

MICRONUTRIENT STATUS AND ITS RELATIONSHIP WITH INFLAMMATORY ACTIVITY IN PATIENTS WITH ULCERATIVE COLITIS

G.Sh. Eshniyazova

Bukhara State Medical Institute, Bukhara, Uzbekistan

Background. Assessing micronutrient status may provide additional information when evaluating patients with ulcerative colitis (UC). However, differences in micronutrient concentrations between patient groups should be distinguished from associations with clinical severity and inflammatory activity. Understanding these relationships is important for selecting individualised supplementation rather than prescribing multiple vitamin and mineral preparations routinely.

Objective. To characterise baseline micronutrient status in patients with UC receiving conservative or surgical treatment and assess its relationship with clinical severity, inflammatory markers and endoscopic activity.

Materials and methods. This observational study included 105 patients with confirmed UC treated at Bukhara Regional Multidisciplinary Medical Centre during 2023–2024. The conservative treatment group comprised 74 patients, while 31 patients underwent surgery. Thirty healthy participants formed the control group. Mean ages were 43.97 ± 14.25 , 41.55 ± 11.11 and 36.73 ± 11.74 years, respectively. Laboratory measurements were obtained before treatment or surgery and included serum iron, zinc, copper, magnesium, total calcium, 25-hydroxyvitamin D, vitamin B12 and folate. C-reactive protein and faecal calprotectin were assessed alongside endoscopic findings. Clinical severity was classified using Truelove–Witts criteria, and endoscopic activity was evaluated using the Mayo endoscopic subscore. Group comparisons used Mann–Whitney and Kruskal–Wallis tests. Spearman correlations were calculated

separately within each patient group. Holm adjustment was applied to multiple comparisons. Results are presented as mean $\pm$ standard deviation.

Results. The surgical group showed a distinct preoperative micronutrient profile. Compared with conservatively treated patients, these patients had lower serum iron (8.20 ± 1.29 versus 10.63 ± 1.93 $\mu\text{mol/L}$), zinc (9.76 ± 1.76 versus 12.43 ± 2.56 $\mu\text{mol/L}$), magnesium (0.649 ± 0.074 versus 0.766 ± 0.090 mmol/L) and total calcium (1.96 ± 0.10 versus 2.21 ± 0.11 mmol/L). Conversely, copper was higher in the surgical group (24.42 ± 4.50 versus 19.89 ± 2.86 $\mu\text{mol/L}$). All these between-patient-group differences were significant after adjustment ($p<0.001$).

Vitamin concentrations followed a similar pattern. Vitamin D levels were 12.01 ± 4.31 ng/mL in the surgical group, 21.45 ± 6.20 ng/mL in the conservative group and 44.58 ± 5.23 ng/mL in controls. Corresponding vitamin B12 concentrations were 213.74 ± 58.58 , 317.96 ± 80.41 and 529.90 ± 128.94 pg/mL , while folate concentrations were 3.91 ± 1.24 , 6.96 ± 1.91 and 11.31 ± 2.37 ng/mL . All pairwise comparisons for these vitamins were significant (adjusted $p<0.001$).

Despite these differences, none of the investigated mineral or vitamin concentrations differed significantly across mild, moderate and severe clinical categories. High endoscopic activity was recorded in 67.7% of surgical patients and 33.8% of conservatively treated patients; the overall distribution of endoscopic activity differed significantly ($p=0.006$). Within the surgical group, serum iron correlated positively with faecal calprotectin ($r_s=0.657$; Holm-adjusted $p=0.0021$). No other investigated correlation remained significant after adjustment.

Conclusion. Patients undergoing surgery had lower baseline concentrations of several minerals and vitamins and higher copper than conservatively treated patients. However, these differences were not reproduced across clinical severity categories, and most within-group correlations with inflammatory activity were not significant. Micronutrient status should therefore be assessed directly and individually rather than inferred from clinical severity or inflammatory markers alone. The observed

associations do not establish causality, and differences in age and clinical characteristics should be considered when interpreting comparisons with controls.