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TABLE OF CONTENTS

GENERAL INFORMATION	IC
INFORMATION FOR AUTHORS	1F
EDITORIAL NOTE: <i>Growth Hormone: Its Physiology, Plethora Of Uses and Misuse</i>	775
ORIGINAL ARTICLES	
First Cases of Sars-cov-2 Reinfection Coinciding with the Covid-19 Second Wave, Benin City, Nigeria	777
B.U. Okwara, I.I. Osaigbovo, E.O. Ogboghodo, F. Adio, E. Oduware, D.E. Obaseki, D. Asamah	
Fatal Spontaneous Subarachnoid Haemorrhage- A Report of Three Unusual Causes	781
O.A. Badejo, M.T. Shokunbi	
Audit of Stroke Admissions in a Tertiary Hospital in South East Nigeria	788
B.A. Ezeala-Adikaibe, U.H. Okafor, C.C. Okwara, E. Iwuozo, F. Ekochin, N. Mbadiwe, P. Chime, T. Okpara, T. Nnaji, M. Nwobodo, M. Ezeme	
Comparative Evaluation of Creatinine and Cystatin C Derived Glomerular Filtration Rate Methods in Hiv Patients on Therapy and Healthy Controls	795
C.C. Nganwuchi, A.J. Onuegbu, M.J. Olisekodiaka, J.E. Okwara, U.K. Amah, O.C. Okamgba, S. A. Offiah	
Predictors of Satisfaction with Wound Care Services in an Outpatient Setting in Kano, Nigeria	800
G.C. Michael, B.A. Grema, A.O. Ashimi, A.L. Olawumi, Z.A. Umar, Z. Mahmoud, S.A. Aji	
Marginal Traction Alopecia: Hair Care Practices, Severity Score and Trichoscopic Features in Lagos, Nigeria	808
E.L. Anaba, E.O. Akinkugbe, E. Otofrowei, O. Adeife-Cole, O. Ayanlowo, I. Oaku, I. Akwara	
A Method of Conservative Management of Giant Omphalocele Useful in Preventing Rupture of Sac	816
H.K. Odion-Obomhense, N.S. Awunor, U. Onyeaso	
Surgical Glove Perforation and Percutaneous Injury during Intermaxillary Fixation with 0.5 Mm Stainless Steel Wire	823
T.E. Osodin, O.A. Akadiri, V.I. Akinmoladun, A.O. Fasola, A.A. Olaitan	
Keloids in Darkly Pigmented Skin: Clinical Pattern and Presentation at a Tertiary Health Facility, Southwest Nigeria	829
A.G. Alo, A.O. Akinboro, A.A. Ajani, F.O. Olanrewaju, M.M. Oripelaye, O.A. Olasode	
Prevalence and Pattern of Alcoholic Beverage Consumption among Undergraduates in Remo, Ogun State, Southwest, Nigeria	836
O.O. Sholeye, Z.T. Alimi, O.A. Jeminusi, A.A. Gbadebo, A. Akinpelu	
Cardiovascular Findings in Adult Patients with Sickle Cell Anaemia in Steady State seen in Calabar, Nigeria	844
V.O. Ansa, M.A. Inyama, E.A. Mpama, V.M. Uhegbu, A. Otu, I. Ukpeh, D.S. Otu, C. Akpan, U. Njideoffor, C. Onwurah	
Cash Transfers may Increase the No-show Rate for Surgical Patients in Low-resource Settings: A Randomized Controlled Trial	852
M.G. Shrime, E.A. Harter, B. Handforth, C.L. Phillips, W.C. Hendrika, M. Hamer, D. Alcorn, T. Bennette, E.F. Millimouno, J. Nieba, B.A. Oumar, K.M. Zogbe	
CASE REPORT	
Female Genital Schistosomiasis (FGS) Associated with Well-Differentiated Squamous Cell Carcinoma of the Vulva: A Case Report	859
R. Ibrahim, H.U. Farouk, A.I. Lawan, Y.M. Abdullahi	
Isolated Hepatic Sarcoidosis: A Case Report and Literature Review	862
S.C. Egbob, E. Ray-Offor, C.C. Obiorah	
REVIEW ARTICLE	
Growth Hormone Deficiency: Navigating the Terrain of Diagnosis and Treatment in Sub-Saharan Africa	867
I.J. Akinola, A.U. Solarin, R.K. Henry	
Neurobiological Underpinnings in Drug Addiction	874
C.N.S. Nwonu, P.C. Nwonu and R.A. Ude	
INDEX TO VOLUME 39, NO. 8, 2022	
Author Index	885
Subject Index	886



Comparative Evaluation of Creatinine and Cystatin C Derived Glomerular Filtration Rate Methods in Hiv Patients on Therapy and Healthy Controls *Évaluation Comparative Des Méthodes De Calcul Du Débit De Filtration Glomérulaire Dérivé De La Créatinine Et De La Cystatine C Chez Des Patients VIH Sous Traitement Et Des Témoins Sains*

^{1*}C.C. Nganwuchi, ²A.J. Onuegbu, ²M.J. Olisekodiaka, ²J.E. Okwara, ²U.K. Amah, ¹O.C. Okamgba, ¹S. A. Offiah

ABSTRACT

BACKGROUND: Antiretroviral drugs are associated with adverse effects including chronic kidney disease. The onset of chronic kidney disease manifests with mild reduction in GFR. Early detection of chronic kidney disease is integral component of clinical medicine with major effect on disease labeling, intervention and drug dosing.

