

## Prognostic Impact of Hyponatremia in Patients with Colorectal Cancer

Joon Seok Choi<sup>1</sup>, Eun Hui Bae<sup>1</sup>, Seong Kwon Ma<sup>1</sup>, Sun Seog Kweon<sup>2, 3</sup>, Soo Wan Kim<sup>1</sup>

Department of Internal Medicine<sup>1</sup>, Chonnam National University Medical School, Gwangju, Korea  
Department of Preventive Medicine<sup>2</sup>, Chonnam National University Medical School Gwangju, Korea  
Jeonnam Regional Cancer Center<sup>3</sup>, Chonnam National University Hwasun Hospital,  
Hwasun-gun, Republic of Korea

**Background:** Hyponatremia is a common electrolyte disorder associated with tumor-related conditions. However, the clinical impact of hyponatremia in patients with colorectal cancer has not been evaluated.

**Methods:** We retrospectively assessed 2944 patients who had been admitted to Chonnam National University Hwasun Hospital with a diagnosis of colorectal cancer. In order to determine the relationship between serum sodium level and 3-year mortality, we categorized the patients according to the sodium level as having normonatremia (135-147 mEq/L) or mild (130-134 mEq/L), moderate (125-129 mEq/L), or severe hyponatremia (<125 mEq/L).

**Results:** Hyponatremia, defined as a serum sodium level of <135 mEq/L, was evident in 27.6% of patients during hospitalization. Declining serum sodium levels were associated with increasing age, a higher number of comorbidities, a more advanced TNM stage, and worsening biochemical parameters. In a multivariate Cox-proportional regression analysis, the mortality risk was correlated with the severity of hyponatremia (hazard ratio [HR]: 1.65, 95% confidence interval [CI]: 1.38-1.96; HR: 2.24, 95% CI: 1.69-2.98; HR: 2.20, 95% CI: 1.25-3.90, for patients with mild, moderate, and severe hyponatremia compared with patients with normonatremia, respectively). An independent association between hyponatremia and long-term mortality was sustained among various subpopulations, and patients with persistent hyponatremia had a worse prognosis as compared those with hyponatremia that was resolved or acquired during hospitalization.

**Conclusion:** A substantial proportion of patients developed hyponatremia during hospitalization, and the long-term mortality risk increased even in mild cases of hyponatremia. Hyponatremia should be considered as an important prognostic factor in patients with colorectal cancer.

**Key Words:** Colorectal cancer, Hyponatremia, Prognosis