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Comparision of Hemodynamic Effect of Sevoflorane 1.5% and Desflurane 3% in Laproscopic Appendicectomy

Dushyant Chavda[1], Shaikh Abdul Nasir[2], Anjali Kankhara[3]

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Abstract

Aims and objective: To compare heamodynamic parameters, complication, recovery time and time of early extubation with sevoflurane and desflurane.

Materials and methods: This was prospective study conducted from January to December 2020 using sampling technique total 60 adult patient of American society of Anesthesiologist (ASA) Grade I, II, III. Age between 18–60 years of either male or female who were posted for Laproscopic appendicectomy under general anesthesia were selected for study after informed consent. All the patient were randomly allocated into one of two group using computer generated random number table. Group 'S' received induction with sevofluraneamd Group 'D' received induction with desflurane.

Result: Both group were not differ significantly in age, weight, sex, ASA grade. Heart rate was significantly higher in sevoflurane group than desflurane group after intubation. Systolic blood pressure was significantly higher in sevoflurane group. Sevoflurane group showed higher time in spontaneous respiration, verbal commands following, ET removal time.

Conclusion: Desflurane provides faster recovery from anesthesia and better hemdynemic stability intraoperative and post operative.

Keywords: Desflurane, Sevoflurane, Hemodynamic.

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INTRODUCTION

Sevoflurane, a volatile anesthetic agent, is a halogenated methyl propyl ether. It is non-irritant, non-inflammable and produces bronchodilatation. Due to low blood/gas partition coefficient, it has rapid induction. It can be used for inhalational inductionand[1,2] and develop dose-dependent cardiovascular and respiratory depression. Sevoflurane does not activate the sympathetic nervous system.[3] Desflurane is a

fluorinated methyl ethyl ether and has a pungent odour, irritable to the respiratory tract and non-inflammable. Low solubility of desflurane in blood and body tissues leads to rapid induction and recovery. It does not predispose to ventricular arrhythmias. Monitoring of hemodynamic characteristics includes electrocardiogram (ECG), oxygen saturation, non-invasive mean arterial pressure, heart rate (HR) and end tidal CO_2 ($EtCO_2$). Early recovery facilitated by rapid and short acting drugs for induction and maintenance of anesthesia and following day care surgery. Hence, this study was carried out with the objective to compare the hemodynamic parameters and recovery characteristics of desflurane with sevoflurane.

MATERIALS AND METHODS

Study Setting and Duration

This study was conducted in the Department of Anesthesiology within the premises of tertiary care hospital of Jamnagar.

Study Design and Study Population

This was a prospective study designed to compare the hemodynamic and recovery profile of patients administered with desflurane vis-à-vis sevoflurane for general anesthesia. Using convenient sampling technique, a total of 60 adult patients of the American Society of Anesthesiologists (ASA) physical status Grade I, II and III aged between 18 and 60 years, of either sex, who were scheduled for laproscopic appendicectomy under general anesthesia were selected for the study after informed consent. Patients who did not provide consent to be included in the study or patients with correlated cardiovascular, pulmonary, renal disease or history of hypersensitivity to halogenated anesthetic agents were excluded from the study. All the patients were randomly allocated into one of the two groups using computer generated random number table. Hence, each group contained a total of thirty patients.

Anesthesia Technique: Induction, Maintenance and Recovery

Pre-anesthetic check-up was performed the day before and on the day of surgery. Basic routine investigations such as hemoglobin, renal function tests, serum electrolytes, random blood sugar and chest X-ray posteroanterior view were done and recorded. In the operating room, all standard monitors such as non-invasive blood pressure (NIBP), pulse oximetry (SpO_2), ECG and capnography ($EtCO_2$) were attached and vital parameters of the patient recorded. All the patients in both groups were pre-medicated with injection ondansetron 80mcg/kg and injection glycopyrrolate 4 mcg/kg intravenous (IV). In both groups, after pre-oxygenation with 100% O_2 for 3 min, anesthesia was induced using injection propofol 2 mg/kg IV. This was followed by endotracheal intubation facilitated using injection succinylcholine 2 mg/kg IV.

Intubation was confirmed with $EtCO_2$ and injection atracurium 0.5 mg/kg IV was given after return of respiration analgesia given with Inj. paracetamol 15 mg/kg and Inj. Dexmedetomidine 0.5 mcg/kg In Group S, anesthesia was maintained using sevoflurane (1.5%), nitrous oxide (50%) and oxygen (50%) with intermittent injection of atracurium. In Group D, anesthesia was maintained with desflurane (3%), nitrous oxide (50%) and oxygen (50%) with injection of atracurium intermittently.

Administration of volatile anesthetic agents and oxygen was discontinued at the end of surgery after the onset of spontaneous respiration. Neuromuscular blockade was reversed with injection neostigmine 50 mcg/kg iv and injection glycopyrrolate 8 mcg/kg IV. Extubating of trachea was done when patients were adequately recovered from the effects of neuromuscular blockade with regular breathing pattern and were able to respond to verbal commands. Time of extubation and the times at which patients were able to state their name were recorded.

STATISTICAL ANALYSIS

Qualitative data will be expressed as percentages and proportions.

Quantitative data will be expressed as mean and standard deviation. The differences between two groups with respect to continuous variables will be analysed using unpaired t-test, while categorical variables will be analysed using Chi-square test. $P < 0.05$ will be considered statistically significant, while $P < 0.01$ will be considered statistically highly significant.

Ethical Consent

Before doing study ethical clearance was taken from the hospital ethics committee. Each patient was taken for study after informed consent.

