

SEDATION WITH DEXMEDETOMIDINE IS EFFECTIVE FOR SPINAL CORD STIMULATOR PLACEMENT AND EARLY POSTOPERATIVE PAIN CONTROL



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BACKGROUND

Neurostimulation is considered a viable option for the treatment of patients with intractable chronic back pain. The features of chronic exposure to opioids and surgeon requests of deep sedation in the prone position, contribute to the potential for a challenging anesthetic and perioperative course. The properties of Dexmedetomidine (DEX) include sedation, analgesia and anesthetic sparing effect.^[1] DEX is associated with minimal respiratory depression and, for this procedure, offers the advantage of easy arousability to perform neurosurgical evaluation.

METHODS

The aim of this study was to investigate the use of DEX as an alternative to the currently used anesthetic agents. Our end points included evaluating the amount of intraoperative opioid used and pain scores in the postoperative care unit two hours after surgery, in two groups of patients, those with or without DEX. Subjective pain scores were obtained on a scale from 0 = no pain to 10 = worst pain.

RESULTS

Following IRB approval, we reviewed eighteen charts of adult patients who had spinal cord stimulator placement under a combination of local anesthesia and sedation, using a variety of agents such as opioids (Fentanyl, Ketamine), and non-opioid sedatives (Propofol, Midazolam, DEX) and Ketorolac.

The patients' demographics are shown in **Table 1**. In the DEX group, there were five females and four males; ages 37 to 59; two patients were ASA III, and six patients ASA II. The average BMI was 26.53 (20.4-36.5).

All DEX-treated patients received opioids to supplement analgesia. One patient received only Ketamine 100 mg i.v. The average Fentanyl used in the DEX-treated patients was 2.46 µg/kg (0.77-5.93). In this group, the average anesthesia duration was 127 min (100-150) and the average length of surgery was 80.78 minutes (53-110). No side effects were recorded.

