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A Comparative Study of Bolus Dose of Propofol with Equipotent Dose of Thiopentone Faciltating LMA Insertion

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Abstract

Objective: The LMA (Laryngeal Mask Airway) is a method to offer endotracheal intubation while avoiding the dangerous side effects of visualization of cords and forcing them apart. The present study is designed to compare the conditions to facilitate the insertion of LMA with the two most used agents Thiopentone and Propofol after adequate pre-induction doses of midazolam and fentanyl.

Materials and Methods: A study conducted on 60 patients of either sex belonging to 18 to 50 years of age and ASA grade 1 who were to undergo elective surgeries. Patients were randomly divided into two groups. Both groups received pre-induction doses of Glycopyrrolate (0.2mg), Midazolam (0.5mg/kg) and Fentanyl (1.5mg/kg), and were induced with either Propofol (3mg/kg) or Thiopentone (6mg/kg) to facilitate insertion of LMA.

Result: Conditions facilitating LMA insertion and ease of insertion were significantly greater in Propofol group when compared to Thiopentone group. The difference was statistically significant ($p<0.0001$).

Conclusion: In view of better ease of insertion, lesser time taken for insertion and better recovery profiles associated with Propofol seems to be superior to Thiopentone in LMA insertion.

Keywords: Laryngeal; Propofol; Mask; Airway; Thiopentone.

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Introduction

The Laryngeal Mask Airway (LMA) is a supraglottic airway device designed by British anaesthesiologist, Dr. Archi Brain. The laryngeal mask airway is inserted blindly into the hypopharynx. When the cuff is inflated, it forms a low-pressure seal around the laryngeal inlet, permitting gentle positive pressure ventilation.[2] It has revolutionized the management of patients who would otherwise have received anesthesia by the conventional face mask. It enables the anesthesiologist to have both his/her hands free. The insertion of the LMA requires the upper airway reflexes to be obtunded sufficiently, to prevent undesired patient responses like coughing,

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gagging, laryngospasm etc. If general anesthesia is used, insertion requires a depth like that necessary for insertion of an oropharyngeal airway, but not as deep as is needed for tracheal intubation.[1]

Absence of motor response to a jaw thrust is a reliable method of assessing the adequacy of depth of anaesthesia for LMA insertion.[3] Various induction agents and their combinations have been used to facilitate its insertion with least side effects. However, each of them has their own limitations, and none of them have evolved as a standard method for insertion of the LMA so far. Hence, the present study is designed to compare the conditions to facilitate the insertion of the LMA with the two most commonly used agents-Thiopentone and Propofol, after adequate pre-induction doses of midazolam and fentanyl.

Methods

The study was conducted at Vinayaka Mission's Medical College and Hospital Karaikal. This prospective study was conducted on 60 adults, ASA- Grade I patients, aged between 18 to 50 of either sex, posted for elective surgeries in general surgery, orthopedic, ENT and gynecology obstetric. Patients were randomly divided into two groups of 30 each. Group P - Propofol group.

Group T - Thiopentone group Ethical committee clearance from our college was taken and written informed consent was taken from all the patients.

Pre-anesthetic evaluation

Patients were visited on the previous day of surgery, and the procedure was explained to them. A detailed medical history was taken, and systemic examinations were carried out and relevant investigations were advised.

Patients under following categories were excluded from the study:

- Patients below 18 years or above 50 years of age.
- Morbidly obese patients.
- Patients with anticipated difficult intubations.
- Patients with history of drug allergy.
- History of upper respiratory tract infection within 10 days prior to surgery.
- Surgeries in prone position.
- Head and neck surgeries.
- Patient with history of chronic smoking. hypertension, COPD, bronchial asthma, DM, etc.

Basic laboratory investigations like complete haemogram, blood sugar, routine urine analysis, bleeding time, clotting time were carried out routinely in all patients. ECG and Chest X-ray was done in all patients above 40 years of age.

Premedication

All patients were pre-medicated with tablet Diazepam-5mg two hours prior to surgery.

Anesthetic Technique

On arrival at the operation theatre, an intravenous line was secured and the patient's baseline vital data were recorded using pulse oximeter (for oxygen saturation), ECG and NIBP. Both groups received Inj. Midazolam (0.05mg/kg) and Inj, Fentanyl (1.5mg/kg) along with Inj. Glycopyrrolate (0.2mg/kg) prior to induction. Exactly 3 minutes after the pre-induction dose of midazolam. during which the patient was pre-oxygenated the induction agent was administered by a second anaesthetist. The dose used were thiopental- 6mg/kg in Group T and Propofol-3 mg/kg in Group P. The induction agent was injected at a constant rate over 30 seconds. After 30 seconds, adequacy of anaesthesia was assessed (loss of eye lash reflex). If it was found to be adequate, LMA insertion was attempted using the standard technique. If the depth of anaesthesia was inadequate, Propofol or Thiopentone was repeated in a dose of 0.25mg/kg or 0.5mg/kg respectively. If conditions for insertion of LMA were still not satisfactory, 25mg of succinylcholine was given, and patient was ventilated with 100% oxygen using face mask and LMA was then inserted. The cuff was inflated with the recommended volume of air. Following LMA insertion, anaesthesia was maintained with 66% nitrous oxide in oxygen along with halothane (0.8% to 1%). Total dose of induction agent, including any bolus required, and time taken for successful LMA insertion from time of injection of midazolam were noted.Conditions for LMA insertion were graded on a three-point scale using six variables: Jaw opening, ease of insertion, coughing, gagging, Laryngospasm/airway obstruction and patient's movements.

Statistical Analysis

Data was analyzed using students't' test for the continuous variables (age, weight and hemodynamic parameters), and Chi-square test for categorical variables (conditions for LMA insertions). A value of $p<0.05$ was considered statistically significant.

Results

Table 1: Jaw Opening.

	Grade	Description	Group P n = 30	Group T n = 30	p Value
Jaw opening	3	Full	26	24	0.73
	2	Partial	4	6	
	1	Nil	0	0	

Jaw opening was completed in 26 patients in Propofol group compared to 24 in Thiopentone group. 4 patients in Propofol group had partial jaw opening as of 6 in Thiopentone group. But the difference between the 2 groups was not statistically significant (p value=0.73). (table 1).

Table 2: Ease of insertion

	Grade	Description	Group P n = 30	Group T n = 30	p Value
Ease of insertion	3	Easy	28	22	<0.0001
	2	Difficult	2	8	
	1	Impossible	0	0	

There was easy insertion of LMA in 28 patients in Propofol group compared 22 in Thiopentone group. It was considered difficult in 2 patients in Propofol group and in 8 patients in Thiopentone group. However, insertion was possible in all patients.

The statistical analysis by Chi Square test showed that ease of insertion was significantly better in patients who were administered Propofol compared to those given thiopentone. (p value < 0.001 extremelysignificant). (table 2).

Table 3: Coughing.

	Grade	Description	Group P n = 30	Group T n = 30	p Value
Coughing	3	NIL	30	29	0.31
	2	+	0	1	
	1	++	0	0	

Coughing was observed in one patient in Thiopentone group, and in none of the patients in Propofol group (p value = 0.31).(table 3).

Table 4: Gagging.

	Grade	Description	Group P n = 30	Group T n = 30	p Value
Gagging	3	NIL	29	27	0.12
	2	+	1	3	
	1	++	0	0	

Gagging occurred in 1 patient in Propofol group and in 3 patients belonging to Thiopentone group (p value = 0.12).(table 4).

Table 5: Laryngospasm and airway obstruction.

	Grade	Description	Group P n = 30	Group T n = 30	p Value
Laryngo-spasm and airway obstruction	3	NIL	30	26	0.12
	2	Partial	0	4	
	1	Total	0	0	

Partial airway obstruction occurred in 4 patients in Thiopentone group, but none in Propofol group (p value = 0.12).(table 5).

Table 6: Patient movements.

	Grade	Description	Group P n = 30	Group T n = 30	p Value
Patient movements	3	NIL	24	28	0.25
	2	Moderate	6	2	
	1	Vigorous	0	0	

There were moderate patient movements in 6 patients in Propofol group whereas only 2 patients had moderate movements in Thiopentone group (p value=0.25).(table 6).

Hence, it was observed that, the only parameter which was statistically significant between Propofol group and Thiopentone group was, the case of insertion of LMA. It was found to be significantly easier in patients who were administered Propofol for induction of anaesthesia.

Discussion

The laryngeal mask airway introduced in 1983 by Dr. Archie Brain has revolutionized the airway management in many patients who would have otherwise undergone endotracheal intubation or received anaesthesia through the conventional face mask.[5] This device with its ease of use helps the anaesthesiologist by keeping his hands free for other work. It also avoids the adverse effects of endotracheal intubation. With exception of ketamine all induction drugs act on respiratory center to cause respiratory depression. This effect is most profound with Propofol and a period of apnoea is usually seen.[8] Insertion of the LMA requires adequate mouth opening and obtundation of laryngeal and pharyngeal reflexes to a sufficient degree to avoid coughing or gagging which would otherwise make correct positioning difficult or even impossible.[11]

A variety of agents have been used to make LMA insertion smooth, with least side effects and cost effective. Thiopentone and Propofol are two such agents used.[6] However, both these

drugs have disadvantages when used alone. Respiratory depression and period of apnoea are most profound with Propofol.[8] Propofol markedly reduces airway and pharyngeal reflexes which makes it the ideal and most popular drug for LMA insertion.[12] However, its cardiovascular side effects especially hypotension has been a cause for concern. Propofol is generally considered the most effective agent at blocking upper airway reflexes during direct laryngoscopy or LMA placement[9]. It also produces less bronchospasm than Thiopentone and etomidate.[7] Thiopentone although a cheaper alternative for LMA insertion compared to Propofol, causes coughing, sneezing, hiccoughs and laryngospasm when employed as IV anaesthetic agent. Among these, laryngospasm is the chief complication of Thiopentoneanaesthesia. The causes of this laryngospasm include the direct effect of Thiopentone on inhibitory system of brain leaving behind the excitatory part, low dose and LMA insertion. Rarely bronchospasm is also seen with Thiopentoneanaesthesia. Vomiting and regurgitation are more likely to occur during lighter planes of anaesthesia. An effective laryngeal reflex thus confers some protection against aspiration during such an event.