RESULTS

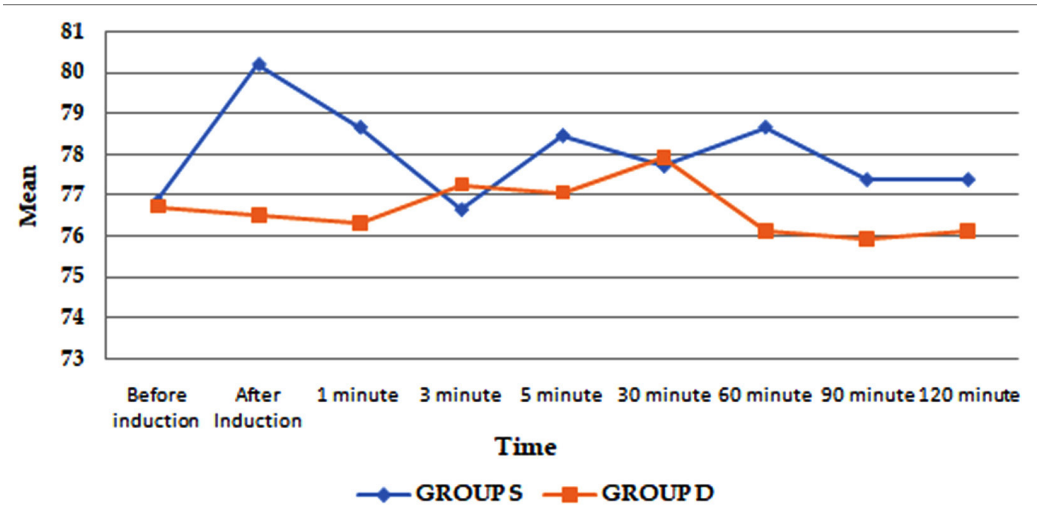
Total 60 patient aged 18 to 60 years with ASA I, II, III included in this study. Table 1 shows that baseline demographic analysis shows that two groups did not differ significantly in age, weight and sex. Both the group were comparable with respect to ASA grade and the difference was not significant.

Table 1: Baseline Characteristic of two Group.

Characteristic	Group S	Group D	P Value	Significance
Mean age ±SD	35.15 ±15.04	34.17± 5.75	>0.05	NS
Mean weight± SD	59.67± 6.3	59.17± 5.74	>0.05	NS
Male	16	18	>0.05	NS
Female	14	12	>0.05	NS
Grade I	5	4	>0.05	NS
GradeII	2	4	>0.05	NS
Grade III	23	22	>0.05	NS

Table 2: Mean Heart Rate (T Beats Per Minute) With Standard Deviation at Various Interval

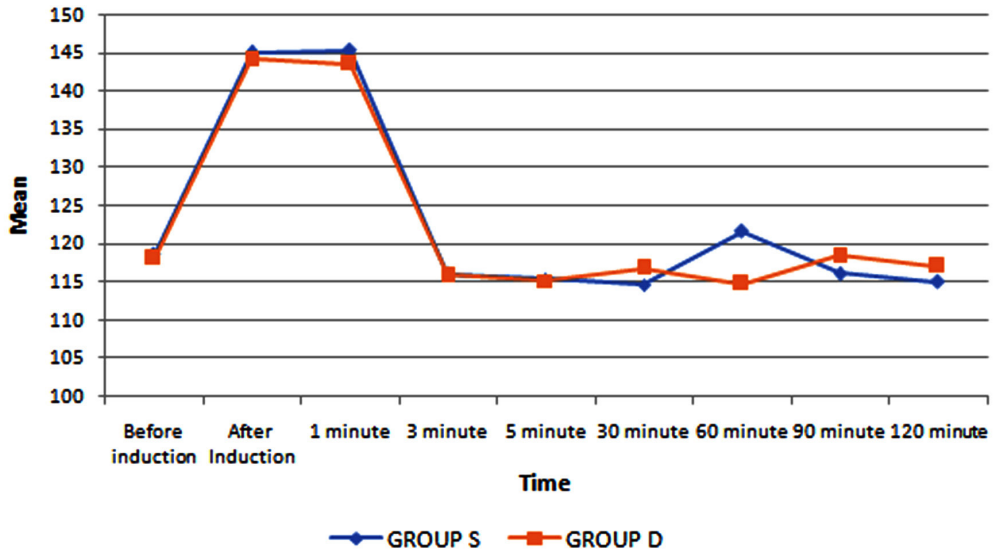
Time	Group S	Group D	P	Significance
Before induction	76.87 ±5.60	76.73±5.19	>0.05	NS
After Induction	80.20±4.88	76.53±5.70	<0.05	S
1 minute	78.67±5.39	76.33±5.20	>0.05	NS
3 minute	76.67±5.49	77.27±4.65	>0.05	NS
5 minute	78.47±5.60	77.07±3.92	>0.05	NS
30 minute	77.73±5.32	77.93±4.94	>0.05	NS
60 minute	78.67±4.28	76.13±2.78	>0.05	NS
90 minute	77.40±5.28	75.93±2.99	>0.05	NS
120 minute	77.40±5.28	76.13±2.73	>0.05	NS



In Table 2 Heart rate table shows that HR was statistically significantly higher in sevoflurane group than desflurane group at after intubation. There was no significant difference between before intubation and 1, 3, 5, 30, 60, 90, 120 minutes.

