Research Article

Magnesium sulphate versus Dexmedetomidine on the incidence of hemodynamic changes using sevoflurane anaesthesia in children

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Abstract
Background: our study investigated the effects of intra-operative magnesium sulphate Versus Dexmedetomidine administration on the incidence of hemodynamic changes in children undergoing one day surgery using sevoflurane anaesthesia. **Patients and Methods**: A total of 60 children, ASA grade I and II, aged 3-7 years of both sexes, scheduled to undergo short elective surgeries under general anesthesia using sevoflurane, they devided into three Group I (**C**): received 10 ml normal saline, Group II (**M**): received Magnesium sulphate 30mg/kg, Group III (**D**): received (0.5 mcg/kg) Dexmedetomidine (diluted in normal saline10ml). **Results**: mean arterial pressure (**MAP**) they decreased after induction in all groups with no significant differences among them or significant differences when compared to base line values, Comparison of the heart rate **(HR)** between the groups showed significant decrease after induction in comparison with base line values. After induction, HR values significantly decreased in the three groups in comparison with the baseline level, In addition, there were significant decrease in H.R with group (D) after induction in comparisons to other groups. **Conclusions**: dexmedetomidine better hemodynamic stability than magnesium sulphate.
KeyWords: Intra-operative, Dexmedetomidine, hemodynamic

Introduction
Emergence agitation is characterized by a period of restlessness, agitation, inconsolable crying, disorientation, delusion, hallucination and cognitive changes plus memory impairment. EA in children is agitation during recovery that may be associated with many risks, including injury to the child himself/herself or to the surgical site anxiety for the parents, and requires extra nursing care. (Silva et al., 2008).

Sevoflurane is widely used in pediatric anesthesia because of fast and well-tolerated inhalational induction, low hepatotoxicity, hemodynamic stability, and rapid emergence from anesthesia, However, the occurrence of Emergence agitation (Dahmani et al., 2010).
Dexmedetomidine, is highly specific α2-adrenoreceptor agonist with sedative and analgesic properties without significant respiratory depression at clinical dosages it is reported also, significantly reduces EA frequency after sevoflurane anesthesia in pediatric surgery. (Ibacache et al., 2000)

Magnesium sulphate is a nonanaesthetic N-methyl-D-aspartate receptor antagonist, which is increasingly used in adults as an anaesthetic and analgesic sparing medication, with controversial clinical effectiveness. There is a paucity of reports describing the analogous use of magnesium sulphate in the paediatric anaesthesia (Albrecht E et al., 2013.)

Patients and methods
This study was approved by institutional ethics committee of El-Minia university hospital. following approval from the local ethical committee and written consents obtained from all patients' parents prior to participate into the the candidate that involved were 60 children of both sexes ,scheduled For one day surgery under G.A using Sevoflurane, ASA: Group I or II. A careful medical history was taken from the parents. Then, general examination including (HR, body Temp., BP, RR) including

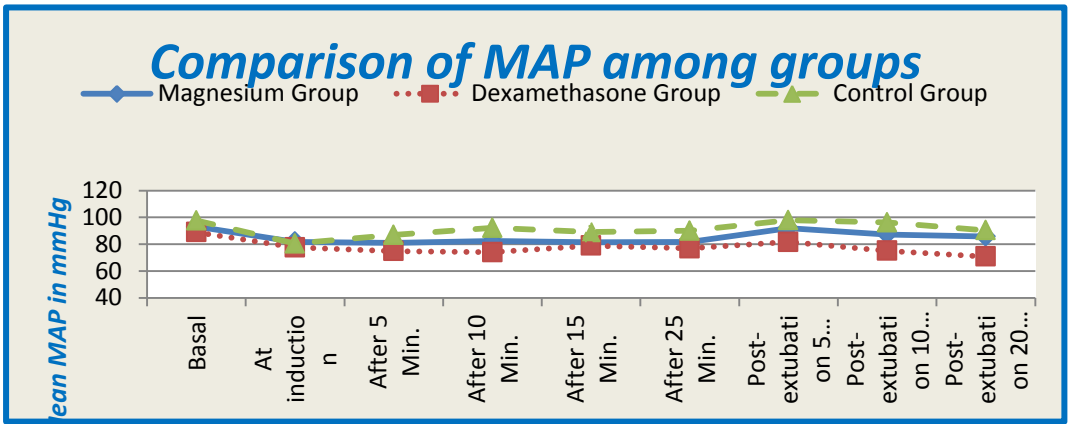
pulse, arterial blood pressure a and local physical examination including (chest, heart,

abdomen and other systems) were done Group I (**C**): received 10 ml normal saline, Group II (**M**): received Magnesium sulphate 30mg/kg, Group III (**D**): received (0.5 mcg/kg) Dexmedetomidine (diluted in normal saline10ml).