Conditions for insertion of LMA

In this study, in Group P. four patients exhibited partial jaw opening, six patients showed movements, difficulty in LMA insertion was encountered with two patients and gagging was observed in one patient. In Group T. six patients exhibited partial jaw opening Coughing, gagging and partial airway obstruction were seen in one, three and four patients respectively. Three patients showed moderate movements and difficulty in LMA insertion was encountered with eight patients. It was also noted that three patients in Group P and five patients in Group T required additional dosage of the respective induction agents. This additional drug dosage requirements might have been due to the effects of lighter planes of anaesthesia. It was observed that Thiopentone group showed higher incidence of adverse effects during LMA insertion making it an unacceptable induction agent for LMA insertion. It was noticed that these adverse effects were reduced when the dose of Thiopentone was increased and when Thiopentone was supplemented with narcotics. This supplementation may however cause increased cardiorespiratory depression and delayed recovery.[4] Laryngeal reflexes are less depressed after Thiopentone administration than equivalent dose of Propofol.

The result of our study showed that Propofol is a better choice in facilitating LMA insertion when compared to Thiopentone. There was less head movement, gagging and laryngospasm and adequate relaxation was better in Propofol group.

Conclusion

In conclusion, ease of insertion of LMA was significantly greater in patients who were induced with Propofol. The time taken for insertion was also considerably less with Propofol induction compared to induction with thiopentone. However, there was no difference in the incidence of jaw opening, coughing, gagging, laryngospasm/ airway obstruction and patient movements between the two groups. The severity of undesired responses was found to be more in Thiopentone group compared to Propofol group, but they were not statistically significant. The haemodynamic parameters showed a statistically significant fall in heart rate and blood pressure in the Propofol group compared to Thiopentone group. However, these changes were not of clinical significance. Both Propofol and Thiopentone along with midazolam and fentanyl serve the purpose of insertion of the laryngeal mask airway.[14] However, in view of better ease of insertion, lesser time taken for insertion, and better recovery profiles associated with Propofol, a midazolam-fentanyl-Propofol combination seems to be marginally superior to a midazolam-fentanyl Thiopentone combination to facilitate insertion of the laryngeal mask airway.[19-20]

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Original Article

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Incidence of Neurological, Ophthalmic and Otological Symptoms in Laparoscopic Surgery in Post Operative Period: An Observational Study

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Abstract

Context: Laparoscopic surgery technique creates certain changes in various systems presenting as post-operative side effects and symptoms.

Aims: To observe incidence of post-operative neurological, ophthalmic and otological symptoms in patients undergoing laparoscopic surgery.

Setting and Design: Institutional setting, retrospective observational study

Material and methods: After ethical committee clearance, 100 patients undergoing laparoscopic surgery, meeting inclusion criteria were included in the study. Patients were monitored intra-operatively for haemodynamic changes;EtCO2, Ppeak. After extubation in post-operative period, patientswere monitored for signs and symptoms in PACU, after 4 hours and 2nd post-operative day and system specific symptoms noted.

Statistical analysis used: Data collection done using SPSS 21.0. Analysis of collected data done using independent t test, paired t test, chi-square test and Fischer's test.

Results: Out of 100 patients,36 patients showed symptoms. 8 patients had BMI >35kg/m2, 7 out of them had neurological (p value=0.14) and all 3 neurological, ophthalmic and otological symptoms. Trendelenburg combined with lithotomy position was used in 7 patients, 6 patients showed symptoms, 5 of them showed neurological symptoms (p value=0.006) and 3 showed ophthalmic symptoms (p value=0.002). Total colorectal surgeries done were 5, out of which 4 showed symptoms. Total gynaecological surgeries done were 10, out of which 7 showed symptoms, neurological=6 and ophthalmic=3. Mean duration of insufflation in neurological symptoms- 4.06hrs (p-value 0.007), for ophthalmicsymptoms-4hrs (p-value 0.334) and otological symptoms-8hrs (p-value 0.002). Certain parameters like EtCO2, Peak airway pressures, increased during insufflation and continued to remain high even after desufflation (P value=0.0001). Age of the patients, Intra-abdominal pressure (IAP) and comorbidities did not show significant impact on incidence of symptoms.

Conclusion: Trendelenburg with lithotomy position, higher BMI, longer duration of insufflation can be major factors contributing to neurological and ophthalmic symptoms in laparoscopic surgeries.

Keywords: Laparoscopic surgery; Neurological symptoms; Pneumoperitoneum; Trendelenburg's position.

Key Message: Laparoscopic surgery involves the risk of rise in ICP and IOP, susceptible patients should be screened and monitored vigilantly.

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Introduction

The use of CO_2 for pneumoperitoneum during laparoscopic surgery, positioning and insufflation for prolonged duration creates changes in various body systems. Cerebral blood flow increases by 1-2 mL per per minute for every 1mm Hg increase in partial pressure of carbon dioxide ($PaCO_2$). Trendelenburg's position can lead to increase in CVP, prolonged duration of this position can also cause cerebral edema and even retinal detachment.[1] These changes can cause post-operative symptoms suggestive of neurological, ophthalmic and otological origin leading further to symptoms. Anticipating these inevitable changes, careful screening and patient selection as well as preventive measures can improve the outcome of surgery and anesthesia.

Material and Methods

Our study was subjected to institutional ethical committee clearance and written informed consent was taken from all the patients. It was a non-interventional and observational study conducted in a multi-specialty tertiary center.100 patients of ASA I, II and III: 18-60 years age of both sexes, undergoing laparoscopic surgery of more than 1 hour duration were included. Patients were screened in preoperative evaluation for pre-existing conditions of raised ICP, IOP or inner ear diseasese.g.: glaucoma, seizure disorders, CSOM etc. During the laparoscopic surgery,hemodynamics parameters, Intra-abdominal pressure IAP, patient positions, surgical duration, Ppeak and $ETCO_2$ were monitored.

Ventilation settings were managed according to lung protection ventilation strategies. After extubation, patient's signs and symptoms were noted in post anesthesia care unit (PACU), followed by 4hours after surgery and 2nd post -operative day. Patients with positive findings were followed up further. Retrospective analysis of patients monitoring record in relation to BMI, positioning, duration of insufflation, intra-abdominal pressure (IAP) was done. Data entry was done in Microsoft excel, analysis on SPSS 21.0. Categorical values were represented as number and percentages, continuous variables as mean ± SD and median values. Quantitative variables were analysed using independent t test and paired t test, qualitative variables were analysed using chi-square/Fischer's test as applicable. P-value of <0.05 was considered significant.

Results

A total of 100 patients were part of the study with mean age of 42 years, consisting of 47 females and 53 males; 33 belonged to ASA I, 60-ASA II and 7-ASA III.

36 patients showed symptoms, out of these neurological symptoms were seen in 34 patients, ophthalmic symptoms were observed in 8 and otological was observed in 1 patient(Figure 1).

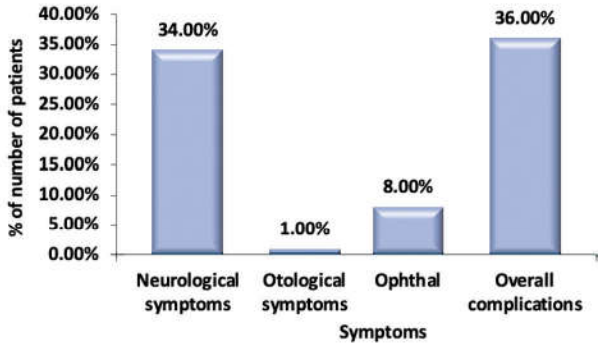

Fig. 1: Symptoms in study subjects.

In patient of age <20 years (n=3),2 patients had neurological, none of the patients had ophthalmic or otological symptoms. In 20-29 years (n=22), 8 patients had symptoms, out of which6 patients had neurological symptoms, 4 patients had ophthalmicsymptoms, none of the patients had otological symptoms; in 30-39 years (n=18), 2 patients had symptoms, both patients had neurological symptoms. In 40-49 years, age group (n=19), 10 patients had symptoms, all 10 patients had neurological, 4 patients had ophthalmicsymptoms and 1 patienthad otological symptoms; in 50-60 years(n=38), 14 patients had symptoms,all 14 patients had neurological, none of the patients had ophthalmic or otological symptoms. The difference in ophthalmic symptoms incidence in various age

Table 1: Distribution of incidence of symptoms according to age (in years).

Symptoms	<20 (n=3)	20-29 (n=22)	30-39 (n=18)	40-49 (n=19)	50-60 (n=38)	p-value
Neurological symptoms	2 (66.67%)	6 (27.27%)	2 (11.11%)	10 (52.63%)	14 (36.84%)	0.057
Ophthalmic Symptoms	0 (0%)	4 (18.18%)	0 (0%)	4 (21.05%)	0 (0%)	0.006
Otological symptoms	0 (0%)	0 (0%)	0 (0%)	1 (5.26%)	0 (0%)	0.4
Overall symptoms	2 (66.67%)	8 (36.36%)	2 (11.11%)	10 (52.63%)	14 (36.84%)	0.079

groups was statistically significant (p value=0.006) (Table 1).

Out of the total patients with symptoms, 22 females, 14 males had symptoms. (total n=36) and the difference was significant (P value=0.034), neurological symptoms were seen in 21 females, 13 males (total n=34) and the difference was statistically significant. (P value=0.034). Ophthalmicsymptoms were seen in 5 females, 3 males (total n=8), otological symptoms were seen in 1 female and none of the males, in both the cases difference was not statistically significant. In patients with <20kg/m2 BMI (n=6), 2 patients showedsymptoms, 1 neurological, 2 ophthalmic. In the BMI range 20-25 kg/m2(n=37), 10 patients had symptoms, 9 patients had neurological symptoms, 2ophthalmicsymptoms. In the range 26-30 kg/m2 (n=43), 15 patients had symptoms, 15 had neurological symptoms, 3 hadophthalmicsymptoms. In 31-35 kg/m2 (n=6) range, 2 patients had symptoms, 2 had neurological and 1 had ophthalmicsymptoms. In patients with BMI > 35 kg/m2 (n=8), 7 patients had symptoms, 7 had neurological and1 had otological symptoms. The difference amongst the different categories was significant for neurological (P value=0.014) and overall symptoms(P value=0.031) (Figure 3).

In the patients operated in lateral position, n=18, 4 patients showed only neurological symptoms. Surgery done in lithotomy position, n=2, 2 had neurological symptoms and 1 had ophthalmicsymptoms. In reverse Trendelenburg's position (n=42),16 patients had symptoms,16 neurological, 2ophthalmic and 1 otological. Patients undergoing surgery in supine position (n=20), 2 patients had onlyneurological symptoms. In Trendelenburg's position (n=11), 6 patients had symptoms, 5patients hadneurological symptoms, 2ophthalmicsymptoms. Surgery done in combined Trendelenburg's and lithotomy position (n=7), 6 patients had symptoms, neurological symptoms were seen in 5, ophthalmicsymptoms in 3. The difference in neurological (P value=0.006), ophthalmic(P value=0.002) and overall symptoms (0.001) was statistically significant (Table 2).

