

Does BMI influence adverse postoperative outcomes following colorectal cancer surgery?

Simon Wilkins^{1,2}, Mohammad Asghari-Jafarabadi³, Raymond Yap¹, John Paul Plazzer¹, Paul McMurrick¹

1. Cabrini Monash University Dept. of Surgery, Cabrini Hospital 2. Dept. of Epidemiology and Preventive Medicine, Monash University 3. Cabrini Research, Cabrini Hospital

Background

Colorectal cancer (CRC) is common in Australia, with over 15,000 cases reported yearly. High body mass index (BMI) values in patients are often considered a risk factor for poorer outcomes after surgery for CRC, although there are contrasting results in the literature. A Chilean study of 449 patients found there was no difference in the rate of postoperative complications between obese and non-obese patients (1). In our previous study of 1464 patients, high BMI values were associated with a higher likelihood of conversion of laparoscopic surgery to open and a higher rate of surgical complications (2).

This study aimed to investigate the effect of BMI on postoperative outcomes following CRC surgery.

Methods

A retrospective analysis of prospectively collected data was carried out on patients undergoing surgery for CRC between 2010 and 2021 at two Victorian tertiary referral hospitals (Cabrini and The Alfred hospitals). Patients were divided into groups based on BMI (<30 or ≥30). Patient characteristics, operative data, pathology and postoperative outcomes were analysed.

Abbreviation: American Society of Anesthesiologists (ASA).

Table 1. Selected clinicopathological features (* Fisher's exact tests)

Variable	BMI<30 n=2836 (79.2%)	BMI ≥30 n=746 (20.8%)	p-value *
Male gender	1453 (51.2)	379 (50.8)	0.837
ASA 1	595 (21.1)	72 (9.7)	<0.001
ASA 2	1120 (39.7)	310 (41.7)	
ASA 3	966 (34.2)	327 (44.0)	
ASA 4	143 (5.1)	35 (4.7)	
Stage I	710 (28.8)	213 (33.8)	0.002
Stage II	753 (30.6)	184 (29.2)	
Stage III	689 (28.0)	184 (29.2)	
Stage IV	313 (12.7)	50 (7.9)	
Open	594 (25.0)	175 (28.2)	<0.001
Laparoscopic	1641 (69.1)	381 (61.4)	
Conversion	140 (5.9)	65 (10.5)	
Return to theatre	179 (6.3)	46 (6.2)	0.933
Anastomotic leak	59 (2.1)	19 (2.6)	0.480
Surgical Complications	493 (17.4)	162 (21.7)	0.008
Medical Complications	268 (9.5)	67 (9.0)	0.724
Wound Infection	63 (12.8)	37 (22.8)	0.004
Wound dehiscence	36 (7.3)	16 (9.9)	0.315
In patient death	19 (0.7)	7 (0.9)	0.466
30-day Mortality	19 (0.7)	3 (0.4)	0.598

Results

3582 patients were identified on the database with 51% male. 2836 patients had a BMI <30, 746 patients had a BMI ≥30 (Table 1). A higher proportion of high BMI (≥30) patients were ASA 2 or 3 than lower BMI patients. High BMI (≥30) patients had a higher rate of open procedures and double the rate of laparoscopic to open conversions (5.9% vs 10.5%; p<0.001). High BMI patients had a higher rate of stage 1 cancers and a lower rate of stage 4 cancers than the <30 BMI group (p=0.001). Return to theatre, anastomotic leak, medical complications, and 30-day mortality were not significantly different between the two BMI groups. High BMI (≥30) patients had increased surgical complications (p=0.008) and wound infections (p=0.004) but no difference in wound dehiscence (p=0.315)(Table 1).

Conclusions

High BMI can influence adverse postoperative outcomes in CRC patients. High BMI patients were more likely to have the conversion of laparoscopic surgery to open procedures. Higher rates of surgical complications and wound complications were observed in patients with higher BMI values.

Acknowledgements

The authors thank the colorectal surgeons for providing their patients' data for this project. We thank LBBC (www.letsbeatbowelcancer.com) for financial support during this project.

No conflicts of interest

References

1. Estay et al 2014 *Surg. Endosc.* 28 2090-2096
2. Bell et al 2016 *Colorectal Disease* 20 778-788