Intramuscular Dexmedetomidine Versus Midazolam as a Premedication Before Surgery

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**ABSTRACT**

Getting comfort and solace is an increasingly important idea in 21st century. The getting of progressing development and capacities directly deals with an unrivaled choice for pediatric surgeries. It was a randomized, twofold outwardly disabled, comparable equivalent social affair study including 60 patients, spread also 30 each in Group 1 (concentrate calm Midazolam) and Group 2 (control pack Dexmedetomidine). Sedation achieved in the dexmedetomidine pack was more than that practiced in the midazolam gathering. Extremely (90% versus 56%) P regard 0.0074 was found. 21 out of 30 in the midazolam pack achieved honorable parent piece disquiet score took a gander at and 28 out of 30 in the dexmedetomidine gathering. 18 out of 30 in the midazolam pack achieved exceptional spread request score and 27 out of 30 in the dexmedetomidine achieved tasteful spread affirmation score. An unquestionably fundamental number of youths in pack Dexmedetomidine achieved beguiling spread validation score of 1 or 2 when isolated and bunch Midazolam. Wake up score were desperate down where 14 out of 30 in the midazolam get cultivated great wake together score. A consistently noticeable number of children in wrap Dexmedetomidine achieved wake up score of 1 or 2 when isolated and pack Midazolam. Post usable absence of wretchedness was less required in the dexmedetomidine gathering. Study was viewed as that Dexmedetomidine can be used as an unmatched drug broke down than midazolam as an intramuscular premedication in pediatric age.

**INTRODUCTION**

Relentless comfort and solace is an increasingly imperative idea in 21st century. The acquiring of progressing development and aptitudes by and by bears a prevalent choice for pediatric surgeries. To organize this target headways in system of sedation gets mandatory. Difficult issue with pediatric age pack is preoperative crying, fomentation, apprehension, fear with essentialness during division from watchmen which recognizes amazing difficulty in ensuring about an iv line or utilization of spread before certification of sedation. Elements, for instance, situational eagerness of the mother, way of the child, age of the youthful, and nature of past clinical encounters envision an adolescent’s preoperative anxiety (Kain, 1996). Preoperative anxiety has been seemed to yield the assertion of sedation (Kain, 1996) and enact the nearness of stress hormones, which can decimate recovery (McCann and Kain, 2001). Justus, R, in their fair examination, collected five pieces of the cautious experience that can call pressure in kids: (a)
physical underhandedness or genuine injury as torment, mutilation, or even annihilation; (b) bundle from watchmen and nonappearance of trusted in adults, especially for preschool kids; (c) fear of the dull and new; (d) absence of security about “satisfactory” and regularizing conduct in a crisis place setting; and (e) loss of control, self-rule, and competence (Justus et al., 2006). Rise fomenting sway (EA) from sedation is essential in kids, especially in the preschool age pack who experience general sedation. It has been portrayed as a mental upsetting impact during the recovery from general sedation and can contain mental excursions, dreams and strife in the child. To the parent or watchmen this may be seen as moaning, tension, programmed physical activity and thrashing uncontrollably in bed and can achieve considerable injury. Some disrupted adolescents may hold striking memories about their negative experience arousing from sedation. This can realize watching new practices by the child, for instance, anxiety, evening time crying and temper tantrums. For preoperative sedation and anxiolysis, midazolam (benzodiazepine) is utilized IntraMuscularly in association for decades. When managed preoperatively, the medication assuages uneasiness and gives sedation, and anterograde amnesia of perioperative occasions. Midazolam has been controlled orally as a trancelike for the transient administration of a sleeping disorder. Dexmedetomidine is a strong and exceptionally particular alpha - 2 adrenoreceptor agonist, as of late brought into clinical practice for sedation and absense of pain. Intra solid Dexmedetomidine is being considered as a premedication in pediatric age bunch with a guarantee to create sedation, anxiolysis and doesn’t deliver respiratory sorrow. It furthermore possibly lessens hard and fast opiate usage in perioperative period. Over the latest couple of years it has ascended as a promising remedial prescription in wide extent of narcotic organization for benefits in the perioperative periods. This assessment evaluations and looks at the adequacy of midazolam and dexmedetomidine when utilized intramuscularly as a premedication in pediatric clinical procedures.

