

# Use of Remifentanyl in Monitored Anaesthesia Care (MAC) in Patients Undergoing Extracorporeal Shock Wave Lithotripsy

Sir,

Extracorporeal shock wave lithotripsy (ESWL) has been widely practised for the treatment of urinary tract stones.<sup>1</sup> The procedure can be quite painful and; hence, patients need anaesthesia. Intravenous (IV) analgesia and sedation or monitored anaesthesia care (MAC) is usually preferred because of quicker recovery profile compared to general anaesthesia (GA) or epidural anaesthesia.<sup>2</sup> Multiple regimens of MAC for ESWL have been studied, including propofol and/or opioids.<sup>3,4</sup> Remifentanyl is one of synthetic opioid with ultra-short duration of action because of its plasma ester metabolism.<sup>5</sup>

We selected 10 patients, who were planned for ESWL under MAC at Security Forces Hospital, Riyadh from 15<sup>th</sup> March to 15<sup>th</sup> April 2020. The mean age of patients was 43 years with maximum age as 76 years. Seven out of 10 patients were males. Six patients had renal stones, while four had ureteric stones. Five patients were ASA 2, while three were ASA 1, and two were ASA 3. All patients received information preoperatively regarding how their sedation was going to be managed. ASA standard monitoring including ECG, blood pressure, oxygen saturation, and endtidal carbon dioxide were used in all cases. Oxygen via face mask was applied to every patient at 5-8 litres/minute. We used intravenous remifentanyl infusion for maintenance of MAC. The dosage of IV remifentanyl used during the procedure was between 0.05-0.1 mcg/kg/minute; and it was titrated to maintain adequate depth of conscious sedation. Mean duration of sedation was 57.5 ± 10.9 minutes with the range from 43 to 80 minutes. Five (50%) patients needed an additional dose of IV midazolam, three (30%) of them had anxiety during procedure, and two (20%) received as premedication and none complained of pain during procedure and none received any airway support during procedure or in PACU. All patients remained haemodynamically stable with heart rate and blood pressure remaining within 25% of baseline values. Oxygen saturation remained more than 95% during whole procedure in all patients. Two out of 10 (20%) patients had adverse events related to remifentanyl, one had itching, and other one felt nausea; but none of them needed any treatment. There were no adverse events reported in PACU.

Geszteszi *et al.*, in one study, found that alfentanil had longest time to discharge, while remifentanyl had the highest incidence of pain in PACU.<sup>2</sup> Another study by Burmeister *et al.* concluded that remifentanyl used as sole agent did not result in rapid

recovery and discharge, compared to fentanyl/propofol combination in ESWL cases.<sup>6</sup> Although in this case series, remifentanyl infusion alone resulted in stable haemodynamic and better intraoperative conditions, compared to previous studies of remifentanyl.<sup>6</sup> Fouladi *et al.*, in their randomised controlled trial, demonstrated that remifentanyl is more effective than sufentanil and morphine in pain management during all phases of ESWL.<sup>7</sup> All these patients had good recovery profile postoperatively with quick discharge from PACU (mean duration: 18 minutes) and mean VAS (visual analogue score) satisfaction score after procedure was 9.3±1.0 (total score 10).

In conclusion, the use of remifentanyl infusion for MAC has beneficial effect on recovery profile after ESWL; and IV midazolam can be combined with it in selected patients to reduce anxiety.

## CONFLICT OF INTEREST:

The authors declared no conflict of interest.

## PATIENTS' CONSENT:

All patients were consented for being the part of this case series.

## AUTHORS' CONTRIBUTION:

ASM: Concept, literature search, data collection, manuscript editing, and final approval.

NS: Literature search, data collection, manuscript editing, and final approval.

AH: Concept, literature search, data analysis, manuscript writing and editing, and final approval.

## REFERENCES

1. Salinas AS, Lorenzo-Romero J, Segura M, Calero MR, Hernández-Millán I, Martínez-Martín M, *et al.* Factors determining analgesic and sedative drug requirements during extracorporeal shock wave lithotripsy. *Urol Int* 1999; **63**(2):92-101. doi: 10.1159/000030425.
2. Geszteszi Z, Rego MM, White PF. The comparative effectiveness of fentanyl and its newer analogs during extracorporeal shock wave lithotripsy under monitored anesthesia care. *Anesth Analg* 2000; **90**(3):567-70. doi: 10.1097/00000539-200003000-00013.
3. Beloeil H, Corsia G, Coriat P, Riou B. Remifentanyl compared with sufentanil during extra-corporeal shock wave lithotripsy with spontaneous ventilation: A double-blind, randomized study. *Br J Anaesth* 2002; **89**(4):567-70. doi: 10.1093/bja/aef202.
4. Cortínez LI, Muñoz HR, De la Fuente R, Acuña D, Dagnino JA. Target-controlled infusion of remifentanyl or fentanyl during extra-corporeal shock-wave lithotripsy. *Eur J Anaesthesiol* 2005; **22**(1):56-61. doi: 10.1017/s0265021505000128.
5. Coloma M, Chiu JW, White PF, Tongier WK, Duffy LL, Armbruster SC. Fast-tracking after immersion lithotripsy: General anesthesia versus monitored anesthesia care. *Anesth Analg* 2000; **91**(1):92-6. doi: 10.1097/00000539-200007000-00018.
6. Burmeister MA, Brauer P, Wintruff M, Graefen M, Blanc I,

Standl TG. A comparison of anaesthetic techniques for shock wave lithotripsy: The use of a remifentanyl infusion alone compared to intermittent fentanyl boluses combined with a low dose propofol infusion. *Anaesthesia* 2002; **57(9)**:877-81. doi: 10.1046/j.1365-2044.2002.02820.x.

7. Fouladi A, Soleimani A. Comparison of different analgesic techniques for pain relief during extracorporeal shock wave lithotripsy: A double-blind, randomised clinical trial. *Acta Inform Med* 2017; **25(2)**:94-8. doi: 10.5455/aim.2017.25.94-98.

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