Risk Factors for Bowel Obstruction and Effect of Survival on Newly Diagnosed Colorectal Cancer Patients: An Example of 2000–2009 Colorectal Cancer Cohorts in Taiwan
Pi-Ching Hsieh 1 & Hui-Fang Su1

1Associate Professor, Department of Health Care Management, National Taipei University of Nursing and Health Sciences

Objectives: Bowel obstruction (BO) is major complication after resection of colorectal cancer, and is associated with increased mortality. The purpose of this retrospective cohort study was to investigate the incidence and risk factors for developing a new BO in a population-based cohort of colorectal cancer patients who had undergone surgery, and also to determine the effect of BO on survival.

Methods: A retrospective cohort study was conducted between 1997-2010 using the National Health Insurance Research Database in Taiwan. The incidence of BO amongst 2000-2009 colorectal cancer cohorts and the associated risk factors were determined based on Poisson distribution. Propensity score matching was used to determine the effect of BO on 1-year mortality through accelerated failure-time (AFT) model analysis.

Results: Amongst 45,371 patients with newly diagnosed colorectal cancer between 2000 and 2009, the 1-year cumulative BO incidence was 7.93%, with a rate of 20.21 events/100 patient-years during the first month. Based on a multivariate model, significant predictors of developing BO within 1-year were age (adjusted incidence rate ratio [aIRR] = 1.06 if ≥ 75 years vs < 45; 95% CI [1.04-1.06]), gender (aIRR = 1.09 if men vs female; 95% CI [1.08-1.09]), type of surgery (aIRR = 1.01 if rectal resection vs colon resection; 95% CI [1.01-1.02]), history of perioperative transfusion (aIRR = 1.04 if yes vs no; 95% CI [1.03-1.05]), and surgeon annual case volume (aIRR = 1.11 if high vs extreme low; 95% CI [1.09-1.12]). Based on AFT model analysis, after controlling for other variables, patients with BO had a higher risk of 1-year mortality than those without BO (adjusted Rate Ratio = 2.72, 95% CI [1.05–1.72]) and had a constant hazard ratio over time.

Conclusions: Approximately 7.93% of colorectal cancer patients developed BO within 1-year, with the highest incidence in the first month after surgery. Patients with BO have a higher risk of death. Early detection of risk factors of BO (such as older age, more co-morbidities, history of perioperative transfusion, anesthesia lasting ≥ 4 hours) and appropriate prevention care should be provided by health professionals for decreasing the complications and improving the quality of cancer care. The results may be useful in the research context to facilitating the more efficient selection of high-risk patients as subjects on clinical trials of prevention of treatment.

Key words: colorectal cancer, bowel obstruction, incidence rate, survival, Accelerated Failure Time Model