Table 3: Mean Systolic Blood Pressure at Various Intervals

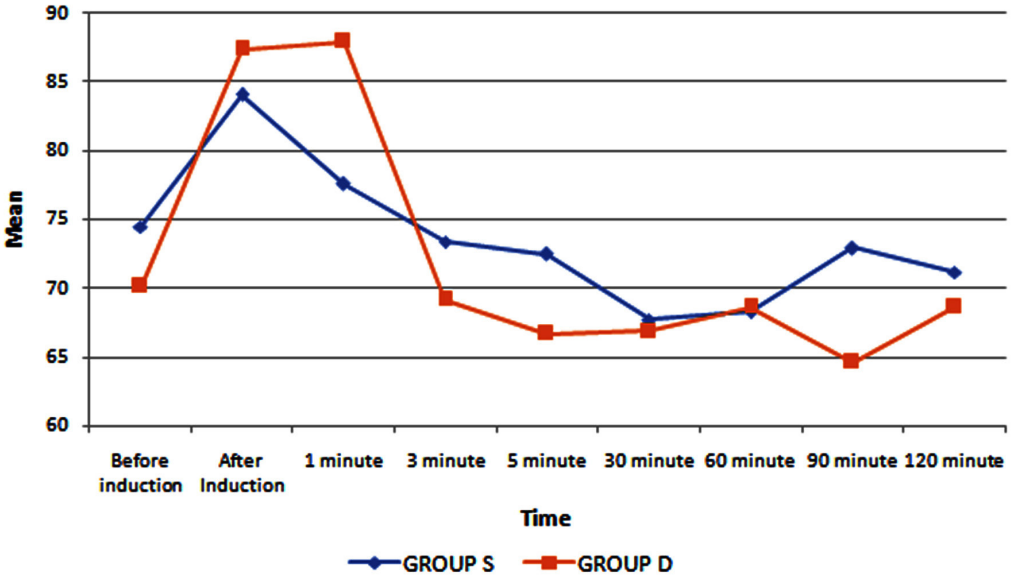
Time	Group S	Group D	P	Significance
Before induction	118.67±5.47	118.13±2.97	>0.05	NS
After induction	145.13±3.59	144.20±2.75	>0.05	NS
1 minute	145.33±3.73	143.67±3.37	>0.05	NS
3 minute	116.13±3.86	115.93±3.58	>0.05	NS
5 minute	115.47±4.17	115.20±3.18	>0.05	NS
30 minute	114.73±5.74	116.90±4.02	>0.05	NS
60 minute	121.67±4.49	114.80±2.66	<0.05	S
90 minute	116.20±2.59	118.47±4.32	<0.05	S
120 minute	115.07±3.81	117.13±3.85	<0.05	S



In table 3 Systolic blood pressure table shows systolic blood pressure was statistically significantly higher in Sevoflurane group than desflurane at 60,90,120 minute.

Table 4: Mean Diastolic Blood Pressure at Various Intervals

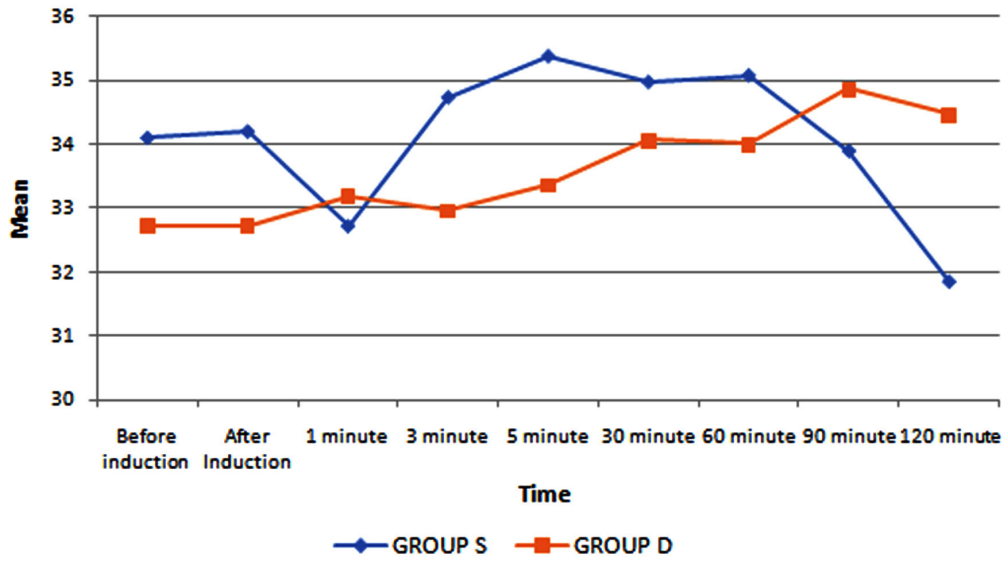
Time	Group S	Group D	P	Significance
Before induction	74.47±5.40	70.12±6.10	>0.05	NS
After induction	84.07±4.38	87.40±3.37	<0.05	S
1 min	77.60±5.44	87.93±3.73	<0.05	S
3 min	73.40±4.73	69.20±4.02	<0.05	S
5 min	72.47±4.69	66.67±3.03	<0.05	S
30 min	67.73±5.17	66.87±4.03	>0.05	NS
60 min	68.27±4.39	68.60±5.41	>0.05	NS
90 min	72.93±4.78	64.60±5.54	>0.05	NS
120 min	71.20±6.05	68.60±5.28	>0.05	NS



In table 4 Diastolic blood pressure table shows diastolic blood pressure of sevoflurane group has statistically Significantly higher at 3and 5 min after intubation than desflurane group.

Table 5: Mean End Tidal CO_2 Mmhg at Various Intervals

Time	Group S	Group D	P	Significance
Before induction	34.10±1.09	32.73±1.13	<0.05	S
After induction	34.20±1.19	32.73±1.14	<0.05	S
1 min	32.73±1.55	33.20±1.27	<0.05	S
3 min	34.73±1.08	32.97±1.00	<0.05	S
5 min	35.37±0.67	33.37±0.93	<0.05	S
30 min	34.97±0.71	34.07±1.53	>0.05	NS
60 min	35.07±0.83	34.00±1.31	<0.05	S
90 min	33.90±1.24	34.87±1.07	<0.05	S
120 min	31.87±1.01	34.47±1.04	<0.05	NS



In table 5 End tidal CO_2 table shows that $ETCO_2$ of sevoflurane group was statistically significantly Higher at before intubation, after intubation, 3, 5, 60 minutes.

