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ADVANTAGES OF INTRATHECAL BUPIVACAINE AND DEXMEDETOMIDINE COMBINATION OVER BUPIVACAINE AND CLONIDINE: A COMPARATIVE ANALYSIS IN GYNAECOLOGICAL INTERVENTIONS

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Abstract

Background: most of the gynaecological interventions are generally done under regional anaesthesia. Currently dexmedetomidine came out as a beneficial adjunct for regional analgesia as well as anaesthesia. It is a highly selective α-2 agonist. Aims & objectives: to compare the effects & behavior of dexmedetomidine with clonidine when both are used with bupivacaine for spinal analgesia. Material and Methods: 100 cases of ASA grade 1 & 2 who were undergoing elective gynaecological surgical intervention were studied. They were divided into two groups (50 each). Group I received combination of bupivacaine & clonidine while group II received combination of bupivacaine + dexmedetomidine. Results: Average duration of onset of sensory block was earlier in group II. Arrival of motor block in Group I was slightly on lower side than Group II. Ten cases in Group I and eighteen cases from group II had notable bradycardia and hypotension. Discussion: Our study concludes that dexmedetomidine when used in combination with bupivacaine is very effective in gynaecological surgical interventions that demand longer duration & have comparatively lesser side effects.

Keywords: dexmedetomidine, clonidine, Bupivacaine, gynaecological procedures.

Introduction

During the last few decades, there is a phenomenal improvement in various anesthetic techniques. Lots of combinations of anesthetic agents have been tried and tested with variable success rates. Most of the gynaecological surgical interventions are done under regional anesthesia[1,2]. Bupivacaine is very commonly used agent for these procedures. Its low doses are commonly associated with inadequate level of sensory block. Hence many agents are used in combination with Bupivacaine for prolongation of intra & post operative analgesia[3,4]. The idea of using the selective α-2 agonist in combination with bupivacaine for coinduction of anaesthesia came into existence. Clonidine is very commonly used for this purpose. But recently Dexmedetomidine, which is also a highly selective α-2 agonist turned out to be very effective for delaying analgesia in post surgical period with lesser side effects[5,6.] It is very commonly used nowadays as it is very hemodynamic, a decent sedative & analgesic but most important of all it is neuro-protective with anesthetic sparing effect. Many of the previous studies have proved the effectiveness of intrathecal 5 mcg of dexmedetomidine for prolonging spinal analgesia[7,8,9]. Current comparative study will try to analyse the same especially in gynaecological surgical interventions.

Material and Methods:

100 cases of ASA (American Society of Anesthesiology) grade 1 & 2 who were undergoing elective gynaecological surgical intervention were studied at K.M. Medical College and Hospital, Mathura. Approval was taken from hospital ethics committee. Written informed consent was taken from each & every study subject. Those individuals who were having past history of any cardiac illness, deranged renal function or any hepatic anomaly or any history of hypersensitivity to anaesthetic agent were excluded from our study. They were divided into two groups of 50 each. Group I received combination of bupivacaine & clonidine while group II received combination of bupivacaine + dexmedetomidine. All cases were examined & thoroughly investigated one day before surgery & all were made familiar to visual analogue scale (VAS)[10].

Table 1: Study Groups

Group	Anesthetic administered intrathecally
I	bupivacaine 12.5 mg (2.5 ml) + clonidine 30 µg (0.2 ml) + preservative free normal saline (0.3 ml)
II	bupivacaine 12.5 mg (2.5 ml) + dexmedetomidine 5 µg (0.05 ml) +preservative free normal saline (0.45 ml)

All the cases were studied in detail for duration & onset of sensory block, highest level of that block, time to reach sensory block, onset of motor block, time to complete motor block recovery & duration of spinal anesthesia. Blood pressure was managed by calculated fluid maintenance. In cases where pulse dropped below 50 were given intravenous atropine. In individuals who were having VAS of more than or equal to 3 were administered an additional dose of intravenous tramadol.

Statistical analysis: Data obtained were tabulated and analyzed using Statistical Package for Social Science (SPSS) software.

Results:

100 females of ASA grade 1 & 2 who were undergoing elective gynecological surgical intervention were studied. As this is a comparative study, to make it more impartial we kept the number of cases of the type of surgical procedure same in each group.

Table 2: Types of gynaecological procedures performed

Type of gynecological procedure performed	Group I (n=50)	Group II (n=50)
Abdominal hysterectomy	22	28
Vaginal hysterectomy	16	14
Laparotomy for ovarian mass	14	12
Tubal recanalization	8	6

Table 2 shows that abdominal hysterectomy was the most commonly performed procedure in both the groups

Table 3: Characteristics of spinal anaesthesia

Variable (min)	Group I	Group II
Time of onset of sensory block	3.62±0.66	2.74±0.24
Time of onset of motor block	4.16±0.62	4.52±0.82
Time to reach max. sensory level	7.58±1.34	7.64±1.54
Duration of sensory block	344.72±43.57	410.11±14.28
Duration of motor block	212.13±26.71	344.10±65.12
Duration of spinal anaesthesia	378±24.1	514.63±10.32

Table 3 clearly shows that in group II where dexmedetomidine was used in combination with bupivacaine, comparatively sensory block was earlier. Whereas motor block was earlier in group I where clonidine was used in combination with bupivacaine. In both the groups, time to reach the sensory level was somewhat similar. But when we compare the duration of sensory block, duration of motor block & finally the duration of spinal anesthesia, dexmedetomidine definitely have an upper edge over clonidine. In our study, none of the female experienced any kind of respiratory distress & sp02 of all of them was constantly maintained above 96%. During the whole surgical duration, VAS scores were less than 3 in all the cases.

Discussion

As our knowledge regarding pharmacology of the anesthetic drugs advanced, the pain management got revolutionized. Many anesthetic agents in combination have been tried and used with local analgesics with the sole goal of improving the local analgesia. In our country, spinal technique of anesthesia is very commonly used due to its ease of administration, comparative rapid onset & most important that it is economical[11-14]. α2 receptor agonists when administered intrathecally have got the effective role in controlling both somatic & visceral pain. Clonidine has been in use since long but its effect is dose dependant & when used in higher doses it has got hypotensive & excess sedative effect. From the past studies, it has been proved beyond doubt that local anesthetics & α2 receptor agonists have complementary action & this in turn gives intense analgesic action[15-18]. Dexmedetomidine when compared to clonidine has got about 10 times more affinity for α2 receptor. When used in combination with bupivacaine it reduces its requirement. In current study, the duration of onset of sensory block was somewhat similar in both the groups which is in agreement with previous studies[19-21].

Conclusion

Both α2 receptor agonists are good analgesics and provide haemodynamic stability. But in our study, Dexmedetomidine has got an upper edge in its analgesic property. Hence Dexmedetomidine is a better alternative to clonidine especially in gynaecological surgical interventions due to its better analgesic quality with minimal side effects.

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