Fig. 2: Distribution of symptoms according to BMI in (kg/m2).

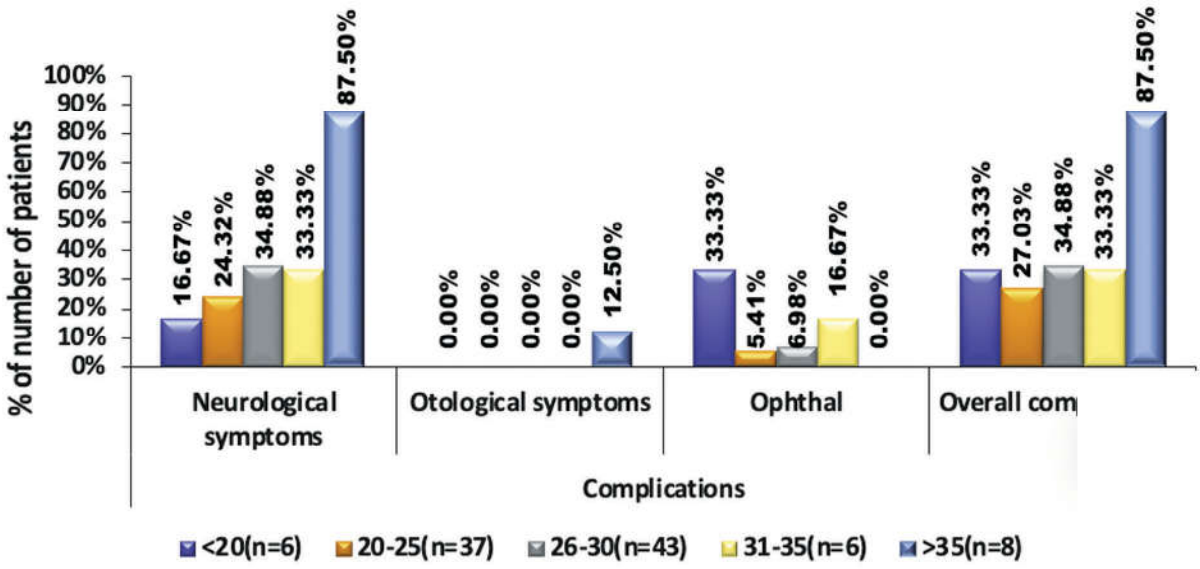

Table 2: Distribution of symptoms with different positions.

Patient position	Neurological symptoms	Ophthalmic symptoms	Otological symptoms	Overall symptoms
Lateral (n=18)	4 (22.22%)	–	–	4 (22.22%)
Lithotomy (n=2)	2 (100%)	1 (50%)	–	2 (100%)
Reverse Trendelenburg's (n=42)	16 (38.10%)	2 (4.76%)	1 (2.38%)	16 (38.10%)
Supine (n=20)	2 (10%)	–	–	2 (10%)
Trendelenburg's (n=11)	5 (45.45%)	2 (18.18%)	–	6 (54.55%)
Trendelenburg's + Lithotomy (n=7)	5 (71.43%)	3 (42.86%)	–	6 (85.61%)
p-value	0.006	0.002	1	0.001

In patients undergoing laparoscopic abdominal surgeries (n=31), 7 had symptoms, 6had neurological symptoms and 1 ophthalmic. Patients undergoing laparoscopic cholecystectomy (n=32), 11 had symptoms, 11 had neurological symptoms, 1 had neurolical and ophthalmicsymptoms. In laparoscopic gynaecological surgery patients (n=10), 7 had symptoms, 6 had neurological symptoms and 3 ophthalmicsymptoms. In laparoscopic urological procedures (n=19), 5 had symptoms, all 5 patients had only neurologicalsymptoms. In patients undergoing laparoscopic colorectal surgery (n=5), 4 had symptoms, 4 patients had neurological and 2 had neurological and ophthalmicsymptoms. In laparoscopic bariatric procedures (n=3),2 had symptoms, 2 patientsneurological and 1 had neurological and otological symptoms. The difference of symptoms in different surgeries was statistically significant (Table 3).

Table 3: Distribution of symptoms in different surgeries.

Type of surgery	Neuro-logical symptoms	Ophthalmic symptoms	Otological symptoms	Overall symptoms
Lap abdominal surgeries (n=31)	6 (19.35%)	2 (6.45%)	0 (0%)	7 (22.58%)
Lap chole-cystectomy (n=32)	11 (34.38%)	1 (3.13%)	0 (0%)	11 (34.38%)
Lap Gynaec surgeries (n=10)	6 (60%)	3 (30%)	0 (0%)	7 (70%)
Lap Urological surgeries (n=19)	5 (26.32%)	0 (0%)	0 (0%)	5 (26.32%)
Lap colorectal surgeries (n=5)	4 (80%)	2 (40%)	0 (0%)	4 (80%)
Lap Bariatric surgeries (n=3)	2 (66.67%)	0 (0%)	1 (33.33%)	2 (66.67%)
p-value (n=31)	0.023	0.011	0.03	0.015

Considering the duration of insufflation,it was found that asymptomatic patients mean duration was 3.21 ± 1.35 hours,in patients having neurological symptoms mean duration of insufflation was 4.06 ± 1.7 hours. (P value=0.007).Only 1 Patient showed otological symptom, had mean duration of insufflation of 8 ± 0 hours (P value=0.002). Patients without these symptomsduration was 3.45 ± 1.46 hours. In patients with ophthalmicsymptoms mean duration was 4 ± 2.07 hours, in patients without symptoms it was 3.45 ± 1.48 hours and in total number of patients it was 3.5 ± 1.53 hours (Table 4).

Table 4: Comparison of duration of insufflation and symptoms.

Duration of insufflation (Hours)	Absent	Present	Total	p-value
Neurological Symptoms				
Mean	3.21 ± 1.35	4.06 ± 1.7		0.007
Ophthalmic Symptoms			3.5 ± 1.53	
Mean	3.45 ± 1.48	4 ± 2.07		0.334
Otological Symptoms				
Mean	3.45 ± 1.46	8 ± 0		0.002

Mean $EtCO_2$ before insufflation was 33.45 ± 3.3 mmHg, during insufflation was 38.74 ± 4.19 mmHg and after desufflation was 35.18 ± 3.03 mmHg. The difference at all stages was statistically significant.

Table 5a: $EtCO_2$ comparison before insufflation, during insufflation and after desufflation.

$EtCO_2$ (mmHg)	Mean ± SD	Before vs During	Before vs After	During vs After
Before Insufflation	33.45 ± 3.3			
During insufflation	38.74 ± 4.19	<0.0001	0.0001	<0.0001
After Desufflation	35.18 ± 3.03			

$EtCO_2$ End-tidal carbon dioxide, SD Standard deviation.

Mean Ppeak before insufflation was 18.7 ± 2.86 cm H_2O, during insufflation was 26.94 ± 2.75 cm H_2O and after desufflation was 19.67 ± 3.06 cm H_2O. The difference at all stages was statistically significant.

Table 5b: Ppeak comparison before insufflation, during insufflation and after desufflation.

Ppeak (cmH_2O)	Mean ± SD	Before vs During	Before vs After	During vs After
Before Insufflation	18.7 ± 2.86			
During insufflation	26.94 ± 2.75	<0.0001	0.024	<0.0001
After Desufflation	19.67 ± 3.06			

Ppeak-peak airway pressure, SD-Standard deviation.

Discussion

The creation of pneumoperitoneum with CO_2, created during laparoscopic surgery and the positioning of the patient has adverse effects on the physiology of the patient. The aim of our

study was to evaluate incidence of neurological, ophthalmic and otological symptoms in patients undergoing laparoscopic surgery. The signs and symptoms suggestive of neurologicalchanges were represented by headache, nausea, vomiting, delirium, ophthalmicidentified by blurring of visionand diplopia and otological symptoms by hearing impairment and ear pain.

Cerebral blood flow (normally~50mL/100g brain tissue per minute) increases by 1- 2mL/100 g per minute for every 1mm Hg increase in partial pressure of carbon dioxide(PaCO2).The impact of $PaCO_2$ on CBF is mediated by variations in the pH of cerebrospinal fluid(CSF) around the walls of arterioles. Decreased CSF pH causes cerebral vasodilatation and increased CSF pH results in vasoconstriction creating changes in Cerebral blood volume(CBV). Autoregulation of cerebral blood flow(CBF) may be lost or impaired after administration of volatile anaesthetics. Trendelenburg is a head down position which creates pressure on the diaphragm leading to considerable reduction in lung volumes and venous stasis even with adequate ventilation. The increase in CVP causes fall in cerebral perfusion particularly if the patient is hypotensive. Prolonged head down tilt can cause cerebral oedema and retinal detachment1.Venous pressure changes are variably transmitted to the brain depending on whether the patient's position is horizontal (maximum cerebral blood volume increases) or head up(minimum CBV decreases)[2]

Mean $EtCO_2$ the difference at every stage was statistically significant with a p-value of <0.0001, which shows that there is a significant increase in CO_2 levels during insufflation and these remain to be at a high level even after desufflation and do not return to the pre-insufflation period. Umar et al3 showed that there was an immediate increase in $EtCO_2$ after insufflation continuing to increase in period of insufflation and this remained higher than baseline even 10 min after desufflation.

The difference between the peak airway pressures at different stages of laparoscopic surgeries was found to be statistically significant with p-value of levels before insufflation and during insufflation, during insufflation and after desufflation being <0.0001 in each case, that of before insufflation and after desufflation was 0.024, showing airway pressures increasing during creation of pneumoperitoneum and continued to remain significantly higher even after the procedure is done. Our study showed that across various age groups undergoing similar laparoscopic procedures, age did not have a statistically significant influence in the incidence of post-operative complications. The only significant difference seen was in the ophthalmological complications (p-value 0.006) with maximum percentage in the age group 40-49 years(52.63%).

A study conducted in 2009 by Tina T. Wong et al named "The Relationship of Intraocular Pressure with Age, Systolic Blood Pressure, and Central Corneal Thickness in an Asian Population", concluded that IOP increases till sixth decade of life after which it shows slight dip with increasing age.[4] Another study in 2016 by Adisa Adewale et al, named "Intraocular Pressure Changes with Positioning During Laparoscopy", showed an increase in IOP after induction of pneumoperitoneum and there was further rise in IOP in Trendelenburg's position.[5] In patients with pre-existing eye conditions like glaucoma, these changes have more clinical significance. Prior screening of patient in pre-operative evaluation and appropriate measures intra-operatively can prevent complications.