Table 6: Recovery and Post Operative Complication in Both Groups

Profile	Group S	Group D	P value
Spontaneous respiration (min)	4.77± 0.97	3.47± 0.68	<0.05
Follow verbal commands (min)	6.10± 1.06	4.80 ± 0.75	<0.05
ET removal (min)	6.47 ± 0.51	6.20± 0.61	<0.05
Mucosal bleeding	9	5	-
Sore throat	20	25	-
Hoarseness of voice	5	10	-
Hypoxia	15	10	-
Change in pulse	14	6	-
Change in BP	10	3	-

Table 6 shows there was significantly delay in spontaneous respiration, verbal commands Following, ET removal time in sevoflurane group compared to desflurane group Post operative mucosal bleeding more in sevoflurane group. Post operative sore throat and hoarseness of voice more in desflurane group. Post operative hypoxia, change in blood pressure and heart rate more in Sevoflurane group.

DISCUSSON

Our study found there was no statistically significant difference between two group with respect to gender, age, body weight, ASA classification.

Time Taken for Spontaneous Breathing

In our study, time to spontaneous breathing from termination of anesthetic is significantly shorter with desflurane group when compared and sevoflurane groups ($p < 0.05$). In desflurane group it was 3.47±0.68 minutes whereas it was 5.23 ± 0.90 in sevoflurane groups respectively.

Time Taken for following Verbal Commands

Time for eye opening in desflurane and sevoflurane groups was 4.80±0.75 and 6.10±1.06 minutes respectively. It is significantly shorter in desflurane group ($p < 0.05$).

Time taken for Extubation

In our study the desflurane group took significantly shorter time for extubation when compared with the sevoflurane group. The time was 6.20+0.61 minutes in desflurane group and 7.27+0.83 minutes in sevoflurane group.($p<0.05$)

Gulcan Erk et al.[4] compared the effects of desflurane, sevoflurane and propofol on recovery characteristics and PONV in laparoscopic cholecystectomy. They found that extubation and eye opening times (early recovery) were meaningfully lower in desflurane group and no significant differences were observed in orientation, sitting and walking times (delayed recovery). In our study also the desflurane group had shorter early recovery times.

Dajun Song et al.[5] found that compared with the propofol group, the times to awakening and to achieve a recovery score of 10 were significantly shorter, and the percentage of patients judged fast-track eligible on arrival in the PACU was significantly higher, in the desflurane and sevoflurane groups (90% and 75% vs 26%) after laparoscopic tubal ligation surgery. They concluded that compared with propofol, desflurane and sevoflurane resulted in a higher percentage of outpatients being judged eligible for fast tracking.

Intraoperative Hemodynamics

The present study found observe that desflurane has better stability then sevoflurane regarding hemodynamic parameters such as heart rate, blood pressure, end tidal carbon dioxide.

The present study observed that desflurane has better stability than sevoflurane regarding hemodynamics parameter such as HR, BP, and $EtCO_2$. This finding are similar with similar study done by *Fletcher* et al.,[7] *Shan* et al.,[8] *Magni* et al.[9] and *Nathanson* et al.[10] However similar studies done by *White* et al.,[11] *Patel and Parmar*[12] *Gupta* et al.,[13] *Weiskopf* et al.[14] *Kang* et al.,[15] *Kaur* et al.,[16] *Strum* et al.[17] and *Gergin* et al.[6] observed ro difference between hemodynamic parameter such as HR,BP and $EtCO_2$.

Their result indicated that desflurane like isoflurane could maintain heamodynamic stability in concentration producing surgical anesthesia. In another study, finding showed that deflurane might be more successful in controlling hypertensive response than isoflurane.[21]

Post Operative Complications

In our study post operative sore throat and hoarseness of voice more with desflurane group, and mucosal bleeding, post operative hypoxia, post operative change in blood pressure, post operative change in heart rate changes more with sevoflurane group.

CONCLUSION

Our study concludes that desflurane provides faster recovery from anesthesia in patients undergoing laparoscopic appendectomy than sevoflurane. Our study also concludes that desflurane has better hemodynamic stability intraoperative and postoperative. Sore throat and hoarseness of voice more with desflurane.

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Conflicts of Interest: No conflicts of interest

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Clinical Evaluation of Plasma Cholinesterase with Clinical Symptomatology in Organophosphorus Poisoning

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Abstract

Objective: Level of plasma cholinesterase and its association with clinical manifestations.

Methods: This is a prospective study and observation study of 50 cases of organo phosphorus poisoning compound admitted in casualty and intensive care department. In present study we were evaluated plasma cholinesterase levels and correlate with clinical symptomatology in organo phosphorus poisoning, also included patient requiring ventilator support in respiratory failure patients. Prior approval for the study and the protocol was obtained from the institution ethical committee. In present study, serum cholinesterase estimation was repeated on after 6 hours, 12 hours, 24 hours, 48 hours, 96 hours and 7th day of stay in intensive care unit. The serum cholinesterase activity was measured by Genx cholinesterase butyryl thiocholine method (quantitative determination of cholinesterase in human serum).

Conclusion: In present study 50 cases of organophosphorus compound poisoning admitted to our tertiary care centre. Commonest age group 21 to 30 years and 31 to 40 years. Serum cholinesterase is a useful marker for predicting clinical outcome in op poisoning as marked reductions are associated with increased need for ventilator support, atropine requirement, duration of hospital stay and outcome. Serum cholinesterase levels correlated well with clinical manifestation, severity of poisoning, ventilator support required or not and outcome.

Keywords: Serum Cholinesterase; Organophosphorus Compound; Cholinesterase Butyryl Thiocholine.

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INTRODUCTION

Now a days, role of anesthesiologist varies apart from traditional indoor patient management for various operative procedures under various surgical fraternities to intensive and critical care management, pain relief, disaster management, etc. Anesthesiologists are mainly concerned with many medical emergencies, resuscitation in casualty, to support physician in intensive care unit, intensive

cardiac care unit, intensive respiratory care unit, intensive pediatrician care unit, etc. They are supposed to be master in this area. Among medical emergencies, organophosphorus compound poisoning is coming with increasing number of casualties in many developing counties.

