was performed at each dialysis session, for 30 minutes, 3 times a week. Patients are free to choose the resistance magnitude. The primary outcome is the increase of the cutaneous perfusion, assessed by measuring transcutaneous oxygen pressure (TcPO2).

The secondary outcomes are clinical outcomes: Evolution of blood pressure, heart rate, systolic pressure index, handgrip test, quality of life and biological parameters (nutrition, inflammation and CKD associated bone mineral disorders).

Results

Perdialytic cycling was performed in 10 chronic hemodialysis patients. All of them actively cycled with a good clinical tolerance. Peripheral perfusion was unchanged before and after perdialytic cycling (TcPO2: 63.7±13.6 before and 57.7±12.4 mmHg after; p=0.119 for the left legs and 58.4±16.0 before and 60.1±10.6 mmHg after; p=0.919 for the right legs).

In contrast, results of secondary clinical outcomes tend to confirm published data, such as a decrease of systolic blood pressure and heart rate. Moreover, results of biological assessments show an improvement of plasma calcium (2.13±0.15 before and 2.20±0.14 mmol/L after; p=0.068) and a significant increase of bone alkaline phosphatase (19.6±15.4 before and 27.1±21.0 µg/L after; p=0.018).



Conclusion

Our preliminary results failed to show an improve of microcirculation after 3 month cycling but surprisingly demonstrate a significant increase of bone alkaline phosphatase associated with an increase of plasma calcium after 3 months perdialytic cycling without significant change on microcirculation.

These results suggest a potential beneficial effect of perdialytic cycling on bone mineral disorders.

51ERA-EDTA
479--MP
M) Dialysis. M7) Pathophysiology and clinical studies in CKD 5D patients.
Marine Panaye
DOI: 10.3252/pso.eu.51era.2014
Poster presented at: 51 ERA-EDTA CONGRESS AMSTERDAM 2014
PosterSessionOnline.com