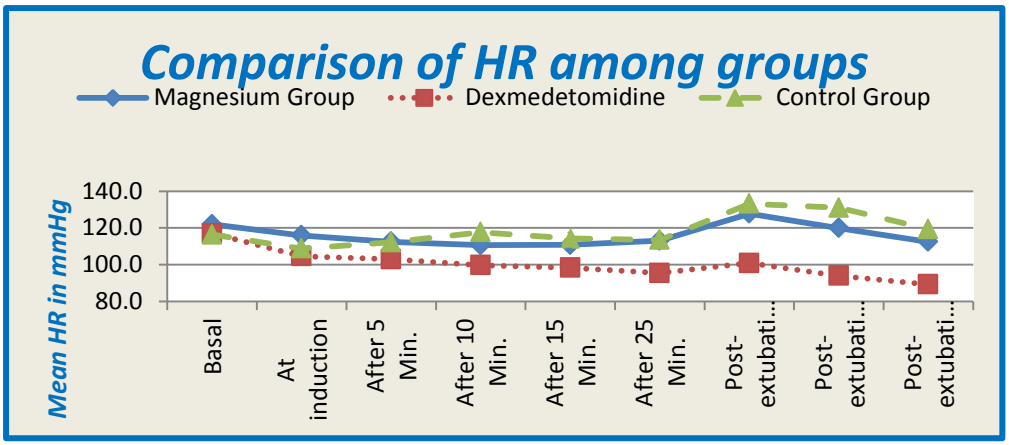
Results

Mean changes in mean arterial pressure MAP are shown in Table within group comparisons in group [M] baseline value was 93.2±7.5 all values reported throughout the study period .was comparable to baseline value, there were significant reducion in mean values immediately after induction and after 20 post extubation it was significantly increased 5 min. after extubation. In group [D] baseline value was all recorded values 88.9±10.4 were significantly lower than baseline throughout all the study period. In group [C] baseline value and there 97.6±8.5 were no significant reduction in mean values immediately after induction or after exubation.Between groups comparisons, baseline values of all groups were comparable.

Between group [M] & [C] there were significant reduction in values of group [M] from time of induction till the 20 after extubation . While between group [D] & [C] all values were significantly reduced in [D] from time of induction till the 20 after extubation.
While between group [D] & [M] all values were significantly reduced in [D].



Comparison of the heart rate **(HR)** between the groups showed significant decrease after induction in comparison with base line values. After induction, HR values significantly decreased in the three groups in comparison with the baseline level, In addition, there were significant decrease in H.R with group (D) after induction in comparisons to other groups.



Discussion

Another Study by Yuen VM et al., 2012 they used intra-operative intravenous infusion of dexmedetomidine at (0.2–1.0 lg.kg_1.h_1) has been reported to reduce the incidence of emergence delirium, (Chen JY et al., 2013) in this study tried a single bolus dose of(0.3 lg.kg_1) dexmedetomidine the incidence of emergence delirium was decreased by 7%. The overall incidence of emergence delirium in this study was high.and this similer to our results. But different in dose. Abdulatif M et al., 2013 carried out Randomized, controlled, double-blind study investigated the effects of intraoperative magnesium sulphate administration on the incidence of emergence agitation in children undergoing adenotonsillectomy using sevoflurane anesthesia. Seventy children were randomly allocated to receive a 30 mg.kg_1 bolus of intravenous magnesiumsulphate after induction of anesthesia followed by a continuous infusion of 10 mg.kg_1.h_1 or an equal volume of saline 0.9%. All children received titrated sevoflurane anaesthesia adjusted to maintain haemodynamic stability. Emergence agitation was more common in the control group than in the magnesium group .This study is different as they didn't use muscle relaxant .and this study result were near to our results but they used Mgso4 infusion instead of bolus dose.

References

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