

News & Comments

Pre-Treatment with Hydromorphone before Laparoscopy Surgery

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Because of its benefits for smaller wounds, reduced perioperative stress responses, and fewer postoperative problems, the laparoscopic approach has recently become very popular in clinical gynaecology. Numerous inflammatory mediators can be triggered by the surgical invasion of the body. Additionally, the body's inflammatory process may become out of balance because of the stimulation of various levels of pain following surgery. To prevent organ damage, it is crucial to aggressively investigate a medicine with a precise effect and high safety. Strong efficacy, rapid onset, and high affinity are advantages of hydromorphone, a semi-synthetic derivative of pure μ -opioid receptor agonists. In this study, the perioperative effects of hydromorphone on oxidative stress, renal and immunological functions, and inflammatory variables after gynaecological laparoscopic surgery under general anaesthesia were investigated.

The study was carried out in the Department of Gynaecology of The Second Affiliated Hospital of Nanchang University, China. Sixty patients, ranging in age from 32-58 and weight from 44-68 kg, underwent gynaecological laparoscopic surgery while under general anaesthesia. The American Society of Anaesthesiologists classifies substances as Class I or II (ASA). The intramuscular injection of 0.5 mg atropine was given to both groups of patients undergoing gynaecological laparoscopic surgery under general anaesthesia (specification, 1 mL: 0.5 mg). After entering the surgery room, patients' veins were kept open. The observation group received an intravenous infusion of 100,000 U of hydromorphone (15 minutes before skin cutting; specification, 0 mL: 10 mg; Yichang Humanwell Pharmaceutical Co., Ltd., National Pharmaceutical Standard H20120095). Data processing was done using SPSS22.0 software.

The baseline information for the two groups was evenly distributed ($p > 0.05$) in terms of gender, age, Body Mass Index (BMI), surgery time, ASA classification, and operation type. At T1, there was no statistically significant difference between the oxidative stress indicators of the observation group and those of the control group ($p > 0.05$). Additionally, At T1, there was no discernible difference between the two groups in the markers of inflammatory factors ($p > 0.05$). Gynaecological laparoscopic surgery can cause oxidative stress in varying degrees, with the major effects being an imbalance in the antioxidant defence-oxidation process and an increase in hypothalamic-pituitary-adrenal cortical activity. The artificial CO₂ pneumoperitoneum used during the procedure will slightly raise the abdominal cavity's pressure and alter the blood supply to the abdominal viscera and the tissue of the



abdominal wall.

T cell-mediated cellular immunity has been linked to carcinogenesis, illness progression, and prognosis in clinical studies. When the levels of CD3+, CD4+, and CD8+ are out of balance, the body enters an immunosuppressive state, which allows a lot of tumour cells to evade immune cell monitoring and could lead to infection or worsening of existing conditions.

In conclusion, pre-treatment with hydromorphone before gynaecological laparoscopic surgery can relieve cellular immune suppression brought on by surgical stress, improve oxidative stress responses and renal function, reduce the expression of inflammatory factors, and significantly lessen patient pain levels while maintaining high safety.

This study reveals that pre-treatment with hydromorphone for patients undergoing gynaecological laparoscopic surgery under general anaesthesia can significantly relieve cellular immune suppression caused by surgical stress, improve oxidative stress responses and renal function, reduce the expression of inflammatory factors, and reduce the degree of pain experienced by patients. This is beneficial to the patients' ability to tolerate surgery and aids in their recovery.

JOURNAL REFERENCE

Ma, C., D. Zhao, X. Hu, C. Li, J. Zhang, Y. Zhang and L. Yuan, 2022. Perioperative effects of hydromorphone in gynecological laparoscopic surgery under general anesthesia. *Int. J. Pharmacol.*, 18: 534-542.

KEYWORDS

Gynaecological laparoscopic surgery, general anaesthesia, hydromorphone, oxidative stress, renal function, μ -opioid receptor, ischemia

