A PROSPECTIVE RANDOMISED COMPARATIVE STUDY OF EVALUATION OF EFFECT OF PROPOFOL AND DEXMEDETOMIDINE TO REDUCE SEVOFLURANE INDUCED EMERGENCE AGITATION IN YOUNG CHILDREN UNDERGOING DAY CARE SURGERY

S. Ch. S Ramkrishna1, Y. Kalyan Chakravarty2, A. S. K. Rao3, Anand Acharya4

1Assistant Professor, Department of Anaesthesia, Konaseema Institute of Medical Sciences, Amalapuram.
2Associate Professor, Department of Anaesthesia, Konaseema Institute of Medical Sciences, Amalapuram.
3Dean and Professor, Department of Anaesthesia, Konaseema Institute of Medical Sciences, Amalapuram.
4Professor and HOD, Department of Pharmacology, Konaseema Institute of Medical Sciences, Amalapuram.

ABSTRACT

BACKGROUND
In children Sevoflurane is associated with delirium upon recovery from anaesthesia, cause is not clear. It is called emergence delirium or emergence agitation. This is usually seen in first thirty minutes and it is described as a disturbance in children awareness and attention to environment with disorientation and perceptual alterations including hypersensitivity to stimuli and hyperactive motor behaviour in the immediate post anaesthesia period. Propofol is effective in preventing emergence agitation (E.A). Dexmedetomidine is reported to reduce the frequency of EA. So we have conducted a study to evaluate, the efficacy of propofol in comparison with dexmedetomidine, to reduce the Emergence agitation with Sevoflurane anaesthesia in paediatric patients.

MATERIALS AND METHODS
Patient selected for this study were randomly divided in to two groups, group A, is a propofol group, group B is dexmedetomidine group. The severity of EA was evaluated by using paediatric anaesthesia emergence delirium scale (PAED) devised by Sikich and lerma. Incidence of emergence agitation and PAED score were noted every 5 min up to first 30 min.

RESULTS
Regarding Incidence of emergence agitation and PAED score, we have found that number of patient with emergence agitation was more in propofol group than dexmedetomidine group at T0, T5, T10, T15 and T20 but not at T30. Accordingly the PAED score was high in group A that is propofol group then group B at T0, T5, T10 and T15 but at T20 and T30 it was same in both the group.

CONCLUSION
We have found in our study that dexmedetomidine is more effective than propofol in reducing the severity and incidence of emergence agitation. There is no significant difference in the duration of stay in patient in PACU but time of emergence was also delayed in dexmedetomidine Group.

KEYWORDS
Emergence Agitation, Dexmedetomidine, Propofol.

anaesthesia period. It is self-limiting, without any long term sequelae. 2

But this short term episode can cause harm to patient and dissatisfaction to parent. Although the aetiology is not known but it is assumed that adequate pain control can reduce this episode. Various drugs have been evaluated for reducing this episode i.e. ketorolac, clonidine, midazolam, ketamine propofol and dexmedetomidine.

Propofol is short acting parenteral anaesthetic agent acts on GABAA receptor seems to be effective in preventing emergence agitation (E.A).3 Dexmedetomidine is a centrally acting specific α2-α adreno receptor agonist causes sedation and analgesia. Sympathetic response to stress and noxious stimulus get blunted. It is reported to reduce the frequently of EA,3

So we have conducted a study to evaluate, the efficacy of propofol in comparison with dexmedetomidine, to reduce the Emergence agitation with Sevoflurane anaesthesia in paediatric patients.

MATERIALS AND METHODS
This study has been conducted in the dept. of anaesthesia Konaseema institute of medical science Amalapuram. It is a prospective randomized comparative study conducted during April 2014 to June 2017. Prior approval was taken from institutional ethics committee. A written informed consent was obtained from parent on pre designed consent form. A total of sixty patients during a period of 3 Yrs. were randomly selected for this study as per inclusion and exclusion criteria.

Inclusion Criteria
• Age:- 2 to 9 years.
• Sex:- Both.
• ASA score I, II.

Exclusion Criteria
• ASA score III, IV.
• Allergy to drugs.
• Any sedative or analgesic intake
• Any developmental disorder, Mental or neurological disorder.

Patient selected for this study were randomly divided in to two groups, group A, is a propofol group, group B is dexmedetomidine group. All the patients were evaluated preoperatively and were kept nil by mouth for solid and milk for 6 hr and 2 hr before from clear fluids.

In the operation theatre, the patients were attached with electro cardiomgram, and multipara monitor and baseline values were recorded. All the vital parameters were recorded during whole procedure.

General anaesthesia was induced with 8% Sevoflurane with 60% N2O in oxygen, via face mask. After orotracheal intubation anaesthesia was maintained with 60% N2O in oxygen. To maintain end-tidal CO2 of (35+4 mm of Hg) anaesthesia was supplemented by end tidal concentration of 2% Sevoflurane.

All the patients were given medication for control of pain and vomiting in post-operative period.

