TOE/BRACHIAL INDEX AS A NON INVASIVE TECHNIQUE FOR ASSESSMENT OF PERIPHERAL VASCULAR DISEASE IN END STAGE RENAL DISEASE PATIENTS ON HEMODIALYSIS

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Introduction:

• Cardiovascular disease is common in End Stage Renal Disease (ESRD) patients and is responsible for more than 50% of their deaths. At the same time, renal disease, even at the earliest stages, is a cardiovascular risk factor. Among the different localization of cardiovascular diseases, peripheral arterial disease (PAD) affecting the lower limbs has a higher morbidity. Nevertheless, despite its importance, there are few reports of this pathology in ESRD patients, and most of them, with a few exceptions, have been performed in dialysis patients.

Objectives:

• To detect the prevalence of PAD in patients on maintenance hemodialysis.
• To investigate vascular complications of lower extremities in patients on chronic hemodialysis by measuring the toe/brachial index (TBI).
• To demonstrate whether measuring TBI, makes surveying PAD effective and useful in chronic hemodialysis patients in an outpatient setting.
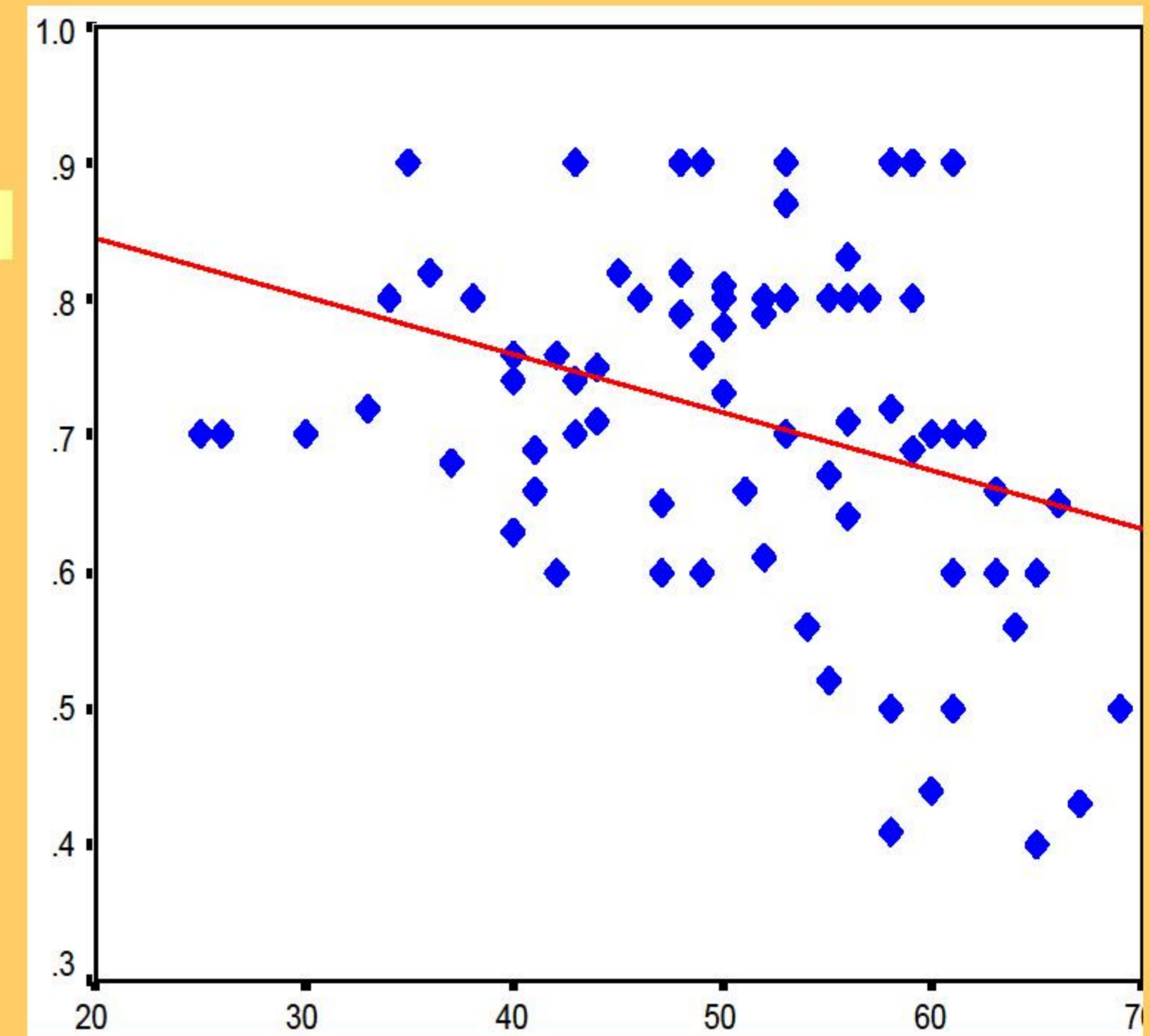
Methods:

• A cross-sectional analysis of a prospective cohort of eighty ESRD patients on regular hemodialysis (42 males, mean age 50.9 9 years). 40 laboratory parameters potentially related to cardiovascular risk, the common carotid artery intima media thickness by carotid duplex and TBI by Doppler ultrasound were prospectively assessed. Patients with bilateral proximal arteriovenous fistula (AVF) have been excluded from the study. Etiology of ESRD was HTN in 26 patients (32.5%), DM in 19 patients (23.8%), Obstructive Uropathy in 14 patients (17.5%), Chronic GN in 6 patients (7%), Vesico-Ureteric Reflux in 6 patients (7%), Lupus nephritis in 7 patients (8.5%), Alport syndrome in 1 patient (2%), and idiopathic in 1 patient (2%).

Results:

The cut off value of TBI was 0.64   0.2 and the prevalence of PAD was 32.5 %.

A univariate analysis showed that:
• TBI had significant negative correlations with Age (p=0.001), Male gender (p=0.009), Hypertension (p=0.0495) and CCA-IMT > 1cm (p=0.0246).
• TBI had a trend towards a negative correlation with serum phosphorus (p=0.0664).
• There were no significant correlations with serum cholesterol, triglycerides, LDL, intact PTH, the dialysis duration or the causes of ESRD other than hypertension.

• A multivariate regression analysis using those variables yielded a model with an r^2 =0.46. Independent predictors of low TBI were advanced Age (p=0.029), Male gender (p=0.0119) and increased CCA-IMT (p=0.0378).

• The contribution of serum phosphorus to the multivariate model was not statistically significant.

TBI (%) / Age (Years)

Best cut off, Sensitivity, specificity, PPV, NPV and accuracy of TBI in prediction of PAD:

Variables	Percent
Best Cut off = 0.7	
Sensitivity	**73 %**
Specificity	**82 %**
Positive Predictive Value	**66 %**
Negative Predictive Value	**86 %**
Accuracy	**78 %**

Conclusions:

1. High prevalence of Peripheral vascular disease in hemodialysis patients (32.5%).

2. The TBI is a non invasive technique replacing invasive arteriography in detection of PVD in hemodialysis patients.

3. TBI is considered better negative test than positive with its higher specificity (82 %) than sensitivity (73 %) and it can be used as a screening method of PAD.

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