More than 100 organophosphorus compounds are currently available for use as an insecticide. Organophosphorus compounds continue to be frequent reason for admission in hospital and ICU. World Health Organization has estimated that around 3 million people die every year due to various poisonings. It is estimated to be around 2.5 to 3.5 lakh deaths globally. Pesticide poisoning has become major health problem in developing country as millions of people are exposed to hazardous pesticides. On one side, these pesticides are used to increase yield in farming whereas on the other hand poverty (in developing countries like India) has led to face the dangerous side effects by self poisoning i.e. suicidal attempts leading to increase in casualties and mortality and thereby increasing strain on hospital services. The exact prevalence of organophosphorus compound poisoning in India is uncertain due to lack of data and proper reporting. In many reports in India, rate of suicidal poisoning ranges from 10.3 to 43.8%.[1]

Amongst these hospital mortality rate is as high as 20% to 70%.[2] Organophosphorus compounds causes accumulation of acetylcholine in synaptic gap via inhibition of acetyl cholinesterase enzyme and thereby decreasing degradation of acetylcholine. This leads to increase in cholinesterase activity and appearance of cholinergic symptoms, which mainly affects respiratory and other neuromuscular junctions. There is sustained depolarization, resulting in respiratory insufficiency due to paralysis of muscles of respiration.[3,4]

Pralidoxime is the main antidote of organophosphorus poisoning; dose needs to be adjusted as per time of consumption and severity of poisoning.[1] Main role of anesthesiologist in these circumstances is to start regular respiratory assistance either by assisted or mechanical ventilation. It is of prime importance to reduce the mortality and morbidity related to organophosphorus compounds.

This study was done to evaluate correlation of acetyl cholinesterase enzyme levels with type of poisoning, quantity of poisoning, duration of symptoms, duration of treatment and necessity of mechanical ventilation. All these factors were correlated with clinical profile, acetyl cholinesterase level, duration of mechanical ventilation, final outcome as mortality and morbidity in patient of organo phosphorus poisoning.

MATERIAL AND METHODS

This is a prospective study and observation study of 50 cases of organo phosphorus poisoning compound admitted in casualty and intensive care department. In present study we were evaluated plasma cholinesterase levels and correlate with clinical symptomatology in organo phosphorus poisoning, also included patient requiring ventilator support in respiratory failure patients. Prior approval for the study and the protocol was obtained from the institution ethical committee.

After explaining the possible prognosis in the course of organo phosphorus poisoning, consent from a responsible attendant, information of patient obtained before the actual study was initiated. In present study, we were taken inclusion criteria as history of exposure to organo phosphorus compound as indicated by patient or relative or referring doctor with characteristic sign and symptom of op compound. In present study we were taken exclusion criteria as food poisoning, sedative poisoning and chronic liver disease or pancreatic disease.

Provisional diagnosis of op compound poisoning was made on basis of definite history of poisoning given either by the patient or the patients attendant which was substantiated by examination of container or smell of clothes or typical clinical features such as excessive secretion, miosis, fasciculation, convulsion, or flaccid paralysis, or characteristic odour of stomach wash or vomitus.

Each patient enrolled in the study underwent a detailed examination with particular reference to vital sign, assessment of central nervous system, respiratory system and cardiovascular system. This examination was carried out at initial presentation in the emergency room and the cases were followed up during their ward and intensive care unit department. Collect 5ml serum sample using standard sampling tube on admission and serial interval in mentioned in our study, for estimation of plasma cholinesterase levels.

In present study, serum cholinesterase estimation was repeated on after 6 hours, 12 hours, 24 hours, 48 hours, 96 hours and 7th day of stay in intensive care unit. The serum cholinesterase activity was measured by Genx cholinesterase butyryl thiocholine method (quantitative determination of cholinesterase in human serum) proton best in class company kit. Reference range for serum cholinesterase in the lab was 4500 - 11500 U/L. Gene Cholinesterase Butyryl Thiocholine Method, Principle behind is cholinesterase catalyses the hydrolysis butyrylcholine, forming butyrate and thiocholine, thiocholine reduces yellow potassium hexacyanofer rate to colourless potassium hexacyanofer rate. The decrease of absorbance at 405 nm is proportional to the activity of CHE in sample.

Butyrylthiocholine + H_2O <cholinesterase> thiocholine + butyrate

2Thiocholine+2[Fe(CN)^6]3+2OH→Choline +H_2O+2 [Fe(CN)^6]4

Reference Value

Children: 4500—11500U/L

Males upto and Above 40 Years: 4000—11500U/L

Females upto and Above 40 Years: 3830—10800 U/L

During their follow up in ward and intensive care unit, each patient was closely monitored and ventilator support was considered in patient with respiratory failure. Biochemical value Inassessing the severity of op compound predicted in terms of need mechanical ventilation therapy.

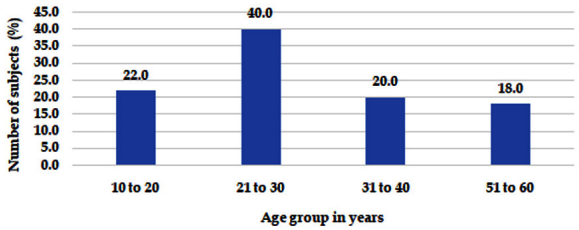
RESULTS

In present study 50 patients coming with consumption of OP poisoning in the casualty of tertiary care centre where assess and treated according this patients where in the various age group as shown in Table.