Obesity (BMI$\geq$35kg/m^2) showed significantly high incidence of post-operative symptoms. This is due to the fact that normal IAP in non-obese patients is 5mmHg whereas in obese individuals it is elevated at around 9-10mmHg, creation of pneumoperitoneum further accentuates it.[6]

Our study demonstrated that position of the patient during surgery plays a major role in development of neurological, ophthalmological and otological complications in the post-operative period. The incidence of neurological complications occurring in lithotomy was 100% and Trendelenburg position was 45.45% and that of the combined Trendelenburg and Lithotomy was 71.43%, which was higher than other positions with a statistical significance.The p-value for the difference in neurological complications amongst different positions was 0.06. In a study done by Halverson and colleagues[7] where they examined "effects of position during pneumoperitoneum on ICP in an experimental model" they concluded that Trendelenburg position increases ICP in addition to the ICP raised by pneumoperitoneum.

We observed that pelvic procedures like gynaecological and colorectal surgery, had higher complications as compared to other surgeries and the position in these surgeries assumed are either lithotomy or Trendelenburg's or a combination of both. It can be concluded that the neurological, ophthalmicsymptoms in post-operative period are higher in pelvic/gynaecological surgery requiring a

head low or Trendelenburg's position or lithotomy. Chin et al[8] found a significant increase in optic nerve sheath diameter (ONSD), 3 minutes after changing position from supine to steep Trendelenburg's position combined with pneumoperitoneum.

Our study demonstrated that longer surgical duration causes higher post-operative symptoms, the mean duration of surgery was significantly higher (>4hrs) in patients with post-operative symptoms as compared to those without symptoms. Hayden and Cowman[9] showed that longer duration of surgery particularly in Trendelenburg's position of >4hrs can have devastating effects and prescribed normalising position every 2hrs.

Apparently female patients undergoing gynaecological procedures showed significantly higher incidence of symptoms as compared to males. (44.68% vs 34%) with p-value of 0.034. This could be attributed to particular procedures and their position requirements during laparoscopic surgery. There was a statistically significant rise from the baseline of pulse rate (p-value <0.0001), systolic (p-value <0.0001) and diastolic blood pressure (p-value <0.0001) during insufflation which came down to baseline after desufflation (Before vs after p-values 0.301, 0.433 and 0.094 respectively).

Presence of comorbidities and Intra-abdominal pressure (IAP) changes did not show any statistically significant correlation to post-operative symptoms. Knowledge of changes in ICP and CBF during laparoscopic surgeries and their timely identification can improve the management of anaesthesia during laparoscopic surgeries and anaesthesia outcome. Our study was mixed case study including variety of cases. Study in specific laparoscopic procedure in particular age group and specific gender can give us real picture of individual factors creating changes in various systems.

Conclusion

Trendelenburg with lithotomy position, higher BMI, longer duration of insufflation can be major factors contributing to neurological and ophthalmic symptoms in laparoscopic surgeries.

Abbreviations

CO_2- Carbon Dioxide, $PaCO_2$- Partial pressure of CO_2, CVP- Central Venous Pressure, ASA grade- American Society of Anesthesiologists grade, ICP- Intracranial Pressure, IOP- Intra-ophthalmic pressure, CSOM- Chronic Suppurative Otitis Media, IAP- Intra-abdominal pressure, PACU- Post-anesthesia care unit, BMI- Body Mass Index, CBF- Cerebral blood flow, CSF- Cerebro-spinal fluid, CBV- Cerebral blood volume, $EtCO_2$- End-tidal CO_2, Ppeak- Peak airway pressure.

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Case Report

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Anaesthetic Management of Patient with Distal Radius Fracture with Ipsilateral Arteriovenous Fistula

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Abstract

Introduction: Patient with upper limb fracture with ipsilateral limb AV fistula, anaesthetic options are still challenging.

Case Report: A 40 year old male patient who is an K/C/O CKD on maintenance hemodialysis and hypertensive on medication.Patient had AV fistula on the same side of the fracture, Detailed examination of the fistula was done, 1. Thrill over the fistula palpated. 2. Bruit was auscultated on the fistula side. 3. Radial pulse was palpated for volume and rhythm. 4. Fistula hand was compared with other hand for colour , any cyanosis or pallor, temperature, ulcer, edema , pigmentation or peeling of the skin and Nicoladoni Branham sign was negative Under USG, plexus was identified. Using 23G spinal needle , Bupivacaine 0.5(H) 15ml[75mg] + LOX 2% with adrenaline 10ml [200mg+50µg]+ Dexona 8mg was given in and around the plexus . Post supraclavicular block , both sensory and motor blockade was checked. Without tourniquet surgery was proceeded , face mask with 5L/min of O2 was given to the patient. Intraoperatively patient was hemodynamically stable, maintenance fluid of 0.5ml/kg/hr. Post procedure examination of AV fistula was repeated to check the patency.

Conclusion: Use of regional anaesthesia over general anaesthesia in distal end fracture with ipsilateral AV fistula has advantage in both in management and patency of the AV fistula.

Keywords: Arteriovenous fistula; Brachial plexus block; Radius fracture.

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Introduction

Upper limb surgery are commonly performed under regional anaesthesia, with the help of USG. Nerve Blocks are relatively easy with high degree of reliability and safe option. They provide good intraoperative stability and good post operative analgesia.

Patient with upper limb fracture with ipsilateral limb AV fistula, anaesthetic options are still challenging because of hyper vascularity, haemorrhage, contraindication of using tourniquet or failure of AV fistula, intraoperative fluid management, recovery from general anesthesia and avoidance of nephrotoxic drugs.

In this case report, we have discussed about

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the anaesthetic concerns in CKD patient with AV fistula and outcome of regional anaesthesia in case upper limb fracture with ipsilateral AV fistula.

Case Report

A 40 year old male patient who is an K/C/O CKD on maintenance hemodialysis and hypertensive on medication, had an RTA and presented to hospital with pain and swelling over distal forearm , X ray showed distal end both bone fracture. Patient had AV fistula on the same side of the fracture. After admitting to the hospital, Blood investigation was sent, which showed elevated Renal function test, Nephrology opinion was taken, hemodialysis was done, On pre anaesthetic evaluation , his heart rate – 114 bpm; blood pressure was 160/100 mm Hg, all routine blood investigation were done, ECG showed normal rhythm and patient was tested negative for Covid pneumonia, history of input and output was documented.

Detailed examination of the fistula was done, 1. Thrill over the fistula palpated. 2. Bruit was auscultated on the fistula side. 3. Radial pulse was palpated for volume and rhythm. 4. Fistula hand was compared with other hand for colour, any cyanosis or pallor, temperature, ulcer, edema, pigmentation or peeling of the skin and Nicoladoni Branham sign was negative.

Patient was shifted to OT with 18G IV cannula on the opposite hand and connected to monitors. Parts were prepared and draped , under USG plexus was identified. Using 23G spinal needle , Bupivacaine 0.5(H) 15ml[75mg] + LOX 2% with adrenaline 10ml [200mg+50µg]+ Dexona 8mg was given in and around the plexus . Post supraclavicular block , both sensory and motor blockade was checked. Without tourniquet surgery was proceeded , face mask with 5L/min O2 was given to the patient. Intraoperative patient was hemodynamically stable, maintenance fluid of 0.5ml/kg/hr. Post procedure examination of AV fistula was repeated to check the patency, Both motor and sensory blockade was checked.

Discussion

Safe and effective anaesthetic management starts with detailed comprehensive preoperative evaluation. If risks identified, measures should be taken to optimize the patient and to eliminate or reduce the risk of surgery. Additionally patient should be instructed to schedule hemodialysis the day prior to the surgery.[4,5] Basic laboratory test including CBC, RFT, S. electrolyte and coagulation profile should be taken. Input and output should be recorded, if any recent fall suggestive of worsening of renal function. They may have chronic anemia due to low erythropoietin activity and coagulation profile might be altered due to platelet dysfunction.[5]

Almost all patients with CKD have multiple co morbid risk factor for general anesthesia, for that reason GA is avoided when ever possible but this may be feasible. Placing endotracheal tube over LMA have advantage in more secure airway and resulting in minimal aspiration , avoiding alkalosis that can contribute to low potassium.[1]

Using LMA has an additional advantage of not using muscle relaxants which can delay emergence from GA. During induction ,haemodynamics should be maintained , but blood pressure drops after induction due to lower vascular compliance and lower cardiac reserve function.[1]

When tourniquet is not used ,haemorrhage can be controlled using adequate electrocoagulation. Thrombosis is one of the common cause of failure of AVF followed by infection.[2] So in addition to general post operative care of distal radial fracture, condition of the AVF should be closely observed.

Conclusion

Use of regional anaesthesia over general anaesthesia in distal end fracture with ipsilateral AV fistula has advantage in both in management and patency of the AV fistula.

Conflicts of interest: nil

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Case Report

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Anaesthetic Management of an Infant with Laryngomalacia and CHD Scheduled for Rigid Tracheobronchoscopy

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Abstract

Introduction: Laryngomalacia is defined as collapse of supraglottic structures during inspiration. It is the most common laryngeal disease of infancy and cause of stridor in newborns.

Case Report: A 17 days old child (2.75kgs) with congential laryngomalacia was scheduled for rigid tracheobronchoscopy. Child had a history of recurrent lower respiratory tract infection which resolved with intravenous antibiotics and steroids. On auscultation he had no adventitious sounds when quiet but added sounds were heard when he cried.

Echocardiography showed CHD with situs solitus levocardia with 4mm ASD and 2mm PDA with dilated RA/RV. The child was administered atropine, midazolam, atracurium and ketamine. Maintainence with sevoflurane . During rigid bronchoscopy we provided adequate analgesia and sedation without clinically significant hemodynamic or respiratory adverse effects.

Conclusion: In summary we noted that ketamine provided a reliable and effective method of sedating infants undergoing a rigid bronchoscopic examination in spontaneous ventilating conditions and noted no clinically significant haemodynamic or respiratory problems. When these patients do present, their care is likely to be complex and challenging. As such , a multidisciplinary approach should be adopted throughout their period of care.

Keywords: Congenital heart disease; Laryngomalacia; Tracheobronchoscopy.

