A STUDY OF EVALUATION OF EFFICACY OF CLONIDINE VERSUS DEXMEDETOMIDINE TO REDUCE SEVOFLURANE INDUCED EMERGENCE DELIRIUM IN YOUNG CHILDREN

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ABSTRACT

BACKGROUND
Emergence delirium is also called emergence agitation which occurs more frequently in children in the immediate post-operative period. It is assumed that lack of adequate pain control before emergence may be the cause of this. But other studies found that even if pain is managed properly with nerve block there were episodes of ED. Rapid emergence from anaesthesia also may be the cause of ED. Several drugs have been used as adjuvants to Sevoflurane to decrease the incidence of ED. Present study is aimed to evaluate the efficacy to two α2-receptor agonist on emergence delirium with Sevoflurane anaesthesia in paediatric day care surgery.

MATERIALS AND METHODS
After taking permission from institutional ethics committee and written informed consent from parent this study was started. This study was conducted in the department of anaesthesia, Andhra medical college Visakhapatnam from November 2015 to August 2017. During this period sixty patients were included in this study based on inclusion and exclusion criteria. Patient selected in this study were randomized and divided into two groups. Group D is dexmedetomidine group and Group C is clonidine group.

RESULTS
We have found that emergence agitation with time was less in group D than group C. At T0 min it was 8 in group D in comparison to 12 in group C, at T15 min it was nil in group D and 4 in group C.PAED score was high in group C than group D in first -20 min. At T0 it was 7.20 in group D and 10.46 in group C.

CONCLUSION
Both the drugs are agonist on α2a receptor, but affinity of dexmedetomidine is higher and it has both sedative analgesics, amnestic and sympatholytic effect. Both used to decrease severity and incidence of ED but dexmedetomidine is more effective. Dexmedetomidine also used to decrease duration of stay in PACU.

KEYWORDS
Emergence Delirium, Clonidine, Dexmedetomidine.

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Clonidine and dexmedetomidine are two \(\alpha_2\)-agonist have been found to be effect for decreasing the incidence of ED. Dexmedetomidine is eight times more selective to \(\alpha_{1a}\) receptor than clonidine, and it has both sedative analgesic, amnestic and sympatholytic effect.\(^6\)

Present study is aimed to evaluate the efficacy to two \(\alpha_2\)-receptor agonist on emergence delirium with Sevoflurane anaesthesia in paediatric day care surgery.

**MATERIALS AND METHODS**

After taking permission from institutional ethics committee and written informed consent from parent this study was started. This study was conducted in the department of anaesthesia, Andhra medical collage Visakhapatnam from November 2015 to August 2017. During this period sixty patients were included in this study based on inclusion and exclusion criteria.

**Inclusion Criteria**
- Age 3 to 9 yrs.
- Both sex,
- ASA score I/II.

**Exclusion Criteria**
- Any CNS disorder,
- Allergy to drug,
- ASA score III/IV sedative/analgesic Intake.

Patient selected in this study were randomized and divided into two groups. Group D is dexmedetomidine group and Group C is clonidine group. All the patients were evaluated pre operatively and kept nil orally for Solid 6 hour before operation and 2hr before milk. All the vital parameters were recorded before operation and patients were attached with suitable monitoring devices. Ten minute before surgery group D patient were given 0.3mcg/kg I.V dexmedetomidine and clonidine group (Group C) were given 2 mcg/kg I.V. General anaesthesia was induced with 8% Sevoflurane with \(N_2O : O_2\) (50% 50%) via face mask.

After orotracheal intubation anaesthesia was maintained with 50% \(N_2O\) in oxygen. To maintain end tidal CO2 of (35+4 mm of hg) anaesthesia was supplemented by 2% Sevoflurane.

After completion of the procedure Sevoflurane was replaced by 100% oxygen more than SL/kg. After recovery patient were transferred to post anaesthetic care unit (PACU).

