



Colorectal surgery is associated with a high rate of surgical site infection (SSI), the latter occurring in about 11–28% of all patients who undergo colorectal surgery. Complications arising from SSI significantly increase an individual's length of hospital stay, reduce quality of life and can also lead to additional health care needs.

Among the potentially mutable risk factors for SSI are those related to challenges to the immune system, as weakened immune systems are more prone to SSI. Seasonal variations in weather and associated season related illnesses contribute significantly to immune system fluctuations. For example, infections such as cold, flu and chest infections are more common in the winter. It has been suggested that the upsurge in infections seen in the winter may be associated with lower concentration of vitamin D (25-hydroxyvitamin D). However, while much is known about the prevalence of hypovitaminosis D and season related effects on the immune system status in the general population, there is a scarcity of studies focusing on surgical patients.

The primary aim of this study was to compare the rates of surgical wound infection among patients having colorectal surgery in the winter to those among patients having surgery in the summer. The secondary aim was to compare rates of postoperative infections after colorectal surgery between patients with high Vitamin D concentration and those with low vitamin D concentration.

A total of 2,919 patients who underwent colorectal surgery were included in the study. Patients were divided into season surgical procedures depending on their date of surgery (spring: March 21–June 20; summer: June 21–September 22; fall: September. 23–December 20; and winter: December 21–March 20). All patients who had any measured vitamin D were considered for secondary analysis in this study. Documented vitamin D levels were obtained starting 3 months prior procedure date to 1 month after. Vitamin-D sufficiency was defined as a serum 25(OH) D level of 32 ng/mL. Vitamin-D inadequacy was defined as a serum 25(OH) D level of  $< 32$  ng/mL and was further divided into vitamin-D insufficiency (20 to  $< 32$  ng/mL) and vitamin-D deficiency ( $< 20$  ng/mL). Selected covariate information was also obtained and included, but was not limited to: demographics, diagnoses, type of procedure, and intraoperative variables (e.g. intraoperative blood transfusions and length of surgery). Pediatric patients and patients with missing covariate information were excluded from the study.