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Introduction

Laryngomalacia is defined as collapse of supraglottic structures during inspiration. It is the most common laryngeal disease of infancy and cause of stridor in newborns. Upto 20% infants with laryngomalacia presents with life threatening disease that necessitates surgical management in the setting of severe airway obstruction and feeding disorders.[1]

It presents in the form of stridor, a high pitched musical multiphase inspiratory noise appearing within the first 10 days of life. Signs of severity are present in 10% of cases -poor weight gain, dyspnoea with severe intercostal or xyphoid

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retractions, episodes of respiratory distress, obstructive sleep apnoea, and/or episodes of suffocation while feeding or feeding difficulties. The diagnosis is based on systematic laryngoscopy to confirm laryngomalacia and exclude other causes of supraglottic airway obstruction. Rigid bronchoscopy under general anaesthesia is performed only in the following cases: absence of laryngomalacia on laryngoscopy, presence of laryngomalacia with signs of severity, search for any lesions prior to surgery, discrepancy between the severity of symptoms and the appearance on flexible laryngoscopy, and/or a typical symptoms (mostly aspirations).

Administering sedation/anaesthesia for rigid tracheobronchoscopy in such a patient has potential risk of airway catastrophe. We describe the anaesthetic management of an infant with laryngomalacia who was scheduled for rigid tracheobronchoscopy.

Case Report

A 17 days old child (2.75kgs) with congenital laryngomalacia was scheduled for rigid tracheobronchoscopy. At 30 hours of life, baby had respiratory distress and noisy breathing. He was treated for diagnosis of congenital pneumonia with ASD with polydactyly. On the 10th day he developed sudden bluish discolouration of the body associated with fever and 2-3 episodes of convulsions. Child had a history of recurrent lower respiratory tract infection which resolved with intravenous antibiotics and steroids. He was intubated in view of respiratory distress. His preferential sleep posture was supine with no associated noisy breathing. On auscultation he had no adventitious sounds when quiet but added sounds were heard when he cried. Chest radiograph revealed basal lobar congestion.

Echocardiography showed CHD with situs solitus levocardia with 4mm ASD and 2mm PDA with dilated RA/RV. All standard monitors were applied including electrocardiogram, pulse oximeter, blood pressure and end tidal CO_2. His vital signs were: heart rate of 140bpm: blood pressure of 90/60mm Hg, respiratory rate of 22cpm and saturation of 94% on 2l of oxygen. Paediatric difficult airway cart with all adjuvants and alternatives to laryngoscopy and supraglottic airway devices was kept ready. Plan A was to maintain spontaneous ventilation during anaesthesia and plan B or the backup plan was to intubate the trachea with 4mm or smaller endotracheal tube as tracheal stent using propofol (2-3mg/kg) and atracurium (0.5mg/kg) followed by controlled ventilation. The child was administered 0.1mg atropine, 0.5mg of midazolam, 2mg of atracurium and 10mg of ketamine intravenously. A top-up dose of ketamine 5mg was administered. Maintenance with sevoflurane was kept at 2%. Patient was extubated during rigid bronchoscopy and then again intubated with size 3mm ET tube and fixed at 9cm after confirmation of bilateral air entry. During rigid bronchoscopy we provided adequate analgesia and sedation without clinically significant hemodynamic or respiratory adverse effects (hypotension, bradycardia, apnea, cough, wheezing). The procedure lasted for one hour.

Discussion

To understand the anaesthetic implications associated with congenital laryngomalacia, it is worthwhile to consider its pathophysiology.[2] Some authors believe that supraglottic narrowing represents either the effects of ill coordinated respiration and abnormal airflow on the soft, pliable supraglottic structures or repetitive supraglottic contractions that ultimately results in supraglottic narrowing resulting in stridor during inspiration.[3,4] Because of dynamic nature of the problem and the hypothetical neuromuscular etiology, anaesthetic technique that maintains spontaneous ventilation needs to be used.[5]

Rigid bronchoscopic examination requires special attention because of the potential risk of impaired ventilation and the difficulty in the management of airway, which is naturally occupied both by the anaesthesiologist and the surgeon. The anaesthetic agents that provide spontaneous ventilation with reduced airway and circulatory reflex have been appropriate options during the brief procedure.[6] Administration of general anaesthesia in the presence of laryngomalacia carries certain risk, the greatest of which being exacerbation of airway reactivity. Infants are at risk of apnea in the postoperative period because of immature respiratory control and laryngomalacia and other underlying conditions. Laryngomalacia with pneumonia and apnoeic episodes increase the risk of mortality and morbidity.

We chose sevoflurane because of shorter induction and recovery profile. However, the induction with sevoflurane should not be rapid as laryngomalacia is unmasked.[7] We preferred administering ketamine instead of propofol to suppress the potential response against the noxious stimuli and also provide a sedation level maintaining spontaneous ventilation. We could not detect any adverse effect on respiratory rate, end-tidal CO_2,

values and cardiovascular function as the dose we used in these patients. Neuromuscular blockade was avoided till the airway was secured with ETT in view of the neuromuscular etiology of the disorder. It is essential to observe such patients for at least overnight in the ICU for signs of obstruction and provide humidified oxygen supplementation. Postoperative analgesia becomes an integral part of the anaesthetic plan since excessive crying post operatively and excessive sedation with opioids may lead to life threatening airway obstruction.

Careful preoperative history, examination, consultation with the paediatrician and communication with the surgeon are invaluable tools in the management of such cases. Sedative pre medication is preferably avoided. Induction should be done preferably with inhalational agents and spontaneous breathing should be maintained till airway is secured. The presence of associated airway lesions can be circumvented by flexible fiberoptic bronchoscope. Recognition of state dependant laryngomalacia also helps to avoid unnecessary reintubation post operatively.

Conclusion

In summary we noted that ketamine provided a reliable and effective method of sedating infants undergoing a rigid bronchoscopic examination in spontaneous ventilating conditions and noted no clinically significant haemodynamic or respiratory problems. When these patients do present, their care is likely to be complex and challenging. As such, a multidisciplinary approach should be adopted throughout their period of care.

Conflicts of interest: nil

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Anaesthetic Management of a Patient with Parotid Abscess with Concomitant Organophosphorous Compound Poisoning

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Abstract

Introduction: Organophosphorous compounds are chemical agents in wide spread use throughout the world in agricultural industries. This poses a major challenge to an anesthesiologist; there is accumulation of acetylcholine causing overstimulation of muscarinic and nicotinic receptors disruption of transmission of nerve impulses in both peripheral and central nervous system.

Case Report: A 47 year old male presented with alleged history of OP compound consumption with complaints of pain and swelling on the left cheek. On examination Diffuse swelling with warmth and tenderness was present. A diagnosis of parotid abscess was made. Systemic examination - CNS - GCS-E4M5V4 with bilateral pupil -2mm reacting to light. Pseudo cholinesterase was 380.

Anaesthetic Management: Preloaded with 500ml RL. Monitors connected. Patient was on continuous Atropine infusion, Inj Midazolam and Inj fentanyl. Preoxygenated with 100% oxygen. Induced with Inj Propofol. Laryngeal mask airway(LMA) number 5- Proseal was inserted. Anaesthesia maintained with 50% nitrous oxide in oxygen, IV propofol with intermittent positive pressure ventilation. Inj Atropine infusion was continued at 3ml/hr and titrated according to heart rate. The haemodynamic parameters remained stable throughout the procedure. The patient was extubated, Postoperative recovery was uneventful.

Conclusion: The use of muscle relaxants can produce bradycardia and prolong the motor recovery.Volatile anesthetics can also cause bradyarrythmias. In this case report we found that patient with OP compound consumption can safely be managed under general anaesthesia with IV propofol, without muscle relaxant and inhalational volatile anaesthetics.

Keywords: Organophosphorous; Parotid abscess.

Key Messages: Organophosphorous compounds are commonly used in agricultural industries. Patients who consume them pose a major challenge to an anaesthesiologist.They have effect on both muscarinic and nicotinic receptors.In such cases with other concomitant conditions,patients can be managed successfully without usage of inhalational agents and muscle relaxants.

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Introduction

Organophosphorous compounds are chemical agents in wide spread use throughout out the world in agricultural industries. In patients who have consumed OP compound, they pose a major challenge to an anaesthesiologist as there is accumulation of acetylcholine causing overstimulation of both muscarinic and nicotinic receptors causing disruption of transmission of nerve impulses in both peripheral and central nervous system.Hence leading to airway compromises by excessive secretions and neuromuscular weakness and cardiac arrhythmias.

Case Report

A 47 year old male presented with alleged history of OP compound consumption. He also complained of pain and swelling on the left cheek. On examination- Diffuse swelling with warmth and tenderness was present.A diagnosis of parotid abscess was made. Systemic examination - CNS - GCS-E4M5V4 with B/l pupil -2mm,RTL.Other systems were normal. Routine investigations were done and was within normal limits. Pseudocholinesterase was 380.

Anaesthetic Management

General anaesthesia was planned. 18G IVC secured in right forearm, preloaded with 500ml RL. Monitoring includes pulse oximetry, ECG, non-invasive blood pressure, end-tidal carbondioxide. Patient was on continuous atropine infusion. Pre medicated with Inj Midazolam and Inj. Fentanyl. Preoxygenation done with 100% oxygen. Induced with Inj Propofol. After elimination of reflexes and reaching enough depth of anaesthesia laryngeal mask airway(LMA) number 5 Proseal was inserted and was confirmed by chest rise and $ETCO_2$, and LMA fixed in place. Anaesthesia was maintained with 50% nitrous oxide in oxygen, IVpropofol with intermittent positive pressure ventilation. Inj.Atropine infusion was continued at 3ml/ hr and titrated according to heart rate. Further analgesia was supplemented by inj Paracetamol. The haemodynamic parameters remained stable throughout the procedure. The procedure lasted for 45 min during which 2 crystalloids was given. The patient was extubated when he was awake and obeyed to open eye for command and shifted to recovery room. Postoperative recovery was uneventful.

Discussion

Organophosphorus compounds phosphorylate cholinesterase, an enzyme which hydrolyzes acetylcholine and leads to excessive parasympathomimetic activity. After examining the patient, if the patient is not adequately treated then atropine and pralidoxime should be repeated. Patient can be pre-medicated with midazolam/ diazepam if he is very restless.

Before induction Ryles tube aspiration and thorough oral suction must be done. As succinylcholine is contraindicated, non-depolarising muscle relaxant can be used for intubation. Sellick's manoeuvre is advised for prevention of aspiration. The concentration of acetylcholine is high in these patients. The relaxant of choice is pancuronium. Vecuronium may produce severe bradycardia. Inhalational agent like halothane should be used extremely carefully as chances of bradyarrhythmias are very high. Asystole and life-threatening bradycardia can occur without warning even if the patient has tachycardia. Recurrent bradyarrhythmias may be managed more easily by inserting transvenous pacing electrode.[1]

Sympathomimetics should be avoided as there is an increased susceptibility to ventricular fibrillation. Continuous cardioscope monitoring should be done. Drugs like ketamine hydrochloride and enflurane are contraindicated for fear of convulsions.