Just 10 min before surgery patient in group A were given Propofol 1 mg/I.V. and group B were given 0.3 µg/kg diluted in 10 ml NaCl 0.9%. After completion of the procedure Sevoflurane was replaced by 100% oxygen more than 5L/kg. When patient showed adequate recovery then transferred to post anaesthetic care unit (PACU).

Various parameters like heart rate, systolic BP, DBP, oxygen saturation duration of anaesthesia, duration of surgery, and time of emergence are recorded.

For evaluation of incidence of emergence agitation, the Watcha scale was used. 4
1. Child sleeps
2. Child awake and quietly.
3. Cries but can be consoled
4. Cries but cannot be consoled.
5. Agitated and Hits around.

Score more than 3 considered EA (Emergence agitation). The severity of EA was evaluated by using paediatric anaesthesia emergence delirium scale (PAED). Devised by Sikich and lerman.5 Incidence of emergence agitation and PAED score were noted every 5 min up to first 30 min.

Results
All the patients in two groups were comparable with respect to age, sex, weight and height. The difference in distribution of all these variables were not significant statistically P value>0.05. With regard to duration of anaesthesia and duration of surgery all the patients in both the groups were comparable. In group A mean duration of anaesthesia was 52.3 min and group B it was 53.76 min, similarly the mean duration of surgery in group A was 30.26 min in group B it was 32.40 min which was not significant statistically P value >0.05.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group A (mean)</th>
<th>Group B (mean)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>4.30</td>
<td>4.63</td>
<td>0.47457</td>
</tr>
<tr>
<td>sex</td>
<td>12/8</td>
<td>13/7</td>
<td>0.777634</td>
</tr>
<tr>
<td>weight</td>
<td>18.94</td>
<td>18.53</td>
<td>0.0120985</td>
</tr>
<tr>
<td>height</td>
<td>115.8 cm</td>
<td>118.90 cm</td>
<td>0.135908</td>
</tr>
<tr>
<td>Duration of anaesthesia (in mins.)</td>
<td>52.3</td>
<td>53.76</td>
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</tbody>
</table>
The duration of emergence was more in dexmedetomidine group than the propofol group, and was significant statistically. The mean duration of emergence in group B was 13.64 min and group A it was 10.62 min. Regarding duration of stay patient in the PACU was almost same for both the group there was no gross difference.

As per table -3 regarding incidence of emergence agitation and PAED score, we have found that number of patient with emergence agitation was more in propofol group than dexmedetomidine group at T0, T5, T10, T15 and T20 but not at T30. Accordingly the PAED score was high in group A that is propofol group then group B at T0 ,T5 ,T10 and T15 but at T20 and T30 it was same in both the group.

DISCUSSION
As we know that emergence delirium is self-limiting that develop during recovery from anaesthesia but exact aetiology is still unclear. It has been found in various studies that Sevoflurane is associated more frequently with the development of anaesthesia; cause may be its low solubility, rapid induction and recovery. Various drugs have been used for the prevention of emergence agitation. In our study we have evaluated the comparative efficacy of propofol and dexmedetomidine on two groups of patients who were comparable to each other. We have found that duration of stay of patient in PACU is more in propofol group than dexmedetomidine group but not significant statistically. The time of emergence is more in dexmedetomidine and was statistically significant, which similar to the study of various authors.

In present study, it has been found that incidence and severity of emergence agitation was reduced significantly in group B then in group A. Mean PEAD score was significantly low in group B than group A, which is similar to the study of Monaz Ali et al, Sato M et al, Mountain and Smith Sume et al.

The incidence of emergence of agitation was more in propofol group than dexmedetomidine group and is similar to the study of other authors.

CONCLUSION
We have found in our study that dexmedetomidine is more effective than propofol in reducing the severity and incidence of emergence agitation. There is no significant difference in the duration of stay in patient in PACU, but time of emergence was also delayed in dexmedetomidine group.

REFERENCES

Table 2. Demographic and Anaesthetic Data of the Patients

<table>
<thead>
<tr>
<th>Time of emergence (in mins.)</th>
<th>Group A (n=30)</th>
<th>Group B (n=30)</th>
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<tbody>
<tr>
<td>30.26</td>
<td>10.62</td>
<td></td>
</tr>
<tr>
<td>32.40</td>
<td>13.64</td>
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<tr>
<td>38.66</td>
<td>36.42</td>
<td>≥0.05</td>
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</table>

Table 3. Comparison Between the Incidence of Emergence Agitation and PAED Score Between Two Groups

<table>
<thead>
<tr>
<th>Incidence of Emergence Agitation (Number)</th>
<th>Group A (n=30)</th>
<th>Group B (n=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>T5</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>T10</td>
<td>6</td>
<td>3</td>
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<td>T15</td>
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<td>T20</td>
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<td>0</td>
</tr>
<tr>
<td>T30</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3. Comparison Between the Incidence of Emergence Agitation and PAED Score Between Two Groups
