

Neutrophil to Lymphocyte Ratio, White Blood Cell Count, and Ferritin Are Not Validated Surrogates for Inflammation in End-Stage Renal Disease Patient

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INTRODUCTION

Despite the fact that patients on dialysis have significant amounts of inflammation, the gold standard test for assessing inflammation, monitoring C reactive protein (CRP) levels, is not routinely monitored. As a result, epidemiologic studies have attempted to use surrogates such as Neutrophil to Lymphocyte ratio (NLR), white blood cell count (WBC) and ferritin. To date, these surrogates have not been validated but continue to be widely used in analyses. Using a large US dialysis provider's database, we sought to complete this validation.

METHODOLOGY

- CRP values from 4,565 dialysis patient samples collected between 2008 and 2009 were correlated with same day NLR, absolute WBC count and ferritin.
- We retrieved the latest assigned modality for each patient.
- Pearson's correlation coefficient was calculated for each variable with CRP.

RESULTS

Table 1. Patients Demographics

	Mean ± SD
Patients	1,880
Patient samples	4,565
Age (yr)	60.6 ± 15.5
% Male	53.0%
<i>Race and Ethnicity</i>	
% African American	30.2%
% Hispanic	16.0%
% Asian, Pacific Islander	2.7%
% Native American	1.0%
% Unknown	0.1%
% Diabetic	76.0%
Vintage (yr)	3.1 ± 3.4
BMI	27.2 ± 7.1

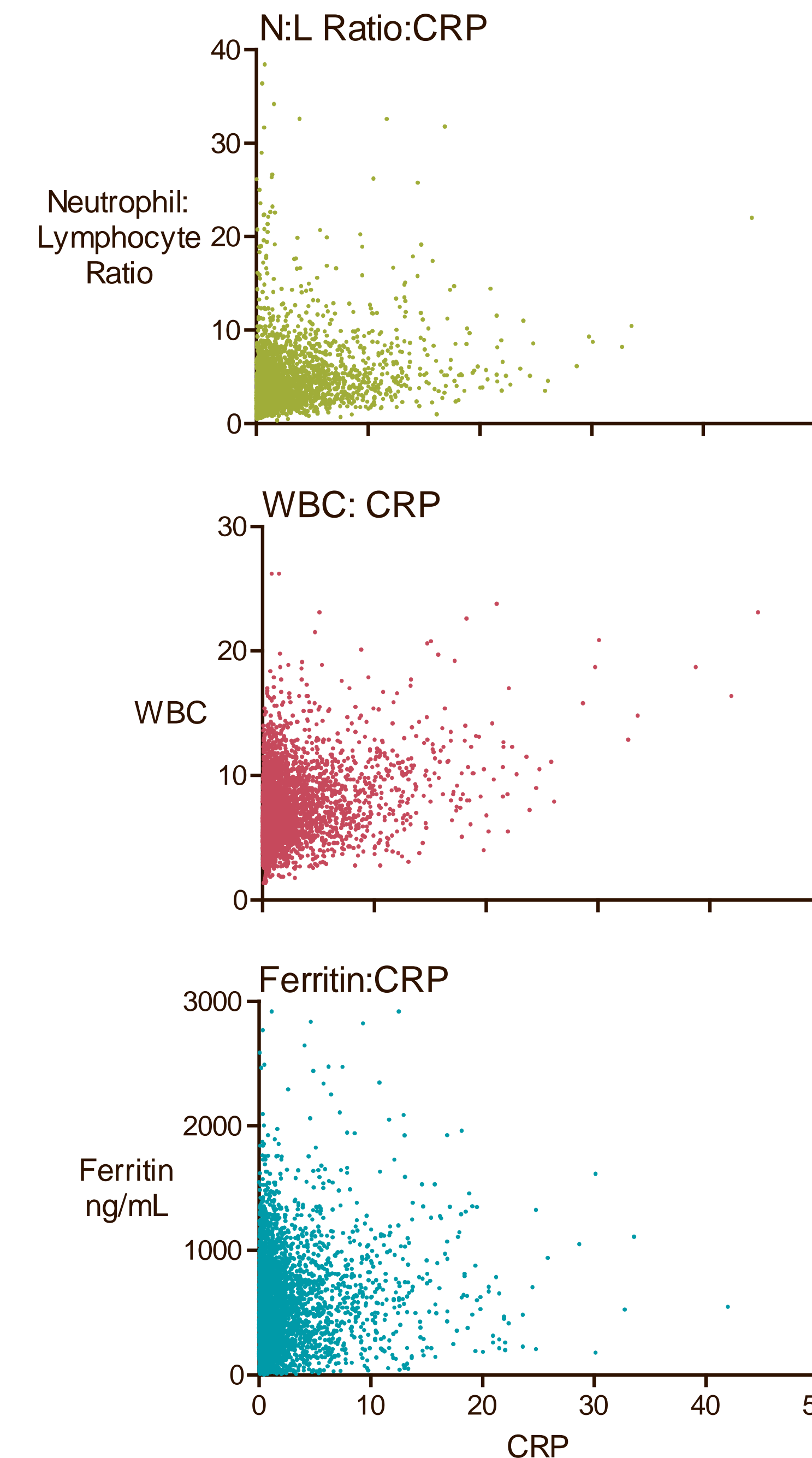


Figure 1. CRP Values by Neutrophil:Lymphocyte Ratio, White Blood Cell Count or Ferritin

SUMMARY of RESULTS

- CRP values were not highly predictive of the following parameters (Figure 1):
 - Neutrophil:Lymphocyte ratio ($r^2 = 0.07$),
 - WBC ($r^2 = 0.10$) or
 - ferritin ($r^2 = 0.02$).

KEY LEARNINGS

- ✓ NLR, WBC and ferritin were not validated as surrogates for inflammation (compared to CRP values) in a large number of ESRD patient samples.
- ✓ These values should not be used to adjust for inflammation in prospective or retrospective studies in dialysis patients.
- ✓ Further work should be done to find better surrogates for inflammation in ESRD patients until CRP or similar testing is more routinely performed.

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