PERFORMANCE OF DIFFERENT GFR ESTIMATION FORMULAS IN AN ADULT POPULATION OF THE QOM ETHNIC GROUP IN THE CITY OF RESISTENCIA, CHACO, ARGENTINA

WCN24-AB-969

Keywords

GFRe formula

Performance different equations

GFR equations

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Introduction

Cronic Kidney Disease (CKD) is recognized as a true public health problem. The International Guides and recently the SLANH-Colabiocli Commission recommend informing the GFR as a fundamental tool for the detection of CKD . Various formulas have been developed, but for laboratory implementation, it is essential to validate the formula for the local population (other than the one developed). A valid formula will have a low bias in general and in subgroups and a high precision.
In this study, the performance of MDRD, CKD-Epi 2021 (without race), CKD EPI through web calculators, and MDRD calculated by the Laboratory's Computer System will be evaluated. Serum Creatinine was obtained from a sample of an adult population of the QOM ethnic group of the city of Resistencia, Chaco, Argentina.

Methods

The study population was made up of 430 adult individuals from the QOM ethnic group of the city of Resistencia. Average age 37 years (Rank 18-80). Female 63.6% and Male 36.4%. The prevalence of HT was 26.1% and Diabetes 2.6%; Normal Weight 30.3%, Overweight 32.6%, Obese 34.7% and Low Weight 2.4%. In this study, Creatinine-based Formulas, Standardized Jaffé Method to Reference Method (IDMS NIST) were evaluated. TFG values were obtained using web calculators (CKD-epi 2021, CKD-epi 2009 and MDRD) and MDRD obtained by the Computer System used in the laboratory (SIL LabCore Holding AG © 2015). The GFR estimated by formula CKD-Epi 2009 was considered the Gold Standard. To evaluate the performance of the different formulas, bias, precision and accuracy of each of them were determined. For statistical analysis, Epi Info Software version 7.25.0 and IBM SPSS Statistic-25 were used.

Results

Precision and Accuracy values for the MDRD, CKD-Epi 2021, and MDRD formulas (Laboratory Computer System) are presented in Table 1.

Table 1: Performance of Creatinine-based equations

Fórmula	n	BIAS		Precision		Accuracy	
		Median of the difference (IC95%) ml/min/1.73 m²	Median of % (IC95%)	Interquartile range of difference ml/min/1.73 m²	Interquartile range of the percentage (%)	P30	RMSE
CKD Epi 2021	430	-3,00 (-2,98—3,77)	-1,03 (-1,06--1,11)	1,8	0,28	94,00	6,19
MDRD	430	6,07 (3,35-5,18)	6,33 (3,39- 4,70)	6,72	6,52	84,90	7,62
MDRD (SIL)	430	10,70 (8,52-10,20)	11,41 (8,50- 10,23)	8,62	7,74	80,53	11,07
CKD Epi 2009 Gold Estándar						**89,9**	
		Note 1				**Note 2**	

Note 1: Represents the systematic error of the formula used with respect to the Gold Standard (both in ml / min / 1.73 m2 and in percentage);

Note 2: P30, percentage of TFG estimated within 30% of the Gold Standard; RMSE, mean quadratic error;

Conclusions

Considering that the main limitations of estimation equations are Accuracy in some groups and lack of general precision, the observed differences indicate that the CKD Epi 2021 formula achieves a better level of performance than the MDRD or CKD Epi 2009.

No potential conflict of interest to disclose.