Reversal of muscle relaxant is not required as the level of acetylcholine is already very high and they may accelerate the toxicity of organophosphorus compound. Patient should be mechanically ventilated if breathing is inadequate. Postoperatively, atropinisation should be continued for seven days. Phenobarbitone or diazepam should be administered for 48 hours and pralidoxime 1 gm should be given 6 hrly for the first 24 hours.[2]

Skeletal muscle weakness appears within first 4 days. The peripheral neuropathy after poisoning may become evident within two or five weeks. The low pseudo-cholinesterase levels may persist for 15 days to one month.[3]

Conclusion

Organophosphorous compounds phosphorylate cholinesterase, an enzyme which hydrolyze Acetylcholine and leads to excessive parasympathomimetic activity. The use of muscle relaxants can produce bradycardia and prolong the motor recovery. Volatile anasthetics can also cause bradyarrythmias. In this case report we found that patient with OP compound consumption can safely be managed under general anaesthesia with IV

propofol, without muscle relaxant and inhalational volatile anaesthetics.

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Conflict of Interest: NIL

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Anaesthetic Management of Patient with Xeroderma Pigmentosum Posted for Basal Cell Carcinoma Excision

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Abstract

Introduction: Xeroderma Pigmentosum (XP) is a hereditary autosomal recessive disorder due to defect in nucleotide repair genes. In this condition patient might require multiple surgeries for removal of skin and ocular lesion.

Case report: A 17 year old male patient, weighing 43 kg presented with multiple lesions over face since 2 months. He had cutaneous lesions over full body with no major neurological deficit. General anaesthesia was planned. Patient's body protection from artificial light and eye protection given in operating room. Patient Pre medicated with Inj glycopyrrolate, Inj Midazolam and Inj fentanyl. Preoxygenation done with 100% oxygen for 3 min. Induced with Inj Propofol. After elimination of reflexes and reaching enough depth of anaesthesia laryngeal mask airway(LMA) number 3 inserted and good lung ventilation confirmed by chest rise and ETCO2 then LMA fixed in place. Anaesthesia maintained with 50% nitrous oxide in oxygen, IV Propofol with intermittent positive pressure ventilation. Further analgesia supplemented by inj.Bupivacaine 0.25% infiltration locally around wound given. The procedure lasted for 40 min.

Conclusion: Xeroderma pigmentosum patients have risk of worsening neurological disorder with genotoxic drugs and volatile anaesthesia and prolongation of recovery from muscle relaxants. In this case report demonstrated that patient with XP can safely be managed under general anaesthesia with IV propofol, without muscle relaxant and inhalational volatile anaesthetics.

Keywords: Difficult cannulation; Difficult intubation; Inhalation Anaesthetics; Propofol; Xeroderma Pigmentosum.

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Introduction

Xeroderma Pigmentosum is a rare hereditary autosomal recessive disorder due to defect in nucleotide repair genes, Characterized by sensitivity to ultraviolet radiation. UV induced skin tumors and progressive neurological complications. In this condition patient might require multiple surgeries for removal of skin and ocular lesion .Here we are discussing regarding patient diagnosed as Xeroderma Pigmentosum with basal cell carcinoma over forehead and nose posted for wide excision and anaesthetic management.

Case Report

A 17 year old male patient ,weighing 43 kg presented with multiple lesions over face since 2 months, initially smaller in size then progressed to present size 1.5 cm Patient was a known case of xerodema pigmentosa. He had cutaneous lesions such as hyperpigmentation over full body. There was no major neurological deficit and he was posted for excision of lesions.

Examination revealed no pallor, pulse rate of 80/min and blood pressure of 120/60 mmHg, respiratory rate of 18cpm and was afebrile. Systemic examination of cardiovascular, respiratory, central nervous system was normal with per abdomen examination of soft abdomen with no guarding/ rigidity. On airway examination include class 3 of mallampati Laboratory investigations were normal.

Anaesthetic Management

General anaesthesia was planned for the surgery. 20G USG guided IVC secured in right fore arm due to difficult visualization of venous access, preloaded with 500ml RL. Monitoring includes pulse oximetry, ECG, invasive blood pressure, end-tidal carbondioxide. Patient's body was covered to protect it from UV and artificial light in operating room and eye protection given. Patient was Pre medicated with Inj glycopyrrolate 0.2 mg IV, Inj Midazolam 1mg and Inj.fentanyl 80 mcg IV. Preoxygenation done with 100% oxygen for 3 min. Induced with Inj.Propofol 100mg IV.

After elimination of reflexes and reaching enough depth of anaesthesia appropriate laryngeal mask airway(LMA) number 3 was inserted and good lung ventilation was confirmed by chest rise and $ETCO_2$, and LMA fixed in place. Anaesthesia was maintained with 50% nitrous oxide in oxygen, IV Propofol with intermittent positive pressure ventilation. Futher analgesia was supplemented by Inj Bupivacaine 0.25% infiltration locally around wound given. The haemodynamic parameters were monitored which remained stable throughout the procedure. The procedure lasted for 40 min during which 1.5L of crystalloids was given. The patient was extubated when he was awake and obeyed to open eye for command and shifted to recovery room. Postoperative recovery was uneventful.

Discussion

Xeroderma pigmentosum (XP) is an autosomal recessive disease characterized by hypersensitivity to sunlight with neurological abnormalities and high incidence of skin cancer. Xeroderma pigmentosum (XP) was first described in 1874 by Hebra and Kaposi. In 1882, Kaposi coined the term xeroderma pigmentosum. It occurs in about 1:250,000 births in the U.S. and 1:40,000 in Japan could become common in racial groups in which there is consanguinity (1-5).

Patient with from XP many require proper shelding from light, avoidance of drugs which are genotoxic. Difficulties for anaesthesiologist like facial and oropharyngeal changes leads to difficult intubation, prolongation of neuromuscular effect, inhalation agents on nucleotide excision repair.

In one of the case report for elective surgery posted for excision of facial mass in the face, General anaesthesia using LMA, 2% sevofluran as a maintenance without any muscle relaxant.[6]

In one more case report, a case of XP with femoral neck fracture posted for surgical fixation, General anaesthesia performed after failure of spinal anaesthesia, used sevoflurane as a maintenance, all parameters were stable during procedure, after extubation patient had confusion, psychomotor agitation, sharpened reflexes. Here it was proven that sevoflurane had a deleterious effect on the neurological status of this patient.[1]

In another case report , patient with XP underwent laproscopic cholecystectomy had experienced transient worsening of neurological symptoms after anaesthesia with volatile agents. Hence they have used total intravenous anaesthesia(TIVA) for next surgery. Here they have proven that TIVA is better than volatile agent as a method for general anaesthesia for patient with XP.[2,3]

Patients with XP are more sensitive to muscle relaxants due to the neuronal dysfunction hence minimum use of muscle relaxants is recommended under the monitoring of neuromuscular blockade.[7]

Conclusion

Xeroderma pigmentosum patients have risk of worsening neurological disorder with genotoxic drugs and volatile anaesthesia and prolongation of recovery from muscle relaxants. At present there are no recommendatios to avoid the use of volatile anaesthetics. In this case report it was demonstrated that patient with XP can safely be managed under general anaesthesia with IV propofol, without muscle relaxant and inhalational volatile anaesthetics.

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Case Report

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Anaesthetic Management of a Patient with Endotracheal Tuberculosis Posted for Endoscopic CSF Leak Repair

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Abstract

Introduction: Patient with tracheal tuberculosis with active lung infection requiring Intubation using Double lumen Endotracheal tube pose a challenge to anesthesiologist to prevent contamination of healthy lung.

Case Report: 55 year female presented with complaints of nasal discharge for 2 weeks, cough with expectoration for one week. A diagnosis of CSF Rhinorrhoea was made. HRCT chest report showed tree in bud opacities suggestive of TB. General anaesthesia was planned. Preoperatively nebulized with Lignocaine with adrenaline; Patient was Pre medicated, Preoxygenation done with 100% oxygen. Induced with Inj Propofol. 35F Left Double lumen tube was inserted under fibreoptic guidance and was confirmed by chest rise and $ETCO_2$ and Tube fixed in place. A portable ventilator was used with Tidal volume of 5ml per kg for the right lung and regular ventilator with same tidal volume to left lung. Intra operative vitals were stable throughout the procedure. The patient was extubated after adequate spontaneous efforts. After extubation the patient started desaturating, saturation went upto 70% on room air, immediately the patient was reintubated and shifted to ICU with ET tube insitu. The patient was extubated in ICU after 2 days and shifted to postoperative ward.

Conclusion: In patients with active lung infection a plan for Double lumen ET tube may help in avoiding the infection spreading to healthy lung, intubation period is crucial to avoid most common problems such as malposition, airway trauma and tension pneumothorax caused by high ventilating pressure or large tidal volumes in patients.

Keywords: Double Lumen tube; One Lung ventilation.

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Introduction

Patient with active lung infection planned for general anaesthesia pose a challenge to anaesthesiologist to prevent contamination of healthy lung, controls distribution of ventilation and facilitate single lung lavage. Use of double lumen endotracheal tube requires skill and precision to avoid contamination and get control of differential ventilation.

Case Report

A 55 year old female presented with complaints of nasal discharge for 2 weeks, cough with expectoration for one week. No comorbidities present. On examination clear fluid of nasal discharge was present. A diagnosis of CSF Rhinorrhoea was made. Systemic examination – Respiratory System Bilateral crepitations present (right>left). Other systems were normal. Routine investigations were done and was within normal limits. HRCT chest report showed tree in bud opacities (Right>Left) suggestive of Tuberculosis (TB). AFB sputum sample also confirmed diagnosis of Active TB and she was started on Anti tubercular drugs.

General anaesthesia was planned. 18G IVCannula secured in Left forearm, preloaded with 500ml RL. Monitoring included pulse oximetry, ECG ,invasive blood pressure, end-tidal carbondioxide. Preoperatively nebulized with Lignocaine with adrenaline; Patient was Pre medicated with Inj glycopyrrolate, Inj Midazolam and Inj fentanyl. Preoxygenation done with 100% oxygen. Induced with Inj Propofol and loading dose of IV Vecuronium 5mg was given, Bag and Mask ventilation was given for 3-4mins. 35F Left Double lumen tube was inserted under fibreoptic guidance and was confirmed by chest rise and $ETCO_2$ and Tube fixed in place. A portable ventilator was used with Tidal volume of 5ml per kg for the right lung and regular ventilator with same tidal volume to left lung. Intra operative vitals were stable throughout the procedure.