MATERIALS AND METHODS

Study was done in Department of Anesthesiology, KIMS, Karad during a period November 2013-May 2015. The examination was led after the endorsement of moral council of the establishment. randomized, twofold outwardly impaired, relative examination including 60 patients, surrounded nearly 30 each in Group 1 (study) and Group 2 (control). No previous premedication was given. Randomized, twofold outwardly debilitated, close to approach gathering Equal number of patients which were between the age groups of 3-14yrs (14- 45kg) were given inj. dexmedetomidine 1.5mcg/kg and midazolam 0.05mg/kg intramuscularly. Sedation score using Ramsay sedation scale was recorded for the period of 45 minutes in the preoperative room. Parent separation anxiety score was also recorded. Mask acceptance was compared between the two groups. Waking up behavior was recorded by wake up score. The patient was monitored for 6 hours post operatively and analgesia requirement along with time for first analgesia need in each group was noted.

Anaesthesia Technique

No kid got any premedication before appearance in the Preoperative room. On appearance in the pre-activity room coming about to surveying as far as possible, intramuscular premedication was given by a related anaesthetist according to randomization, who didn’t take an interest any further in the main spot of study. After 45 min patient was moved to activity theater, a standard strategy for lead of sedation was kept up for all the patients. After arrangement of routine checking every youngster got an intravenous cannula and was given 1 µg/kg of intravenous fentanyl, sedation was actuated by breathed in sevoflurane 2-5% in oxygen utilizing an altered Jackson Rees sedation framework by means of straightforward face cover kept tenderly on face. Endotracheal intubation was acted in all cases without the guide of muscle extricating up and sedation, starting there on remained mindful of sevoflurane (2-4%) in nitrous oxide (60%) and oxygen (40%) at normocapnia as picked by consistent end-spilling CO2 viewing. A normalized intraoperative intravenous implantation was begun utilizing Ringer’s lactate arrangement at a pace of 4 ml/kg/hr.

OBSERVATION AND RESULTS

The subjects were divided into two groups according to the randomization number used by fellow resident which was decoded during the time of analysis of the data as

Group 1 got Inj. Midazolam intramuscularly 0.05mg/kg as a premedication Group 2 patients got Inj. Dexmedetomidine intramuscularly 1.5mcg/kg as a premedication.

According to Ramsay sedation score

Logically 17 patients out of 30 in the midazolam pack achieved good sedation meandered from 27 in the dexmedetomidine gathering. Sedation achieved
in the dexmedetomidine bundle was more than that cultivated in the midazolam gathering. The sedation scores were genuinely colossal in the dexmedetomidine bundle appeared differently in relation to the midazolam pack P regard 0.0074 95% conviction length 0.4504 to 0.8802 Relative Risk: 0.6296.

**Parent Separation Anxiety Score**

21 out of 30 in the midazolam pack achieved pleasant parent segment anxiety score. 28 out of 30 in the dexmedetomidine achieved satisfactory parent separation apprehension score. A progressively irrefutable number of adolescents in pack Dexmedetomidine achieved mind boggling Parent bundle anxiety score of 1 or 2 when isolated and bunch Midazolam. P regard: 0.0419 95% assurance range: 0.3418 to 0.8027 Relative Risk: 0.5238 There were no vital differences between bundles in design preoperative heartbeat, circulatory strain and oxygen submersion prior and after premedication.

**Mask Acceptance Score**

18 out of 30 in the midazolam pack achieved exquisite spread request score. 27 out of 30 in the dexmedetomidine achieved inconceivable spread affirmation score. A constantly conspicuous number of adolescents in bunch Dexmedetomidine achieved remarkable spread accreditation score of 1 or 2 when isolated and pack Midazolam. As showed up by the table and diagram, spread request score assessment was basic. P regard: 0.0153 95% assurance stretch: 0.4862 to 0.9141 Relative Risk: 0.6667 During iv cannulation, in the movement theater youths in dexmedetomidine pack were progressively pleasing when stood out from the children in the midazolam gathering.

**Wake Up Score**

14 out of 30 in the midazolam wrap achieved brilliant wake up score. 28 out of 30 in the dexmedetomidine achieved unfathomable wake up score. An inflexibly fundamental number of young people in get Dexmedetomidine achieved charming wake together score of 1 or 2 when isolated and pack Midazolam. As demonstrated by the table and graph, Wake up score relationship was important P regard: 0.0001 95% sureness range: 0.2372 to 0.5928 Relative Risk: 0.3750.