Table 1: Age wise distribution of patient

-		Frequency	Percent
Age group in years	10 to 20	11	22.0
	21 to 30	20	40.0
	31 to 40	10	20.0
	51 to 60	9	18.0
	Total	50	100.0

Graph 1: Age wise distribution of patient



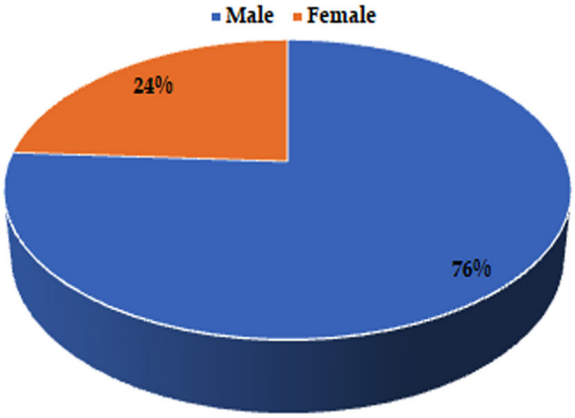
There were 11 patients in age group 10 to 20 years, 20 patients group in 21 to 30 age group, 10 patients in 31 to 40 age group and 9 patients in age group 50 to 60 and above were noted.

There were maximum number of patients 60% age group range 21 to 30 and 31 to 40 years age.

Table 2: Sex wise distribution of patients

-		Frequency	Percent
Sex	Male	38	76.0
	Female	12	24.0
	Total	50	100.0

Graph 2: Sex wise distribution of patients



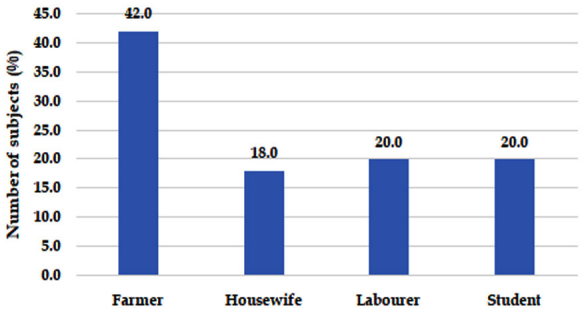
From above table, it was noted that there were 38 (76%) male patients and 12 (24%) female patients, these, there was male preponderance noted as far as consumption of OP compound is consider.

These 50 patients were further evaluated for occupation and it was noted as shown in Table.

Table 3: Occupation wise distribution of patients

-		Frequency	Percent
Occupation	Farmer	21	42.0
	Housewife	9	18.0
	Labourer	10	20.0
	Student	10	20.0
	Total	50	100.0

Graph 3: Occupation wise distribution of patients



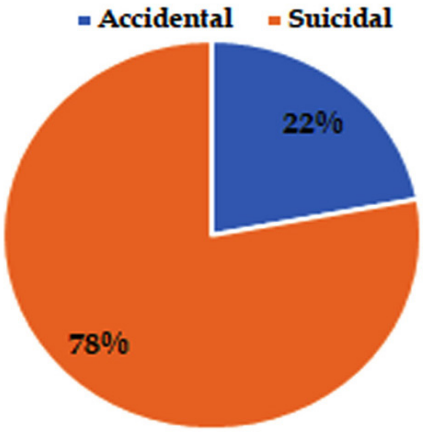
There were 21 (42%) patients were farmer by occupation, Female patients 9 (18%) were housewife, 10 (20%) patients were labourer and 10 (20%) patients were students. Consumption of OP compound noted, maximum patients occupation was Farmer.

These patients evaluated for the accepted cause of consumption as shown in table.

Table 4: Distribution of patients according to mode of consumption

-		Frequency	Percent
Suicidal/	Accidental	11	22.0
Accidental/	Suicidal	39	78.0
Homicidal	Total	50	100.0

Graph 4: Distribution of patients according to mode of consumption.



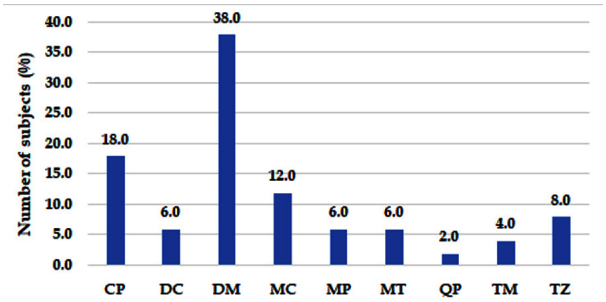
It was noted that maximum numbers of patients consumed OP compounds for suicidal purpose 39 (78%) and accidental consumption in 11 (22%) patients.

Distribution of OP compound consumed by these patients was shown in table.

Table 5: Distribution of OP compound consumed

	-	Frequency	Percent
Compound	CP (Chlorpyrifos)	9	18.0
	DC (Dichlorofos)	3	6.0
	DM (Dimethoate)	19	38.0
	MC (Monochrotophos)	6	12.0
	MP (Methyl parathione)	3	6.0
	MT (Malathion)	3	6.0
	QP (Quinolphos)	1	2.0
	TM (Thiamate)	2	4.0
	TZ (Trizofos)	4	8.0
	Total	50	100.0

