World Academy of Science, Engineering and Technology
International Journal of Medical and Health Sciences
Vol:16, No:08, 2022

Effects of Different Types of Perioperative Analgesia on Minimal Residual Disease Development After Colon Cancer Surgery

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Abstract : Cancer is the second leading cause of death worldwide and colon cancer is the second most common type of cancer. Currently, there are only a few studies evaluating the effect of postoperative analgesia on the prognosis of patients undergoing radical colon cancer surgery. Postoperative analgesia in patients undergoing colon cancer surgery is usually managed in two ways, either with strong opioids (morphine, piritramide) or epidural analgesia. In our prospective study, we evaluated the effect of postoperative analgesia on the presence of circulating tumor cells or minimal residual disease after colon cancer surgery. A total of 60 patients who underwent radical colon cancer surgery were enrolled in this prospective, randomized, two-center study. Patients were randomized into three groups, namely piritramide, morphine and postoperative epidural analgesia. We evaluated the presence of carcinoembryonic antigen (CEA) and cytokeratin 20 (CK-20) mRNA positive circulating tumor cells in peripheral blood before surgery, immediately after surgery, on postoperative day two and one month after surgery. The presence of circulating tumor cells was assessed by quantitative real-time reverse transcriptase-polymerase chain reaction (qRT-PCR). In the piritramide postoperative analgesia group, the presence of CEA mRNA positive cells was significantly lower on a postoperative day two compared to the other groups ($p=0.04$). The value of CK-20 mRNA positive cells was the same in all groups on all days. In all groups, both types of circulating tumor cells returned to normal levels one month after surgery. Demographic and baseline clinical characteristics were similar in all groups. Compared with morphine and epidural analgesia, piritramide significantly reduces the amount of CEA mRNA positive circulating tumor cells after radical colon cancer surgery.

Keywords : cancer progression, colon cancer, minimal residual disease, perioperative analgesia.
Conference Title : ICASPM 2022 : International Conference on Anesthesiology, Surgery and Perioperative Medicine
Conference Location : Barcelona, Spain
Conference Dates : August 16-17, 2022