**No of Patients Requiring Post Operative Analgesia**

lesser number of adolescents in pack Dexmedetomidine required postoperative absense of agony rescue estimations when differentiated and bundle Midazolam. Score of >=4 recievediv fentanyl 0.5mg/kg as a rescue dose. According to the table and graph, FPS-R score comparison is statistically significant till 3 hours. After 3 hours FPS-R score comparison for post operative pain becomes insignificant. In group dexmedetomidine 3children required postoperative analgesia in the first hour,while 5 required in the second hour compared to 24 children in the midazolam group in the first hour and 2 in the second hour. None of the young people in either pack had any responses like hypotension, bradycardia, spewing, incredible sedation, nasal irritation, etc.

**RESULTS AND DISCUSSION**

Midazolam is the most by and large used anxiolytic premedication in little young people. It reinforces gamma amino butyric harming (GABA) receptor-intervened chloride conductance, which inhibitirably impacts neurons in the cerebral cortex. It has been adequately used through various courses, for instance intravenous, intramuscular, oral and intranasal (Kogan et al., 2002). Starting late, α2-receptor agonists, for instance, dexmedetomidine have similarly been viewed as consistent for premedication in kids. These meds follow up on central α2 receptors arranged at the presynaptic terminal where they basically cause block of appearance of noradrenaline (Levick, 2013). The site of improvement of dexmedetomidine is in locus coeruleus where it causes EEG activity like standard rest. This results in anxiety effects, sedation and absence of destruction without over the top lack of care (Khan et al., 1999). Considering current sedation has moved far towards executing the ordinary necessity for a significant preoperative sedation (Sun et al., 2014). Various assessments have used a low part intra strong bit of midazolam 0.05mg/kg (Behne et al., 1989). Low part of dexmedetomidine of 1.5mcg/kg was used to hinder bothersome haemodynamic changes and inverse side effects (Sun et al., 2014) We have picked these measurements in the light of above examinations to avoid unwanted responses. Midazolam is the most everything thought about used master for premedication. The noteworthy issue in like manner practice while using intranasal or oral midazolam is related with a bothersome gobbling up sensation and exasperating in the nasalcavity and throat. To keep the evaluation standardized we expected to give both the cure with fundamentally undefined routes; oral dexmedetomidine openness being difficult to reach and to evade above manifestations, we chose to control the medicine intramuscularly. Narcotic effect of intramuscular dexmedetomidine is seen at 45–60 min (Jaakola et al., 1994). The patients focused over the social occasion in the current examination, didn't move much concern.
ing section factors like age, sex, weight. These limits were viewed as undefined in both the social occasion. Furthermore, both the social affairs were for all intents and purposes indistinguishable with respect to type and the term of clinical technique. All scores used for evaluation in this appraisal were standard. Sedation scores were dismantled using Ramsay sedation score (Thakurta et al., 2013), strain during area was surveyed by parent division pressure score (Mitra et al., 2014), mask affirmation was concentrated by cover verification score (Singla et al., 2015), while wake up direct was diagramed by wake up score (Pant et al., 2014). Post employable torment was explored by Face torment scale revised (Hicks et al., 2001). Our appraisal gives testimony regarding various reports isolating dexmedetomidine and midazolam premedication and found a consistent heartbeat and circulatory strain, with better parent division anxiety and essentially indistinguishable narcotic impacts. (90% versus 56%) with P regard 0.0074 was found when sedation scores were showed up contrasting comparing to reason that dexmedetomidine gathering would do well to narcotic impact Parent parcel anxiety score was better with dexmedetomidine pack stood separated from midazolam pack with p regard 0.0419(93% versus 70%) Sedative and anxiolytic effects of intramuscular dexmedetomidine and midazolam were taken a gander at, (Scheinin et al., 1993; Erkola et al., 1994) created an examination using intramuscular dexmedetomidine as premedication for general sedation isolating it and intramuscular midazolam. Dexmedetomidine and midazolam started inside and out that truly matters obscure preoperative sedation and anxiolysis. The results suggest that pretreatment with a lone intramuscular mix of dexmedetomidine is acceptable showed up differently equivalent to midazolam. In the two evaluations gigantic bradycardia was noted with hypotension with dynamically noteworthy bits of dexmedetomidine used. Our results were in like manner practically identical and equivalent wrapping up dexmedetomidine is better appeared differently in relation to midazolam as a premedication with respect to sedation and anxiolysis, at any rate haemodynamic changes and inverse side effects were not basic in our study could be a direct result of reduced estimations used in our examination.