Graph 5: Distribution of OP compound consumed



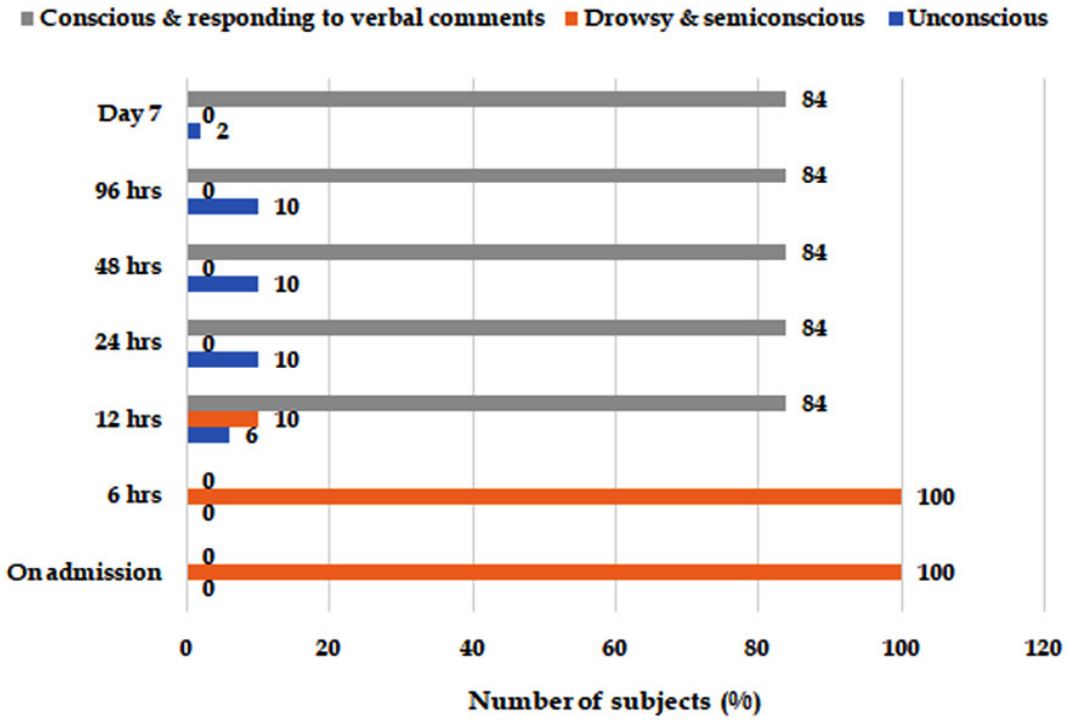
It was noted that maximum number of patients that is 19 (38%) consumed DM (Dimethoate) followed by CP (Chlorpyrifos) 9 (18%) Patients.

In the casualty these patients were examined for status of consciousness, It was noted as unconscious, semiconscious, drowsy, conscious and responding to verbal commands. The condition of patients were shown in table.

Table 6: Distribution of status of patient

	-	Unconscious		Drowsy & semiconscious		Conscious & Responding to verbal comments	
Status	On admission	–	–	50	100	–	–
	6 hrs	–	–	50	100	–	–
	12 hrs	3	6	5	10	42	84
	24 hrs	5	10	–	–	42	84
	48 hrs	5	10	–	–	42	84
	96 hrs	5	10	–	–	42	84
	Day 7	1	2	–	–	42	84

Graph 6: Distribution of status of patient



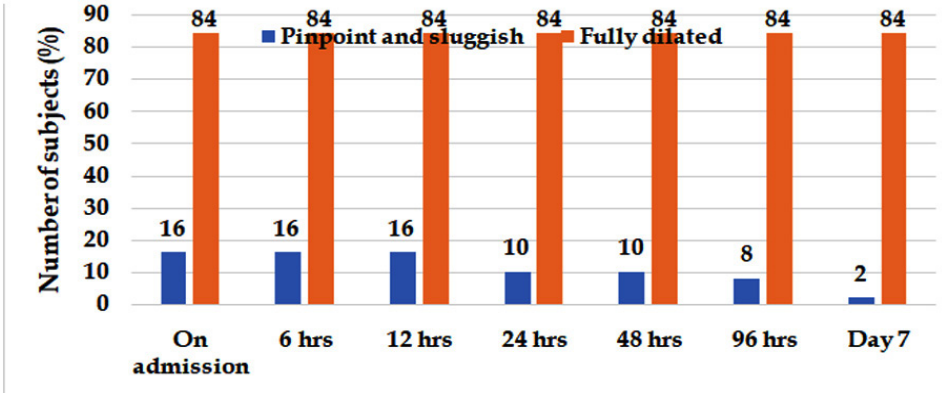
Graph 6: The status was evaluated immediately on admission then after 6 hours, 12 hours, 24 hours, 48 hours, 96 hours and 7 day. Status at various interval shown in table no. 5. It was noted that most of patients were semi-conscious and drowsy. It was also noted that up to 6 hour these patients semi-conscious, at 12 hour 3 patient (6%) were unconscious, 5 patients (10%) semi-conscious and 42 patients (80%) conscious and responding to verbal commands. 24 to 96 hours out-off these patients, 5 patients (10%) develop unconscious. Rest of the patients were conscious and responding to verbal commands at 24 hour and further time interval.

Organophosphorus compound has it direct effect on the size of pupil stating gravity and outcome of these patients, size of pupil evaluated as pin-point, sluggishly reacting to light or fully dilated, reacting to light. The pupil response of the patient for the treatment as either atropinisation or PAM was corresponding to the size of pupil and reacting to light. Size of pupil on admission and at various time interval as 6 hour, 24 hour, 48 hour, 96 hour, 7 days was noted as shown in the table.

Table 7: Distrubution of pupil status at various time interval

-		Pinpoint and sluggish		Fully dilated	
Pupils status	On admission	8	16.0	42	84.0
	6 hrs	8	16.0	42	84.0
	12 hrs	8	16.0	42	84.0
	24 hrs	5	10.0	42	84.0
	48 hrs	5	10.0	42	84.0
	96 hrs	4	8.0	42	84.0
	Day 7	1	2.0	42	84.0

Graph 7: Distrubution of pupil status at various time interval



It was noted that on admission and various time interval 42 (84%) patients pupil were semi-dilated, dilated reacting to light indicating severity of consumption of op compound in a patient were pupil pin-point and sluggishly reacting to light up to 12 hours, in 5 patients 24 hour, 48 hour, 4 patients in 96 hours, the pupil pin-point sluggishly reacting to light indicating severity and effects of op compound on various system.

Table 8: Distribution of patients according to convulsion at various time interval.

