ORIGINAL ARTICLE

PATHOMORPHOLOGICAL CHARACTERISTICS OF IMMUNOCOMPLEX RENAL DISEASE IN PATIENTS WITH IMMUNODEFICIENCY VIRUS AND HEPATITIS C VIRUS, RECEIVING ANTIRETROVIRAL THERAPY

DOI: 10.36740/WLek202107102

Anna I. Gorodetska[1,2], Olena O. Dyadyk[2], Mariia D. Ivanova[2], Nana M. Pasiyeshvili[3]

[1]KIEV CITY CLINICAL HOSPITAL № 5, KYIV, UKRAINE

[2]SHUPYK NATIONAL HEALTHCARE UNIVERSITY OF UKRAINE, KYIV, UKRAINE

[3]PUBLIC NONPROFIT ORGANIZATION OF THE KHARKIV DISTRICT COUNCIL «REGIONAL CLINICAL PERINATAL CENTRE», KHARKIV, UKRAINE

ABSTRACT

The aim is to verify and describe the morphological substrate of renal impairment in HIV/HCV co-infection among patients receiving ART to assess and predict the morphogenesis of immunocomplex lesions.

Materials and methods: To assess and predict the morphogenesis of immunocomplex renal disease, we examined retrospectively the kidney tissue samples of 15 patients, who died with HIV/HCV co-infection and received ART. Histological, histochemical and immunohistochemical research methods were used.

Results: Segmental and diffuse mesangial proliferation with extracellular matrix expansion with glomerular damage ≥50% in 9 (60%) cases, and involving <50% of glomeruli in 5 (33%), with CD68 expression as single cells were detected. In 12 (80%) cases, there was uneven swelling and focal proliferation of endothelial cells with the involvement of 20-50% of the glomeruli, as well as the presence of cellular infiltrates in the lumen of capillary loops in 3 (20%) cases with monomorphic intensity in "+". Sclerotic changes were present in various degrees of severity – from cases of complete glomerulosclerosis with obliteration of the Bowman's lumen to focal and microfocal depressions 8 (55%), sclerosis 10 (66%), hyalinosis 1 (6%), uneven thickening, focal cleft 8 (55%) and perihilar focal sclerosis. These areas were positive for IgG and C1q complement fractions within the "+", "++" intensity. Among the study group, no case of HIV-associated nephropathy was found that coincided with the predicted spectrum of kidney damage for patients in this sample. The described morphological changes were mainly verified as immuno-mediated by HCV.

Conclusions: A comprehensive morphological study revealed the morphological substrate of kidney damage and its morphogenesis in patients with HIV/HCV co-infection, receiving ART.

KEY WORDS: immunodeficiency virus, viral hepatitis C, kidney, morphology, morphogenesis

Wiad Lek. 2021;74(7):1552-1558

INTRODUCTION

There are more than 30 million people living with the human HIV worldwide. With effective ART, progression to acquired immunodeficiency syndrome (AIDS) is less common, while morbidity and mortality is associated with complications not related to the development of AIDS, including various forms of kidney disease [1]. HIV and HCV are involved in the pathogenesis of specific glomerular diseases. HIV/HCV co-infection has been shown to be associated with a significantly increased risk of kidney disease, but the morphological substrate and stages of morphogenesis contain many unresolved issues [2, 3]. Both viruses are associated with immune dysregulation, which can contribute to the development of comorbid kidney disease. In addition, complex antiviral treatment regimens for HIV and HCV often include drugs with nephrotoxic potential [1, 2].

The two most common forms of HIV-related kidney damage are collapsing glomerulopathy and circulating immunoglobulins related glomerulonephrites, collectively known as HIV-immunocomplex kidney diseases (HIV-ICKD). HIV-associated nephropathy (HIV-AN) was the first kidney disease to be described in HIV-infected people, but is rare among cohort of patients receiving ART. HIV-AN is classically associated with rapid progression to end-stage renal disease, occurs in the late stages of HIV infection, predominantly in the African population, accounting for up to 90% of HIV-related cases of chronic kidney disease (CKD) [4]. HIV-AN is mostly found in people primary diagnosed with the end-stage HIV and may have the first manifestation as acute renal failure or progressive CKD. In addition to HIV-AN, the spectrum of kidney diseases among HIV-infected patients includes immunocomplex kidney disease and, less commonly, thrombotic microangiopathy. HIV-AN has a known morphological substrate – a collaptoid form of focal-segmental glomerulosclerosis in combination with cystic dilatation of the tubules. According to theories of pathogenesis, the