

A) BRIEF PAPERS ON RESEARCH AND CLINICAL EXPERIMENTS

Prevalence of chronic kidney disease and arteriosclerosis in a non-selected population. World Kidney Day

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To the Editor,

Chronic kidney disease (CKD) is an important issue for public health, given its high incidence, prevalence, morbidity and mortality, and socio-economic cost.¹

In Spain,² the prevalence of replacement renal therapy is 986 patients per million population (pmp), which means that approximately 45 000 people need extrarenal clearance or have received a kidney transplant. CKD is much more prevalent in earlier stages, and is associated with a poor prognosis, given the increased risk of premature death caused by cardiovascular disorders and the risk of kidney disease progressing. If this were to occur, replacement renal treatment is needed.

The prevalence of CKD at stages 3b and 4 is 1.38%,³ presenting a greater risk of death, cardiovascular disease (CV), CV morbidity and mortality, greater cognitive deterioration and worse quality of life.⁴

CKD treated at early stages progresses to a lesser extent and presents with less CV complications. Therefore, the public health system should advocate for an early CKD detection and treatment.

We saw World Kidney Day (WKD) as the perfect opportunity to assess CKD prevalence and its associated vascular risk in a non-selected population in the Galician city, Ourense.

We spontaneously studied a non-selected population that attended the WKD marquee in the city centre. The following measurements were taken: anthropometrics, blood pressure (Omron®), glucose (Reflotron®) and creatinine (Reflotron®) rates, intima-media thickness (IMT) measured by ultrasound of the supra-aortic trunks (LOGIQ, 12MHz probe), taken from the posterior wall and from an area free from atheromatous plaques. An arteriosclerosis score was used (AS): AS 1: ITM<0.8; AS 2: ITM>0.8; AS 3: ITM>>0.8 with plaques.

Statistical calculations included mean, standard deviation and the Pearson's regression.

We obtained the following results: 82 people came to the marquee, 75 men (69.66 years) and 7 women (67.28 years), see Table 1. Average MDRD

was 109.38 (12.4-180), the percentage of MDRD<60ml/min was 11.9%, and the different degrees of arteriosclerosis are shown in Table 2. AS correlated with age (0.000), kidney function (0.015), pulse pressure (0.044) and BMI (0.069).

When the glomerular filtration rate (GFR) is lower than 50ml/min, inflammatory response to endothelial dysfunction (ED) is initiated, the latter being a precursor of the atherothrombotic/arteriosclerotic process. It is initiated by an increase in adhesion molecule expression, monocyte infiltration, and their activation and transformation into macrophages. When the eGFR is lower than 30ml/min, phosphorus (P) 'retention' is produced and fibroblast growth factor (FGF 23) activated. Through its specific binding with a receptor and Klotho, it does not only reduce the kidney's P

Table 1. Descriptive

Variable	Mean	Confidence interval
Age	69.46	47-87
BMI	28.78	19.53-28.78
SBP	148.85	90-230
DBP	76.97	45-105
ABP	136.67	73.33-101.09
PP	72.34	25-145
MDRD	109.38	12.41-180.28

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; ABP: average blood pressure; PP: pulse pressure; MDRD: Modification of diet in renal disease

Table 2.

	AS1	AS2	AS3	Correlation	P
Age	62.39	70.86	74.44	0.503	0.000
MDRD	127.75	101.96	104.30	-0.271	0.015
SBP	146.78	145.66	155.55	0.157	0.165
DBP	80.68	74.16	76.29	-0.131	0.250
PP	67.72	71.50	79.25	0.228	0.044
ABP	103.25	98.00	102.71	-0.004	0.969
BMI	27.30	24.46	29.38	0.214	0.069

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; ABP: average blood pressure; PP: pulse pressure; MDRD: Modification of diet in renal disease

absorption, it also inhibits 1-alpha-hydroxylase and results in lower calcitriol synthesis.

CKD progression, the decrease in FGF 23's phosphaturic action and lower vitamin D rate produce a situation of resistance to FGF 23's phosphaturic action. As a result, the P's plasmatic rate increases, which upregulates the gene that codes for PTH through a "P sensor" in the parathyroid glands. Furthermore, in this hyperphosphataemia situation, extracellular P is transported by the co-transporter Pit-1 to the intracellular compartments, and once there, it acts as an indicator of an increase in mineral nucleation expression agents.⁵

Deficiency in vitamin D contributes to this process, given that Th1 lymphocyte action cannot be inhibited, which continue activating and perpetuating the ED process.

To conclude, there is a high prevalence of CKD in a non-selected and spontaneous population. Arteriosclerotic disease is not only related to kidney function, but also to age and pulse pressure. Pathogenic mechanisms are well known, meaning that a change is needed. Nephrology departments, in collaboration with primary care centres should create programmes for detecting CKD and incipient vascular lesions early, so as to reduce CKD progression and cardiovascular morbidity and mortality.

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Monitoring sirolimus levels: How does it affect the immunoassay used?

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To the Editor,

Sirolimus, an immunosuppressive agent used to prevent graft rejection, has a narrow therapeutic window and high interindividual and intraindividual variability. Its concentration in blood must be monitored to prevent graft rejection and some adverse effects.¹ To date, the microparticle immunoassay (MEIA, Abbott Laboratories[®]) on an IMx[®] analyser has been the most used method for measuring sirolimus concentrations in blood.²⁻⁶ However, the 2010 Abbott Laboratories[®] stopped marketing the reagents for this technique, replacing them with a chemiluminescent microparticle immunoassay (CMIA) on the Architect[®] analyser. Different immunoassays do not always yield the same results, given that techniques can have different sample pretreatments, drug metabolite cross-reactivity, or quantification limits.

The aim of our study was to compare sirolimus limits in kidney transplant patients, obtained by analysing the same blood sample with the two immunoassays (IMx[®] and Architect[®]). The sirolimus concentration analysis includ-

ed the samples received at Del Mar Hospital during the first half of 2010 (period in which both reagents were available). We analysed 21 samples from 13 kidney transplant patients (10 men, age: 57.5 years [SD=12.4], post-transplant time: 5.25 years [Q1-Q3=4.13-9.44]).

Average concentrations obtained were 4.98ng/ml (SD=2.14) for IMx[®] and 8.37ng/ml (SD=3.01) for Architect[®]. The mean absolute difference between the techniques was +3.39ng/ml (SD=1.76) for Architect[®] compared to IMx[®].

The Bland-Altman graph in Figure 1 shows the differences between the two techniques. Figure 2 shows the correlation of least squares between both techniques. The Pearson's correlation coefficient was r=0.819.

For 13 of the 21 samples, the difference between the two techniques was more than 50%, especially for samples less than 5ng/ml (9/11 compared to 4/10; P=.080).

Two of the samples analysed by IMx[®] (9.5%) were below their quantification limit (QL: 2.5ng/ml), while this was not found for the Architect[®]-analysed samples (QL: 0.7ng/ml).

For the IMx[®]-analysed samples, 47.6% (10/21) were within the therapeutic window (5-15ng/ml), the remaining 52.4% (11/21) were at an infra-therapeutic level. However, of the Architect[®]-analysed samples, 76.2% (16/21) were within the therapeutic window, 19.0% (4/21) were at an infra-therapeutic level and 4.8% (1/21) at a supra-therapeutic level.

Various immunoassays have been developed, making immunosuppressive drug monitoring easier.^{7,8} Immunoassays use reagents with monoclonal antibodies against the drug analysed. Depending on the antibody's specificity, cross-reactivity may exist with the drug's metabolites. This cross-reactivity varies for each technique, giving rise