METHODS: We determined the serum creatinine and cystatin-c levels of 55 HIV patients on one year ART, 55 HIV patients on three years ART and 54 apparently healthy controls using colorimetric and immunoturbidimetric methods respectively. Glomerular filtration rates (GFRs) were calculated from serum creatinine and cystatin-c levels with Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equations.

RESULTS: The mean±SD GFR derived from serum creatinine (ml/min/1.73m²) were 110.55±14.34, 106.35±19.25 and 121.63±13.88 for HIV patients on one year, three years ART and healthy controls respectively. GFR derived from cystatin-c (ml/min/1.73m²) were 90.96±13.53, 87.27±14.16 and 108.61±12.07 for HIV patients on one year, three years ART and healthy subjects respectively. GFR_{creat} was higher when compared with GFR_{cyst} in each group (p=0.01). No significant association was seen between body mass index (BMI) and GFR_{cyst} in patients (p= 0.720) and controls (p=0.760). Binary logistic regression analysis for sensitivity between patients and controls showed odd ratios (0.95 and 1.03) for GFR_{creat} and (1.04 and 0.99) for GFR_{cyst} in group 1 and 2 respectively.

CONCLUSION: Rather than creatinine, GFR derived from serum cystatin-c might be an ideal renal function estimate for this population of Nigerians for sensitivity and non dependence on age and BMI.

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KEYWORDS: ART, Creatinine, Cystatin-c, GFR, HIV.

RÉSUMÉ

CONTEXTE: Les médicaments antirétroviraux sont associés à des effets indésirables dont la maladie rénale chronique. L'apparition de la maladie rénale chronique se manifeste par une légère réduction du DFG. La détection précoce de la maladie rénale chronique fait partie intégrante de la médecine clinique et a un effet majeur sur l'étiquetage de la maladie, l'intervention et le dosage des médicaments.

MÉTHODES: Nous avons déterminé les taux de créatinine et de cystatine-c sériques de 55 patients VIH sous traitement antirétroviral pendant un an, 55 patients VIH sous traitement antirétroviral pendant trois ans et 54 témoins apparemment sains, en utilisant respectivement les méthodes colorimétrique et méthodes colorimétriques et immunoturbidimétriques respectivement. Les taux de filtration glomérulaire (GFR) ont été calculés à partir des taux de créatinine sérique et de cystatine-c avec les équations de la Collaboration pour l'épidémiologie de la maladie rénale chronique (CKD-EPI).

RÉSULTATS: Le DFG moyen±SD dérivé de la créatinine sérique (ml/min/1,73m²) étaient de 110,55±14,34, 106,35±19,25 et 121,63±13,88 pour les patients séropositifs sous TAR d'un an, de trois ans et les contrôles sains respectivement. Le DFG dérivé de la cystatine-c (ml/min/1,73m²) étaient de 90,96±13,53, 87,27±14,16 et 108,61±12,07 pour les patients séropositifs sous TAR d'un an, de trois ans et les sujets sains respectivement. Le DFG_{creat} était plus élevé que le DFG_{cyst} dans chaque groupe (p=0,01). Aucune association significative n'a été observée entre l'indice de masse corporelle (IMC) et le DFG_{cyst} chez les patients (p=0,720) et les contrôles (p=0,760). L'analyse de régression logistique binaire pour la sensibilité entre les patients et les contrôles a montré des rapports impairs (0,95 et 1,03) pour le GFR_{creat} et (1,04 et 0,99) pour GFR_{cyst} dans les groupes 1 et 2, respectivement.

CONCLUSION: Le DFG dérivé de la cystatine-c sérique, plutôt que de la créatinine, pourrait être une mesure idéale du DFG. cystatine-c sérique pourrait être une estimation idéale de la fonction rénale pour cette population de Nigériens en termes de sensibilité et de non dépendance à l'âge et à l'IMC. WAJM 2022; 39(8): 795-799.

MOTS CLÉS: ART, Créatinine, Cystatine-c, DFG, VIH

¹Department of Pathology, Abia State University, Aba Campus.

²Department of Chemical Pathology, Nnamdi Azikiwe University, Nnewi Campus.

Correspondence: C.C. Nganwuchi, Department of Pathology, Abia State University, Aba Campus. Email: cajetannganwuchi@gmail.com

Abbreviations: AIDS- Acquired immune deficiency syndrome; ANOVA- Analysis of variance; ART- Antiretroviral therapy; CKD- Chronic kidney disease; CKD-EPI- Chronic Kidney Disease Epidemiology Collaboration; GFR- Glomerular filtration rate; GFR_{creat}- Glomerular filtration rate derived from serum creatinine; GFR_{cyst}- Glomerular filtration rate derived from serum cystatin-c; HAART- Highly active antiretroviral therapy; HIV- Human immunodeficiency virus; HIVAN- Human immunodeficiency associated nephropathy; KDIGO- Kidney Disease Improving Global Outcome; NKF- National Kidney Foundation; NKF-KDOQI- National Kidney Foundation Kidney Disease outcome Quality Initiative; OR- Odd Ratio; ROC- Receiver operator characteristics curve