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The relationship between sex, body mass index, and postoperative outcomes in patients undergoing surgery for colorectal cancer

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There is increasing evidence that an increased BMI is associated with increased complications after surgery for colorectal cancer[(1)]. However, the basis of this relationship is not clear. Since men and women have different fat distribution, with men more likely to have excess visceral fat in BMI defined obesity, there may be a sex difference in the surgical site infection rate in the obese. Therefore, the aim of this study was to establish whether there were gender differences in complication following surgery for colorectal cancer.

Data were recorded prospectively for patients undergoing surgery for colorectal cancer. Complications were classified as either infective or non-infective. The relationship between sex, BMI, associated clinicopathological characteristics and complications were examined.

A total of 1039 patients (56% male) were included. There were significant differences in the presence of complications between male and female ($p \leq 0.001$), the rate of complication was higher in obese male (44%); in particular infective complications; surgical site infection, wound infection and anatomic leak ($p \leq 0.05$).The rate of surgical site infection was 12% in male patients with normal BMI compared with 26% in those with a BMI ≥30 ($p \leq 0.001$), while the rate of surgical site infection in female patients was 10% in those with normal BMI and those with a BMI ≥30 ($p = 0.054$). In male patients the rate of superficial wound infection was 7% with normal BMI compared with 20% in those with a BMI ≥30 ($p \leq 0.001$), while the rate of superficial wound infection was 6% in female patients with normal BMI compared with 8% in those with a BMI ≥30 ($p = 0.003$).

The results from this study would indicate that the association between obese male and increased surgical site infection was probably not due to differences in sex hormones but merely due to the fact that men had more fat inside the abdominal wall, which may result in more difficult resections and longer incisions[(2)]. In addition, abdominal obesity is associated with metabolic abnormalities such as insulin resistance, as well as the release of insulin like growth factors, which are known to contribute to the progression of malignant colonic cells and associated with poor operative outcome[(3)]. Finally, the presence of excess visceral fat in obese patients, with decreased oxygen tension and circulation, leads to impaired wound healing[(4)]. In conclusion, obesity in male patients was associated with greater risk of surgical site infection and wound infection compared to female patients. Obese males should be considered at high risk of developing post-operative infective complications.

1. Almasaudi AS, McMillan D *et al.* (2017) *CROH* **121**, 68–73.
2. Makino T, Rubino F *et al.* (2012) *Annals of Surgery* **255**(2):228–236.
3. Murphy TK, Thun M *et al.* (2000) *Am J Epidemiol* **152**, 847–854.
4. Kabon B, Kurz A *et al.* (2004) *Anesthesiology* **100**(2):274–280.