Anaesthesia was maintained with 50% nitrous oxide in oxygen, IV Propofol, IV Vecuronium along with volatile inhalational agent maintained with positive pressure ventilation. Further analgesia was supplemented by Inj.Paracetamol IV and Inj Diclofenac IV. The haemodynamic parameters remained stable throughout the procedure. The procedure lasted for 6hrs during which 4 crystalloids was given. The patient was extubated after adequate spontaneous efforts. After extubation the patient started desaturating, saturation <70% on room air, immediately the patient was reintubated and shifted to ICU with ET tube insitu. The patient was extubated in ICU after 2 days and shifted to postoperative ward.

Discussion

Double lumen tubes are the most commonly used tubes for lung isolation. They are designed to isolate, selectively ventilate and/or collapse either lung. In practice, a left sided DLT that is too small requires a large endobronchial cuff volume, which might increase malposition.[1]

There are two basic methods of verifying the position of a DLT: auscultation and bronchoscopy. Verifying DLT position purely by auscultation can frequently result in malposition. If the DLT position verified initially by bronchoscopy at the of intubation, the bronchoscopy should be repeated before the initiation of one-lung ventilation.[2]

The DLT needs to be replaced with a single-lumen ETT post-operatively before the patient is shifted to the ICU, if post-operative ventilation is contemplated. This decision involves weighing of risk-benefit ratio by the anaesthesiologist, as changing the tube with a loss of airway control,and regaining it with ETT can be very risky at times; particularly when surgery has lasted long and fluid resuscitation with large amounts could have caused oedema of upper airway. For such occasions, airway exchange catheters (AECs) should be considered, the longer ones especially design for DLTs should be optimal. The AECs serve a dual purpose, it would act as a guide to the airway and would permit jet ventilation through the central lumen thus preventing hypoxia during airway exchange.[3]

Our patient was stabilised with differential ventilation and during extubation required oxygen supplementation due to the diseased lung not able to contribute much and a little bit of residual sedation, later was able to maintain saturation and was extubated.

Conclusion

In patients with active lung infection a plan for Double lumen ET tube may help in avoiding the infection spreading to healthy lung, intubation period is crucial to avoid most common problems such as malposition, airway trauma and tension pneumothorax caused by high ventilating pressure or large tidal volumes in patients.

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Case Report

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Intraoperative Management of Atrial Fibrillation Secondary to Hypercalcemia in a Patient with Parathyroid Adenoma

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Abstract

Introduction: Atrial fibrillation is one of the most common arrhythmias occurring in 0.4-5% of adult population and usually are not associated with any cardiac disease. Atrial fibrillation may be seen preoperatively in patients posted for anesthesia.

Case Report: A 48 Vyshya male patient with swelling in the neck, palpitations since two years, hypercalcemia and chronic kidney disease with irregularly irregular pulse (88 per min), BP of 110/60 mmHg and respiratory rate of 20/min. Electrocardiogram showed atrial fibrillation. Echocardiography showed non obstructive hypertrophic cardiomyopathy with dilated left atrium and right atrium , moderate pulmonary artery hypertension with ejection fraction of 60%. Patient was diagnosed to have left parathyroid adenoma and was posted for parathyroidectomy. Serum parathyroid hormone levels was 756 pg/ml. Patient was on Inj. Enoxaparin 40 mg that was stopped twelve hours before day of surgery and Amiodarone 100mg and Metoprolol 25mg which was continued on day of surgery.

Continuous ECG, invasive arterial blood pressure, pulse oximetry, capnography, neuromuscular monitoring was done. After preoxygenation, induced with propofol and fentanyl.Intubation done with injection vecuronium. Anaesthesia was maintained with Isoflurane ,oxygen, nitrous oxide and vecuronium. Arterial line was established. Left inferior parathyroidectomy was done in 4 hours. Inj. Amiodarone 3mg/kg diluted in 100 ml normal saline was started before skin incision. Patient was in persistent atrial fibrillation throughout the surgery, extubation was done and the patient was sent to intensive care unit.

Conclusion: Patients with atrial fibrillation secondary to hypercalcemia undergoing a crucial non cardiac surgery needs thorough understanding of hemodynamic changes, vigilant intraoperative monitoring with proper preoperative and intraoperative cardiac medication.

Keywords: Atrial fibrillation; Hypercalcemia; Parathyroid adenoma.

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Introduction

Atrial fibrillation may be seen perioperatively in patients posted for anaesthesia. Atrial fibrillation is one of the most common arrhythmias occurring in 0.4-5% of adult population and usually are not associated with any cardiac disease. Atrial fibrillation with hemodynamic instability poses a problem during peri operative period. This should be corrected either with use of medications or cardioversion. If it is not reverted to sinus rhythm ,temporary pacing maybe necessary. Our case had persistent hypercalcemia due to parathyroid adenoma and chronic kidney disease which resulted in persistent atrial fibrillation with stable hemodynamics.

Case Report

Here we describe the anaesthetic management of a 48 Vyshya male patient who had swelling in the neck, palpitations since two years. Known case of hypercalcemia and chronic kidney disease. Physical examination revealed irregularly irregular pulse (88 per min), BP of 110/60 mmHg and respiratory rate of 20/min. Electrocardiogram showed atrial fibrillation. Echocardiography showed non obstructive hypertrophic cardiomyopathy with dilated left atrium and right atrium, moderate pulmonary artery hypertension with ejection fraction of 60%. Patient was diagnosed to have left parathyroid adenoma and was posted for parathyroidectomy.

Other systems examination were within normal limits. Airway examination revealed a Mallampatti Score of II. Serum parathyroid hormone levels was 756 pg/ml. Patient was on Inj.Enoxaparin 40 mg that was stopped twelve hours before day of surgery and Amiodarone 100mg and Metoprolol 25mg which was continued on day of surgery.

Anaesthetic Management

Femoral central venous catheterization was done. The patient was given metoclopramide and ranitidine. Continuous ECG, invasive arterial blood pressure, pulse oximetry, capnography, neuromuscular monitoring was done. After preoxygenation with 100% O2, induced with propofol and fentanyl. Intubation done by manual in line stabilisation and facilitated with injection vecuronium. Anaesthesia was maintained with Isoflurane ,oxygen, nitrous oxide and vecuronium. Arterial line was established. Anti arrhythmic drugs and external defibrillator were kept ready. Left inferior parathyroidectomy was done in 4 hours. Inj Amiodarone 3mg/kg diluted in 100ml normal saline was started before skin incision. Patient was in persistent atrial fibrillation throughout the surgery, extubation was done and the patient was sent to intensive care unit. Serum parathyroid hormone levels was 756 pg/ml prior to surgery, 1343 pg/ml on day of surgery, 59 pg/ml 30minutes after surgery and 84pg/ml 4 days after surgery.

Discussion

Atrial fibrillation is an arrhythmia seen commonly during the perioperative period in patients undergoing surgery. New onset atrial fibrillation is uncommon during the intraoperative period. The overall incidence of supraventricular tachycardia was found to be less than 1% and the incidence of AF and atrial flutter in SVT was 30% and 12%, out of which only 20% of arrhythmias occur intraoperatively.[1]

Management of AF mainly includes eliminating precipitating factors that can aggravate the condition of the patient and treatment of arrhythmia itself with pharmacological intervention. When patient is unstable, AF is treated by direct current cardioversion but pharmacological agents can also be used to obtain cardioversion. The ventricular rate in rapid and chronic AF can be controlled using pharmacological interventions. If precipitating factors are not removed or treated aggressively, arrhythmias may develop. Anticoagulation was given to reduce the risk of thromboembolism.

Diltiazem effectively controls ventricular rate but does not convert it into sinus rhythm. Better rate control has been found with digoxin compared to amiodarone but should be used cautiously because of associated hypotension. In persistent AF rate control is achieved using digoxin but it has no benefit in paroxysmal AF. Digoxin is to be supplemented with other drugs as it has slow onset for better ventricular rate control. So we decided to give Inj. Amiodarone intraoperatively to control rate and rhythm.[2]

There are no separate guidelines for anaesthesia in patients with primary hyperparathyroidism, but it has its own difficulties.[3]

Patients with primary hyperparathyroidism are usually asymptomatic. Clinical features in symptomatic patients include renal calculi, bone pains, pathological fractures, skeletal muscle weakness. Cardiac manifestations include prolonged PR interval, short QT interval and systemic hypertension. Primary hyperparathyroidism is demonstrated by persistent

hypercalcaemia in the presence of normal or elevated parathyroid hormone concentration.[4]

Intravenous fluids are the starting therapy for severe hypercalcaemia. Until euvolemia is reached, diuretic therapy should not be started. Loop diuretics decreases the proximal tubular reabsorption of calcium and rises the urinary calcium excretion by 200mEq/day. Thiazide diuretics should not be administered as it may increase renal tubular reabsorption of calcium. Forced dieresis is associated with cardiac decompensation, hypophosphataemia, hypokalaemia and hypomagnesaemia. Other treatment methods include calcitonin, bisphosphonates and dialysis, that are for the renal failure patients. In our case, normocalcaemia was attained with furosemide and hydration.[5] Malnutrition and low albumin levels are to be corrected in the preoperative period.

In intraoperative period, attention was on acid base status and transfusion of huge amounts of citrated blood. Continuous ECG monitoring in these patients is vital as hypercalcaemia can be associated with cardiac rhythm disturbances.[6] Accompanying skeletal muscle weakness can decrease the need of muscle relaxant. Hence neurological monitoring is mandatory by TOF monitoring and muscle relaxant given accordingly. As the patient was a vyshya ,skeletal muscle relaxant used after induction was vecuronium.

Alteration in the acid base status in the perioperative period can affect the serum calcium level and adds to the existing problem. Acidosis decreases calcium binding to albumin hence increasing the levels of ionized calcium, which can cause life threatening hypercalcaemia, and it is important to maintain normocarbia.

Our patient had no osteoporosis or pathological fractures after radiological examination. This is a point of concern while managing patients with hypercalcaemia. Positioning in the operating table hence needs particular care in such patients. Hence patient was intubated using manual inline stabilization technique .Another complication in these patients is recurrent laryngeal nerve injury. Therefore vocal cord movement needs to be assessed during extubation is needed.[1]

Postoperative hypoparathyroidism needs to be observed carefully to prevent a life threatening respiratory failure and associated ECG changes. Hence patient was shifted to ICU for postoperative monitoring. Serum calcium level returns to normal value by 3rd–4th day and needs to be monitored regularly postoperatively.[7]

Conclusion

Patients with atrial fibrillation secondary to hypercalcemia undergoing a crucial non cardiac surgery needs thorough understanding of hemodynamic changes, vigilant intraoperative monitoring with proper preoperative and intraoperative cardiac medication.

