Comparative Diagnostic Utility of Mean Corpuscular Volume and Serum Ferritin in Iron Deficiency Anemia: A Cross-Sectional Study in a Saudi Population

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ABSTRACT

The study seeks to evaluate comparative diagnostic utility of iron deficiency biomarkers, MCV and serum ferritin in relation to Saudi context and the impact of demographic factors on the diagnostic accuracy of these parameters. This study employs a cross-sectional study design using clinical patient data from a gastroenterology center in Riyad Saudi Arabia. 210 participants were selected using a strict inclusion criterion, patients with confirmed diagnosis of IDA at hemoglobin (Hb) levels below 12 g/dL and serum ferritin concentrations under 100 ng/mL and patients with any confounding chronic or inflammatory condition were excluded. SPSS was used for data analysis using descriptive statistics and inferential statistics.The study was conducted at gastroenterology center in Riyad Saudi Arabia, with data collected from July 2022 and July 2023. Findings revealed an inverse correlation between MCV and ferritin ($r = -0.337$, $p < 0.001$) along with MCV showing an inverse correlation against Hb ($r = -0.487$). Females were found to have decreased ferritin levels ($r = -0.460$, $p < 0.001$), however, ferritin levels were seen significantly increased with age ($r = 0.182$, $p< 0.008$). Additionally, 35.4% of the sample population reported using PPI which potentially increases IDA risk. The study demonstrates MCV and ferritin to be critical but not definitive biomarkers for IDA in Saudi Arabian context, which demands contextual interpretation particularly due to thalassemia and PPI confounders. Findings recommend using both biomarkers simultaneously for improved diagnosis and combining them with additional progressive tests and demographic-specific thresholds.

Keywords: ***Anemia, Iron-deficiency, Saudi Arabia, Ferritins, Biomarkers, Thalassemia***

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