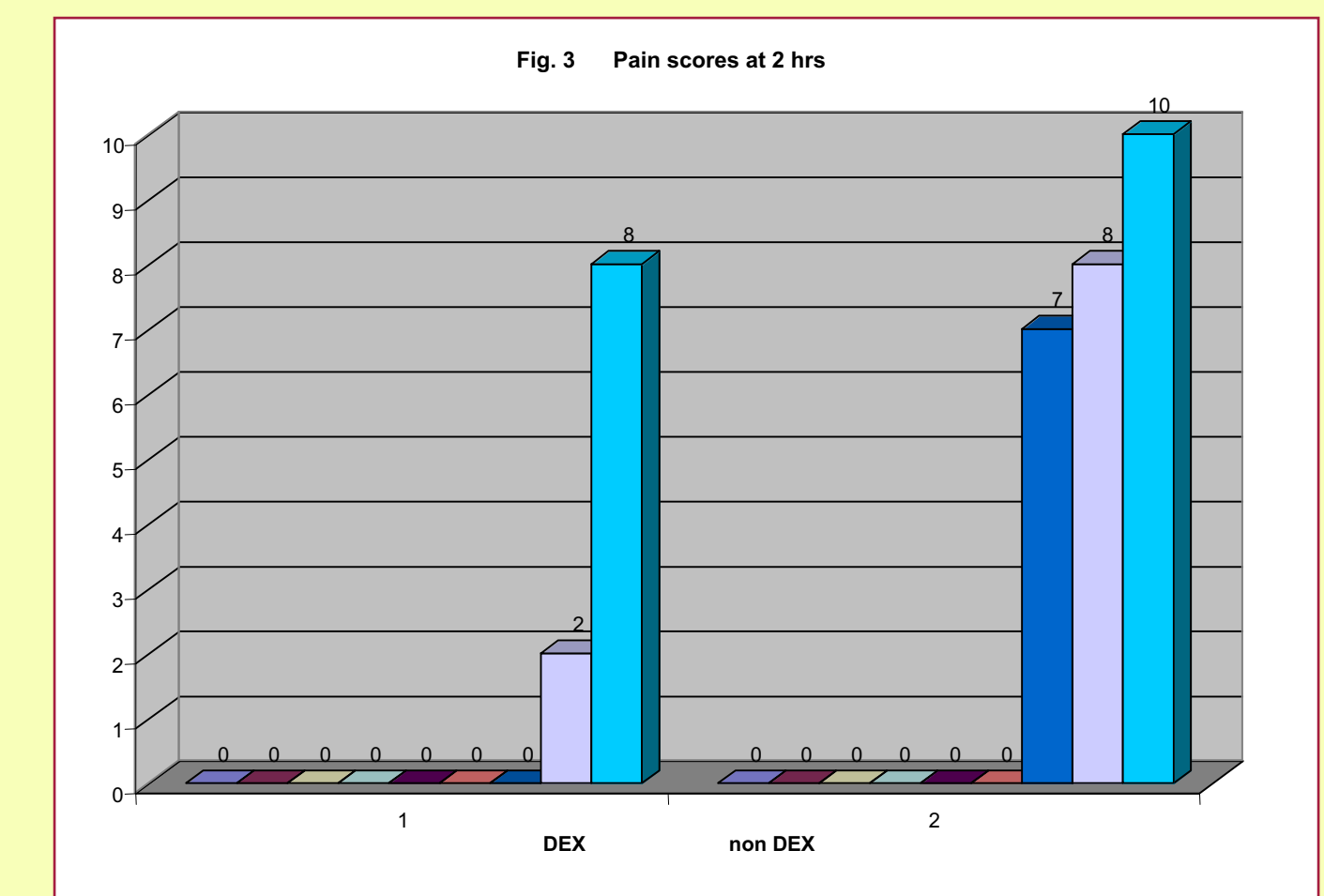
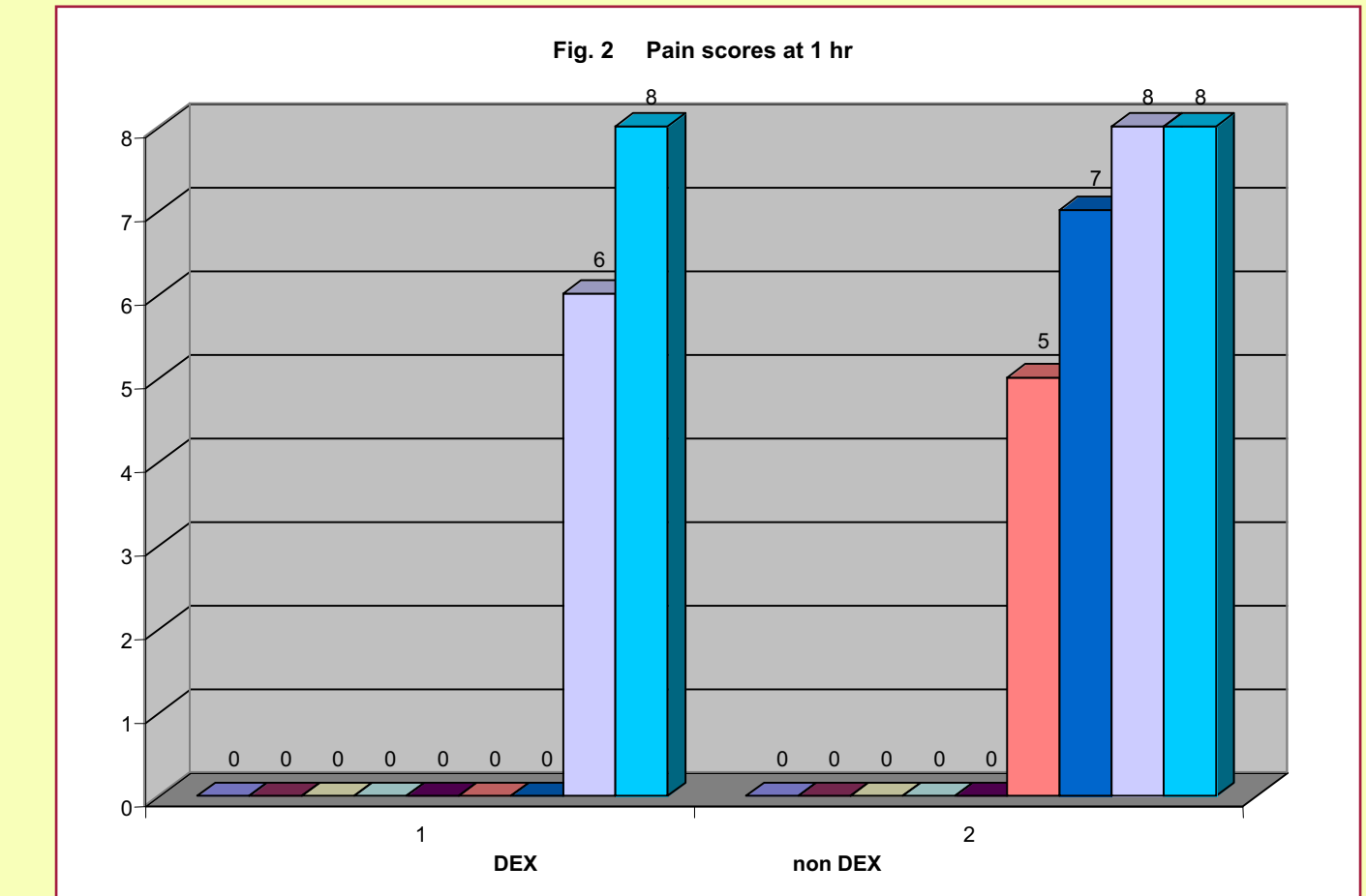
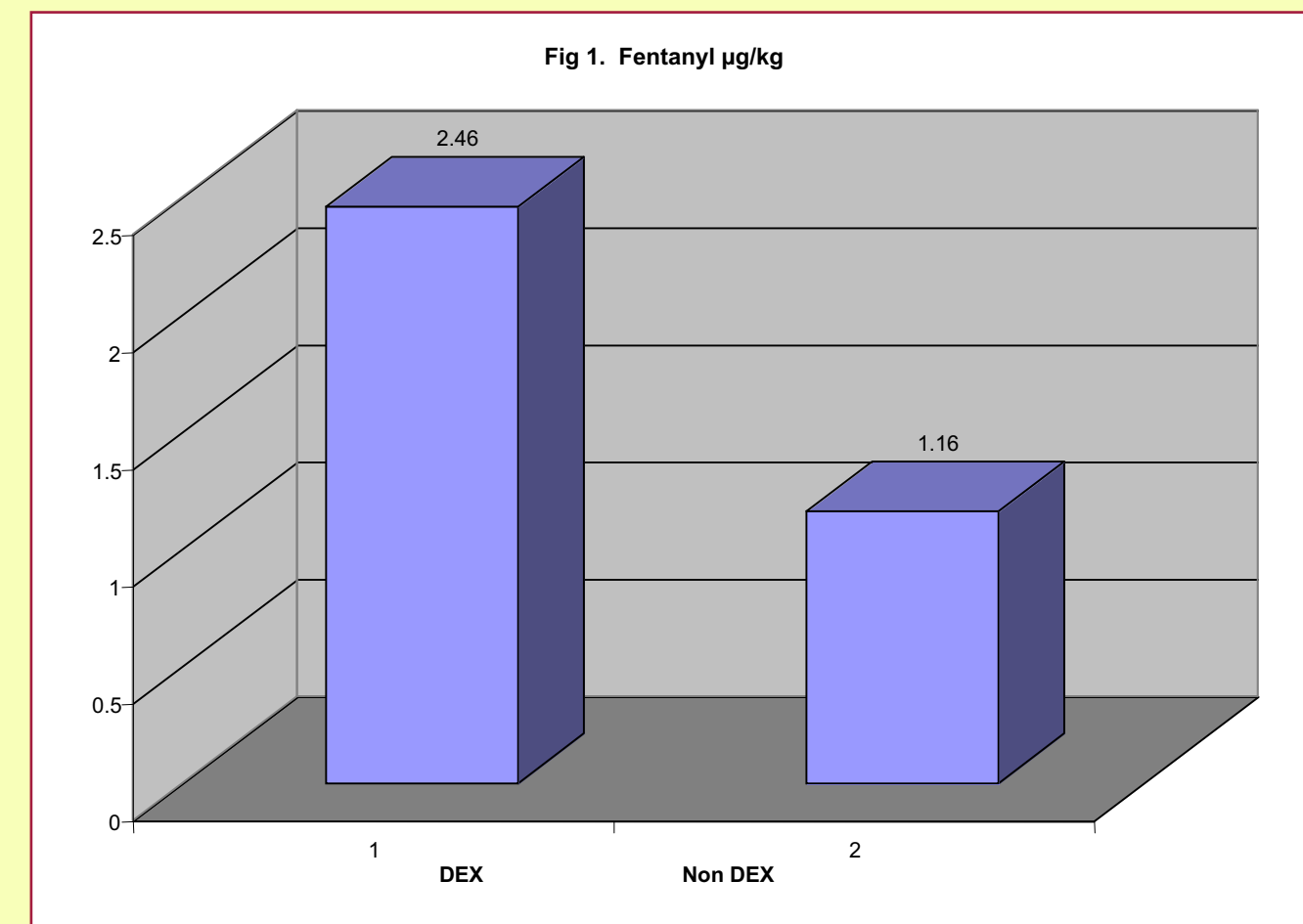
In the DEX-treated group, loading dose of DEX, 1mg/kg for 10 minutes was used for only two patients. Maintenance dose was between 0.20-1.70 µg/kg/hr, individualized and titrated for adequate sedation, stable blood pressure and heart rate.