Various vital parameters like heart rate, SBP, DBP, Oxygen saturation, duration of anaesthesia, duration of surgery and time of emergence of delirium was recorded.

WATChA scale was used for evaluation of incidence of emergence agitation.\(^2\) Score more than 3 considered ED.

The severity of ED was evaluated by paediatric anaesthesia emergence delirium scale (PAED) devised by Sikich and Lerman.\(^2\)

Watch scale-
1. Asleep
2. Child awake and quit
3. Cries but can be consoled.
4. Cries but cannot be consoled
5. Agitated and hits around.

| Behaviour                  | Nil | Just a Little | Quite a Bit | Very Much | Extremely |
|----------------------------|-----|---------------|-------------|-----------|-----------|
| Make eye contact with care giver. | 4   | 3             | 2           | 1         | 0         |
| Actions are purposeful     | 4   | 3             | 2           | 1         | 0         |
| Aware to surrounding       | 4   | 3             | 2           | 1         | 0         |
| Restless                   | 0   | 1             | 2           | 3         | 4         |
| Inconsolable               | 0   | 2             | 2           | 3         | 4         |

Table 1. Paed Score

**RESULTS**

Both the group were comparable to each other respect to age, body weight, height, ASA status, duration of anaesthesia and duration of surgery.

| Variables            | Group D | Group C | \(P\) Value |
|----------------------|---------|---------|-------------|
| Age (years)          | 6.4     | 5.6     | 0.402       |
| Body weight          | 23.4    | 2.6     | 0.216       |
| ASA                  | I       | 22      | 26          | -         |
|                      | II      | 8       | 4           | -         |
| Height (CM)          | 116.2   | 114.2   | 0.124       |
| Duration of anaesthesia (min) | 56.42 | 54.36 | 0.116      |
| Duration of surgery in mins | 34.26 | 32.6  | 0.212      |
| Time of emergence. In min | 14.20 | 9.80  | <0.05      |
| Duration of stay in PACU | 38.80 | 40.64 | >0.05      |
| Nausea and Vomiting   | 2       | 8       | -           |

Table 2. Demography of Two Groups (D And C)
As per table 2 time emergence was 14.20 min group D in comparison to 9.80 min group C, which significantly longer in group D. Duration of stay in PACU longer in group C that is 40.64 min, which is 38.80 min group D. Incidence of vomiting was more in group C than group D.

As per table 3 we have found that emergence agitation with time was less in group D than group C. At T0 min it was 8 in group D in comparison to 12 in group C, at T15 min it was nil in group D and 4 in group C.

As per Table -3 severity PAED score was high in group C than group D in first -20 min. At T0 it was 7.20 in group D and 10.46 in group C.

DISCUSSION
Emergence delirium is associated with paediatric day care surgery and aetiology of it is not clear. Rapid induction and recovery, lack of proper pain control and low lipid solubility of Sevoflurane are some causes. Various drugs are used to treat ED are available. Clonidine and dexmedetomidine are two α2A agonist is used for treatment of ED. In our study we have evaluated both the drugs on two groups of patients who were comparable to each other.

We have found that duration of stay of patients in PASU was longer in clonidine group than dexmedetomidine but not significant, which is similar to the study of Di, M Huang et al. and Heinmiller.

In our study we have found that nausea and vomiting was more in clonidine group which is similar to the finding of Malviya et al. The mean time for emergence was longer in dexmedetomidine group than clonidine group, which is similar to the finding of Ibacache et al. We have also found that incidence and severity of ED was decreased more in group D than group C, which similar to the finding of Hamsy et al and Zhang et al.

CONCLUSION
Both the drugs are agonist on α2A receptor, but affinity of dexmedetomidine is higher and it has both sedative analgesics, amnestic and sympatholytic effect. Both used to decrease severity and incidence of ED but dexmedetomidine is more effective. Dexmedetomidine also used to decrease duration of stay in PACU.

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