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Conflicts of interest: N/L

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Case Report

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A Case of Late Presenting Congenital Diaphragmatic Hernia: Anaesthetic Management

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Abstract

Late presenting Congenital Diaphragmatic hernia beyond the neonatal period though rare,,mostly misdiagnosed, mistreated and end up in life threatening complications. CDH can occur at any older age and usually present as mild respiratory symptoms to as severe as gastric obstruction or acute obstructive respiratory problems. Perhaps the error at reaching a definitive diagnosis is simply because of the fact, the possibility of CDH at an older age is totally neglected.

Keywords: Congenital Diaphragmatic Hernia; Acute respiratory distress.

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Introduction

Congenital Diaphragmatic Hernia refers to the defect in the diaphragm, through which the intra -abdominal organs extrude into the thoracic cavity.[1]

Though CDH usually presents in the first few hours of life with respiratory distress (from mild dysnoea to cyanosis) it is quite common to have late presentation at an older age. Majority of cases present with nonspecific respiratory and gastrointestinal (GI) symptoms in childhood or early adult life. The prognosis of late-presenting CDH is usually favourable than the CDH presenting in the neonatal period, only if properly diagnosed and surgically corrected.

Case Report

A 9 yr old boy weighing 19kg was brought to the emergency room of our hospital with progressive worsening of dysnoea over 2 days.

In the Emergency room, the boy was in severe respiratory distress with a respiratory rate of 58/ min and oxygen saturation of 72% in room air. Child was put on high flow O2 and his saturation improved to 90 - 92%. Systematic examination showed decreased to no air entry on left side, decreased air entry on right side in basal area with rhonchi and creps. Mediastinum was markedly shifted to right side with bowel sounds in thorax. Heart sounds were shifted to right. Past h/o similar symptoms were there since 5yrs and was treated

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as bronchial asthma and was on conservative management. Neonatal history was uneventful and didn't suggest any acute respiratory distress at birth.

A CXR taken at emergency room, showed bowel and stomach herniated to left side with subnormal lung expansion on left with air and fluid in left hemithorax, there was no liver herniation.(Figure 1).

Fig. 1

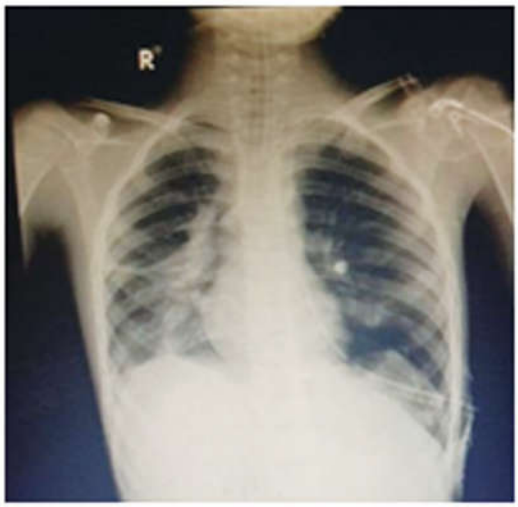

Fig. 2

A CT chest taken, showed Direct discontinuity of left hemidiaphragm with intrathoracic extension of abdominal contents diaphragmatic structure with hernia. Collapse consolidation of posterior segment of right upper lobe and superior segments bilateral lower lobes medial segments. And Provisional diagnosis of Left diaphragmatic hernia was made.

After getting written high risk informed consent, child was posted for emergency repair of diaphragmatic hernia. Preoperative investigations were nearlynormal and preop ABG showed: PH:7.381, PO2 :70, PCO2 :35.4, HCO3 :20.6, SO2 : 93.6.

On arrival to OT, child's vitals noted as-Heart rate:124/min, BP: 80/60 mmHg, SPO2: 92%, Respiratory rate:50/min. 100% oxygen was given via facemask, a nasogastric tube and a urinary catheter were placed.

Pre-op monitors ECG, NIBP and Pulse oximetry were attached. Child was premedicated with Inj. perinorm 4mg, Inj.gylcopyrrolate 0.2mg and Inj. Fentanyl 40mcg. A Modified Rapid sequence Induction was done with Inj Propofol 40mg IV, skeletal muscle relaxant, Inj Rocuronium 20mg was given and at 1 minute child was intubated with ETT of size 5.5 mm and fixed at 16 cm. Anaesthesia was maintained with Air: oxygen at 1:1 to maintain end tidal isoflurane between 0.8 to 1 MAC. Patient was ventilated in PCV mode with settings TV: 120ml, PEEP: 5, RR: 33/min, A/W pressure: 30.

After Initially attempts of laparoscopic reduction of abdominal organs, the diaphragmatic elements were found to be very thin and minimal, surgeon proceeded with open diaphragmatic hernia repair. Intraoperatively patient was stable with SPO2 at 93%, HR- 120/min, BP- 100/60, ETCO2 – 52. Diaphragmatic repair was closed and hypoplastic lung was released and ICD was placed on left side. Duration of surgery lasted for 4 hrs with an intraoperative blood loss of about 200ml and had urine output – 50ml. Intraoperative fluid Mx was done with DNS as per Holiday Segar formula.

There was no episodes of hypotension, hypoxia, and hypothermia in intraoperative and immediate postoperative period.

CXR was done in the immediate postoperative period showed improved air entry into left lung. (Fig 2).

On POD1, child developed fever, tachycardia and hypotension with subcutaneous emphysema extending to the neck region. Chest X ray shows features suggestive of pneumomediastinum and pneumothorax.

ABG was done

ABG s/o respiratory acidosis (Ph – 7.32, PCO2 – 51, PO2 – 76, HCO3 – 25). Urine output decreased. Child was managed with dopamine, I/V fluids, and antibiotic was changed to Meropenem. ICD was repositioned. Over the next few days, child improved and child was extubated on 5th postoperative day but was continued on high flow oxygen for two more days. ICD was removed and child got discharged on 14 th postoperative day.

Discussion

The CDH can be a challenging case as it needs a teamwork of pediatrician, surgeon as well as anaesthesiologist. Clinical manifestations of late presenting CDH are so diverse that gastrointestinal symptoms-vomiting, abdominal pain and respiratory symptoms-dyspnea, cough, cyanosis can present alone or in combination. Chest x-ray, which is performed routinely in patient with these symptoms can mimic pleural effusion, pneumonia, or pneumothorax, which can lead to misdiagnosis and serious iatrogenic complications like gastric perforation by chest tube thoracotomy. When chest X-ray images are not diagnostic, spiral CT and MRI should be done for accurate diagnosis and management. If surgical treatment would not be followed promptly after accurate diagnosis for late presenting CDH, various disastrous complications such as intestinal strangulation, necrosis of herniated organs, hypersplenism, cardiopulmonary dysfunction, and short bowel syndrome, gastric volvulus, and death can be inevitable. If timely diagnosed and correctly repaired, their outcomes are mostly excellent because they have little or no lung hypoplasia.

Patient with CDH should be considered as full stomach because of possible gastrointestinal obstruction, and, therefore, these patients required aspiration prophylaxis. Nasogastric tube should be inserted and aspirated before induction. Large gauge intravenous access is necessary to manage any hemodynamic instability.

Rapid sequence induction with cricoid pressure must be the induction of choice, but when difficult airway is anticipated, awake fiberoptic intubation is the gold standard technique. Any event which increases intraabdominal pressure especially during induction, intubation, and extubation is detrimental. Positive pressure ventilation with potential gastric insufflation and expansion of compressed lung may decrease venous return and cardiac output. For the same reason protective ventilation strategies that avoid further injury to damaged lung tissue must be executed.The CDH EURO Consortium advocates aiming for the limitation of peak inspiratory pressures to 25 cm H_2O with PEEP kept at 3–5 cm H_2O and allowing permissive hypercapnia. Nitrous oxide may also worsen mass effect should, therefore, be avoided.

Conclusion

Late presenting CDH can have a wide spectrum of clinical manifestation. As it can progress to life threatening conditions such as CDH with gastric volvulus. A high index of suspicion is vital for the timely diagnosis and management.

As survival improves, further studies are required to ensure that the patient have a high quality of life after discharge, which can only occur with regular follow ups by multi disciplinary team.

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Errantam

Article Titled: "Intrathecal Bupivacaine vs Bupivacaine and Clonidine in Paediatrics Age Group: A Comparative Evaluation"

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The original published version of this Article contained errors in the designation and Institution name of the first author mentioned. Now Designation and Institution name of the first author in article re-added as

Article Titled: "Intrathecal Bupivacaine vs Bupivacaine and Clonidine in Paediatrics Age Group: A Comparative Evaluation"

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Abstract Page

The second page should carry the full title of the manuscript and an abstract (of no more than 150 words for case reports, brief reports and 250 words for original articles). The abstract should be structured and state the Context (Background), Aims, Settings and Design, Methods and Materials, Statistical analysis used, Results and Conclusions. Below the abstract should provide 3 to 10 keywords.

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State the background of the study and purpose of the study and summarize the rationale for the study or observation.

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The methods section should include only information that was available at the time the plan or protocol for the study was written such as study approach, design, type of sample, sample size, sampling technique, setting of the study, description of data collection tools and methods; all information obtained during the conduct of the study belongs in the Results section.

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Include summary of key findings (primary outcome measures, secondary outcome measures, results as they relate to a prior hypothesis); Strengths and limitations of the study (study question, study design, data collection, analysis and interpretation); Interpretation and implications in the context of the totality of evidence (is there a systematic review to refer to, if not, could one be reasonably done here and now?, What this study adds to the available evidence, effects on patient care and health policy, possible mechanisms)? Controversies raised by this study; and Future research directions (for this particular research collaboration, underlying mechanisms, clinical research). Do not repeat in detail data or other material given in the Introduction or the Results section.

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List references in alphabetical order. Each listed reference should be cited in text (not in alphabetic order), and each text citation should be listed in the References section. Identify references in text, tables, and legends by Arabic numerals in square bracket (e.g. [10]). Please refer to ICMJE Guidelines (http://www.nlm.nih.gov/bsd/uniform_ requirements.html) for more examples.

Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540–7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347–55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone-iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3–9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792–801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O,

Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. pp 7–27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979–2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7–18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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