Prognostic relevance of lymphocyte-CRP ratio and CRP-albumin ratio as markers of inflammation in hospitalised adults with HIV

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Background: Amid the COVID Pandemic, lymphocyte-to-C-reactive protein (LCR) and C-reactive protein-to-albumin (CAR) ratios have generated interest as novel biomarkers of inflammation. Despite advances in our understanding of HIV infection, there remains a need for accessible biomarkers of systemic inflammation, which may be predictive of morbidity and mortality for people with HIV (PWH). We sought to evaluate the frequency of abnormal LCR or CAR on hospital admission, and their association with clinical outcomes, in hospitalised PWH at a large HIV tertiary centre.
Method: This retrospective audit included PWH (≥18 years) admitted to the Royal Free Hospital, London between 2015–2017. An existing database, preceding the COVID pandemic, was used to extract baseline demographics, antiretroviral therapy (ART) status, diagnosis on discharge from hospital (categorised as: infectious, malignant, cardiovascular, inflammatory, or other) and clinical outcomes including intensive care unit (ICU) admission and mortality at three months post-discharge. Abnormal LCR was defined as reduced: <101, abnormal CAR as elevated: >0.033; with a sensitivity analysis using a different CAR cut-off: >0.19. Outcomes (ICU admission and mortality) were compared using two-tailed Fisher's exact tests.
Results: 259 patients were included. Most were male (*n* = 188; 73%), with a median age of 47 years (interquartile-range: 41–54). Most patients (*n* = 152; 59%) had a reduced LCR and (*n* = 233; 90%) had an elevated CAR on admission to hospital. Eight patients died; all had elevated CAR and seven had reduced LCR. Of those admitted to ICU (*n* = 5; 2%), four had both elevated CAR and reduced LCR. The proportion of PWH with reduced/normal LCR and elevated/normal CAR were similarly distributed, irrespective of viral suppression or immune reconstitution (Figure 1). There was no significant association between reduced LCR or elevated CAR and ICU admission (*P* = 0.65 vs. *P* = 0.41) or mortality (*P* = 0.15 vs. *P* = 1.0), by contrast with studies in the general population.
Conclusion: On admission to hospital most PWH, regardless of virological control, had reduced LCR or elevated CAR and neither appeared to associate with specific diagnoses or clinical outcomes. Future work will need to evaluate use of these novel biomarkers in this patient population and establish cut-off values for hospitalised PWH that associate with adverse clinical outcomes.