Various assessments have been coordinated for the chance of using dexmedetomidine as premedication. In any case, bradycardia and hypotension an exceptional bit of the time happened following the premedication with dexmedetomidine, either by methodologies for intramuscular or intravenous course. This is particularly evi-
intranasal premedication in kids posted for elective surgery (Singla et al., 2015). Dexmedetomidine achieved better sedation and parental division scores than intranasal midazolam. In like way it would seem to offer some uncommon position isolated and midazolam. The above results isolating sedation and anxiolytic effects of these assessments were in concordance to our results. In our evaluation we found spread affirmation was better with dexmedetomidine bunch stood separated from midazolam pack with p regard 0.0153 (90% versus 60%). Faritus found that Dexmedetomidine demonstrated an extraordinary effect on improving the spread request lead (mean spread affirmation score 2.58 ± 0.6 and 1.6 ± 0.67 for midazolam and dexmedetomidine, unreservedly; P < 0.05) (Faritus et al., 2015). They incited that it has all the reserves of being reasonable to apply oral premedication with dexmedetomidine 45 minutes before moving the patient to the working room when the individual being insinuated is honestly masterminded to confine inside breath sedation selection.

Sheta S A coordinated a twofold blinded randomized controlled primer taking a gander at intranasal dexmedetomidine versus midazolam for premedication in kids. Satisfactory consistence with spread application was 58.3% in pack M versus 80.6% in bundle D (P = 0.035) (Sheta et al., 2014). All the above results comparing mask acceptance were similar to the results of our study concluding dexmedetomidine to be a better drug compared to midazolam. Our observation and results regarding wake up score indicate that dexmedetomidine was superior with p value 0.0001 (93% vs 46%) compared to midazolam, in this respect. In other studies conducted by (Agrawal et al., 2017) to evaluate the effects of oral dexmedetomidine, strikingly with oral midazolam. The rehash of postoperative fomentation was everything viewed as less in the dexmedetomidine gathering (23% versus 47%, P < 0.05) when showed up unmistakably as per midazolam. The paces of postoperative fomentation and shivering were from a general point of view lower in Group Dexmedetomidine isolated and group Midazolam. Another important property of Dexmedetomidine is enhancement of analgesia. Dexmedetomidine itself alone is not used as a sole analgesic agent but it enhances the analgesia of other analgesic and anaesthetic agents. It produces analgesic effects by an action on alpha2 receptors within locus ceruleus and spinal cord (Sheta et al., 2014). Stimulation of alpha 2 adrenoreceptors at this site reduces central sympathetic output, resulting in increased firing of inhibitory neurons.

The proximity of dexmedetomidine at alpha 2 adrenergic receptors in dorsal horn of spinal rope adjusts the appearance of substance P to make torment mitigating impacts. Both alpha 2B and alpha 2C receptors are postsynaptic. These receptors are mainly located in the dorsal horn of spinal cord and their activation inhibits noception.

In our assessment we found post employable absense of torment was less required in the dexmedetomidine pack appeared differently in relation to midazolam gathering. Post activity absense of torment for torment was required in only 14 patients with only 3(10%) in the essential hour while in the midazolam bundle 28 patients required post activity absense of agony with 25(80%) in the first hour. The connection for need of post usable absense of torment was inconceivably significant, between the two social occasions we analyzed. It was basic till 3 hrs, however got insignificant after 3 hours. Ghali guided an examination to consider intranasal dexmedetomidine versus oral midazolam for premedication of children. Post-operatively, a chance to achieve an Aldrete score of 10 were clinically comparable (Mahfouz et al., 2011). In like manner, the proportion of children who required fentanyl as rescue absense of torment tranquilize was ordinandy less (P=0.027) in the dexmedetomidine gathering.

CONCLUSIONS

The examination was that assumed that Dexmedetomidine can be used as a superior medicine pondered than midazolam as an intramuscular premedication in pediatric age group.

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Conflict of Interest
None to Disclose.

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