In the group without DEX, there were four males and five females; ages 42 to 65; five patients were ASA II, and four patients were ASA III. The average BMI was 32.677 (24.4-40.7).

In this group, to supplement analgesia, the opioids were used in only six patients. Two patients received only Ketorolac i.v. and one patient received Ketamine 100 mg, i.v. and Fentanyl. The average Fentanyl dose used in this group was 1.116 µg/kg (0.65-2). The average intraoperative use of Fentanyl was higher in DEX-treated patients, 2.46 µg/kg versus 1.116 µg/kg (see **Fig. 1**)

	Sedation with DEX (n=9)	Sedation without DEX (n=9)
Age (y)	46± 6.86	52.677±7.2
BMI (kg/m ²)	26.535±2.3	31.1± 4.38
Sex (M/F)	4/5	4/5
ASA(PS)	II(7),III(2)	II(5),III(4)
DEX(µg/kg/hr)	0.20-1.70	N/A
Fentanyl (µg/kg)	2.46±1.78	1.116±0.41
Duration of Anesthesia (min)	127.2±16	131± 39.05
Duration of Surgery (min)	80.78±15.45	87.67±38.58
Side Effects	None	None

* Data are reported as mean ±SD; BMI, body mass index; ASA (PS) indicates physical status; DEX (Dexmedetomidine). N/A (not applicable)



In the first hour after surgery, only two DEX-treated patients reported moderate pain (6/10 and 8/10). Seven patients had a pain score of 0/10. (See **Fig. 2**). Only one patient required i.v. medication (Morphine 4 mg). In the second hour after surgery, in the same group, only one patient had moderate pain (8/10), requiring i.v. Morphine 4 mg. One patient had mild pain (2/10) and seven patients were pain free. (See **Fig. 3**).

In the first hour after surgery in the group without DEX, four patients reported moderate pain (one patient 5/10 and 3 patients 7-8/10). Only 5 patients were pain free (See **Fig. 2**). Four patients received opioids i.v. (Morphine, Fentanyl). In the second hour after surgery, one patient had severe (10/10) pain and two patients had moderate pain (7-8/10). Six patients were pain free (See **Fig. 3**). All three patients required administration of i.v. opioids (Demerol, Morphine).

CONCLUSIONS

DEX infusion allowed a rapid change in the level of sedation and analgesia during periods of intense surgical stimulation, with no episodes of respiratory depression in the prone position and provided an awake and cooperative patient during functional testing. Its properties allowed the anesthesiologist to administer more intraoperative opioids and provide better postoperative analgesia.

REFERENCES

1. Bekker A., Sturaitis Dexmedetomidine for Neurosurgical Surgery. Neurosurg 57[ONS Suppl 1]:ONS-1-ONS-10, 2005.