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Case Report

Anaesthesia Section

Perioperative Sedation and Sympatholysis Due to Tizanidine

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ABSTRACT

Tizanidine is a short acting central muscle relaxant. It has agonist activity at noradrenergic alpha 2 receptors and inhibits the excitatory (presynaptic) motor neurons at both the spinal and supraspinal levels. Its action is through central alpha 2 receptors agonism. Tizanidine is a Food and Drug Administration (FDA) approved drug for reducing muscle tone in spastic conditions like spastic quadriparesis, multiple sclerosis, spinal cord injury and so on. Working knowledge of this kind of drugs are rarely used in the clinical practice which is useful for the anaesthesiologists to manage cases in the perioperative period. Here Authors reported the perioperative effects of Tizanidine in a patient with clitoral mass excision under general anaesthesia. All preoperative investigations were found with in normal limits. Patient was on tizanidine preoperatively for spastic quadriparesis. Intraoperatively, there were no significant fluctuations of Blood Pressure (BP) and Heart Rate (HR) even laryngoscopic response blunted. Postoperatively patient was calm and drowsy. This perioperative sympatholysis and sedation was due to tizanidine.

Keywords: Anaesthesia, Hypotension, Noradrenergic, Postoperative

CASE REPORT

A 26-year-old woman reported to the Department of Obstetrics and Gynaecology with primary complaint of a mass growing from her clitoris for last two years and diagnosed as a case of benign clitoral growth. She was planned for excision of clitoral mass and referred to Pre-Anaesthetic Checkup (PAC) clinic for surgical fitness. On PAC, it was found that she was mute, spastic quadriparetic and bedridden. She also had seizure disorder starting from 18 years of age. Her last seizure episode was 15 days back, seizure was generalised tonic clonic type and duration of seizure was around 5-7 minutes since she was not on regular antiepileptic treatment. There was no other co-morbidity, no surgical or anaesthesia history. Patient was a known case of post-encephalitis sequelae with seizure disorder and was on T. Levetiracetam 500 mg BD, T. Clonazepam 0.25 mg BD and T. Tizanidine 2 mg BD. On examination, her Pulse Rate (PR) was 80 beats per minute, regular rhythmic and BP was 110/70 mm of Hg in the right arm supine position. Cardiovascular, respiratory and airway examination were found with in normal limits.

On neurological examination, spastic quadriparesis was present. Her routine investigations were within normal limits. Patient was planned for excision of clitoral growth under general anaesthesia. On the morning of surgery, the antiepileptics and Tizanidine were continued. Vitals in the preoperative room were found to be on the lower end of normal limits (Compared to PAC clinic), PR 52 beats per minute, regular rhythm BP- 94/52 mm of Hg and her room air saturation was 98%. After preparation of operation theatre, patient was shifted to operating room and was made in supine position. General anaesthesia was given according to standard protocol. She was given Inj. Midazolam 1 mg in incremental doses, followed by Inj. Fentanyl 50 mcg, followed by Inj. Propofol in titrated doses in view of low normal PR and BP and induced with total dose of 30 mg propofol only then Inj. Vecuronium 4 mg was given. Laryngoscopy was done and patient intubated and maintained with 40% oxygen + 60% nitrous oxide with sevoflurane at a Minimum Alveolar Concentration (MAC) of 0.7. Just after laryngoscopy her vitals were PR- 54 beats per minute, BP- 90/50 mm of Hg. Surgery lasted for one hour and was uneventful. After surgery, patient was reversed and extubated with no complications. Postextubation patient was still sedated (Ramsay Sedation Score 3), but there was no respiratory depression and her post-extubation vitals were PR- 52 beats per minutes, BP- 90/54 mm of Hg. Patient was maintaining oxygen saturation of 99% on room air and was shifted to Post-Anesthesia Care Unit (PACU). Notably, there was no sympathetic response both during laryngoscopy with intubation and during extubation. There was also no fluctuations in the cardiovascular response during the surgery with minimal anaesthesia. Postoperatively, her condition was stable. She was still sedated, with PR and BP on the low normal range, PR- 52 beats per minute, BP- 92/52 mm of Hg. She regained consciousness after three hours into PACU. The patient medications were reviewed and tizanidine was suspected to be the cause for the sedation with decreased sympathetic response because no other metabolic abnormality was found in arterial blood gas analysis. Therefore, from the postoperative period, tizanidine was stopped. Patient was shifted to ward and followed-up for 48 hours. All the sympatholytic effects resolved within 24 hours. There were no symptoms of tizanidine withdrawal. General condition and vitals of the patient in ward returned to same level as was during primary evaluation in PAC clinic.

DISCUSSION

Tizanidine is a short acting central muscle relaxant. It has agonistic action at noradrenergic alpha 2 receptors and inhibiting the excitatory (presynaptic) motor neurons at spinal and supraspinal levels. Tizanidine is a FDA approved drug for reducing muscle tone in spastic conditions like spastic quadriparesis, multiple sclerosis, spinal cord injury etc., [1-3]. Tizanidine is available in oral tablets form of 2 mg or 4 mg. Compared to other commonly used drugs for central muscle relaxation like Baclofen and Diazepam, this drug is considered to be more tolerable [4,5]. The most common side effect of this drug is drowsiness or dizziness. There is paucity of data in literature regarding the perioperative usage of Tizanidine. In this patient, it was observed that perioperative administration of Tizanidine reduced the sympathetic responses during laryngoscopy, intubation and extubation period [6]. Also lesser amount of premedication and induction agent (Inj. Propofol) were required for inducing anaesthesia and also lesser MAC (0.7) of sevoflurane required for maintenance of anaesthesia [7,8]. Tizanidine is chemically related to clonidine. Miettinen TJ et al., did a study on effects of oral tizanidine and showed that arterial BP effects of tizanidine and clonidine were similar in magnitude, but that of tizanidine lasted for a shorter period [9]. Since the

mechanism of action of tizanidine is same as that of clonidine and dexmedetomidine, the perioperative effects of tizanidine on this patient was similar to that of perioperative clonidine or dexmedetomidine usage [10]. In postoperative period scheduled dose of tizanidine was not given as patient was already drowsy and there were no signs and symptoms of tizanidine like dizziness, fast heartbeats, tremors, anxiety, nausea, vomiting and high BP [11]. Thus, Tizanidine should be best avoided on the day of surgery in patients who are already at risk for unstable haemodynamics perioperatively [12,13].

CONCLUSION(S)

Since tizanidine is available only in oral form, tizanidine can be used as a pre-anaesthetic medication to cause sedation with stable haemodynamics on the day of surgery with added advantage of anaesthetic sparing effects and lesser opioid usage. However, further studies are required to ascertain the effect of tizanidine and delineate its usage among patients scheduled for surgery.

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