	-	Absent		Present	
Convulsions	On admission	42	84.0	8	16.0
	6 hrs	–	–	50	100.0
	12 hrs	–	–	50	100.0
	24 hrs	–	–	50	100.0
	48 hrs	–	–	50	100.0
	96 hrs	–	–	50	100.0
	Day 7	–	–	50	100.0

In OP compound poisoning many times patient come with convulsion as symptoms, presence of convulsion on admission as well as at various time interval as shown in above table.

In 42 patients (84%) there were no convulsion as first presenting complaint on admission. On 8 patient (16%) had convulsion indicating severity of OP compound consumption as well as quantity of drug and delay in the time to attend medical treatment at 6 hour then after these convulsion subside in most of patients.

Graph 8: Distribution of patients according to convulsion at various time interval.

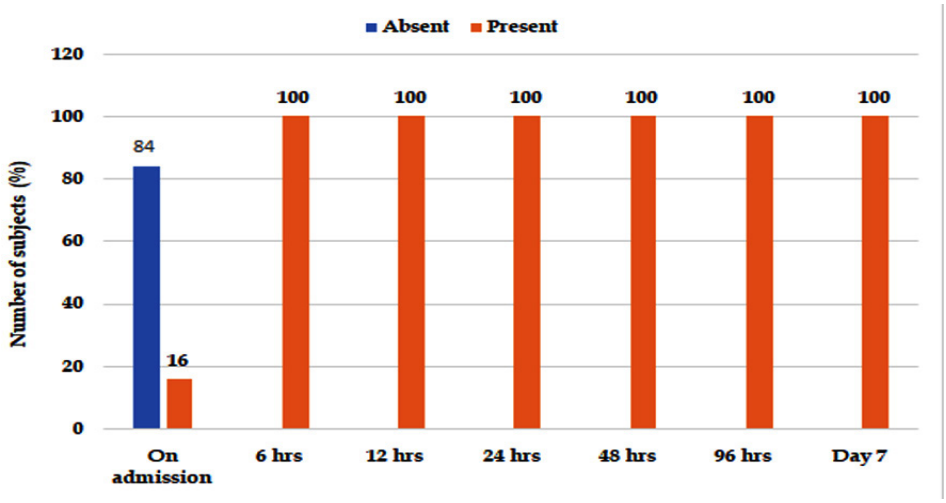
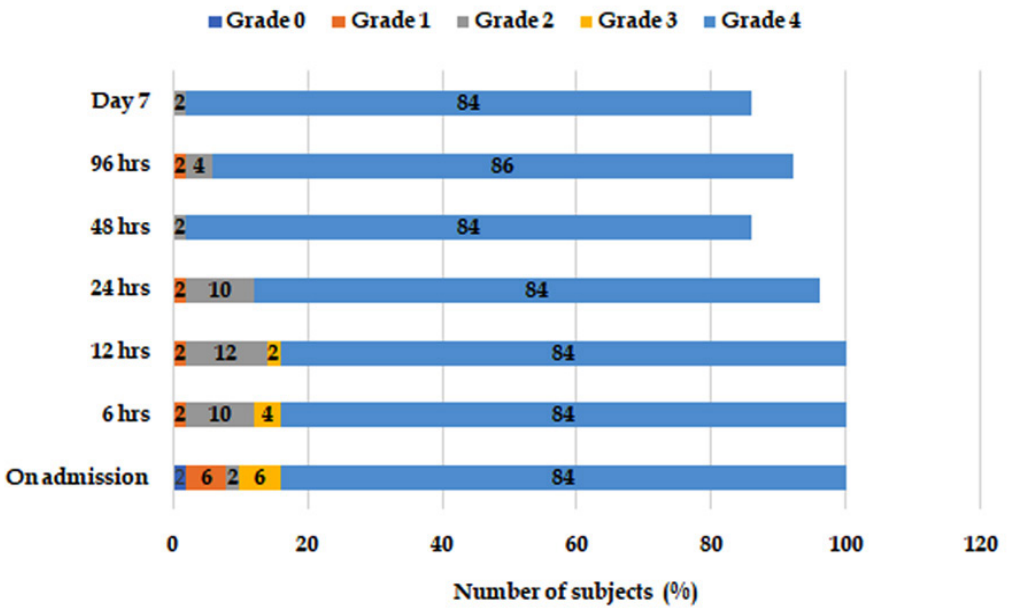


Table 9: Distribution of patients according to motor power at various time interval.

Motor power	On admission		6 hrs		12 hrs		24 hrs		48 hrs		96 hrs		Day 7	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
–	1	2.0	–	–	–	–	–	–	–	–	–	–	–	–
1	3	6.0	1	2.0	1	2.0	1	2.0	–	–	1	2.0	–	0
2	1	2.0	5	10.0	6	12.0	5	10.0	1	2.0	2	4.0	1	2.0
3	3	6.0	2	4.0	1	2.0	–	–	–	–	–	–	–	–
4	42	84.0	42	84.0	42	84.0	42	84.0	42	84.0	43	86.0	42	84.0

Graph 9: Distribution of patients according to motor power at various time interval



OP compound directly affects motor system, acting at neuro-muscular junction, these direct effects on motor power, according to Bromage scale motor power asses as grade 0-complete paralysis, 1-as flicker movement, 2-active movement with eliminating gravity, 3-active movement against gravity, 4-active movement against resistance, 5-normal muscle power. These 50 patients were assessed for motor power on admission as well as 6 hours, 12 hours, 24 hours, 48 hours, 96 hours, day 7. On admission only one patient (2%) had complete paralysis with power 0, grade 1 power was noted 3(6%) patients on admission and 1 patient (2%) on admission, 5 patients (10%) at 6 hours, 6 patients (12%) at 12 hours, 5 patients (10%) at 24 hours, 1 patient (2%) at 48 hours, 96 hours, day 7.

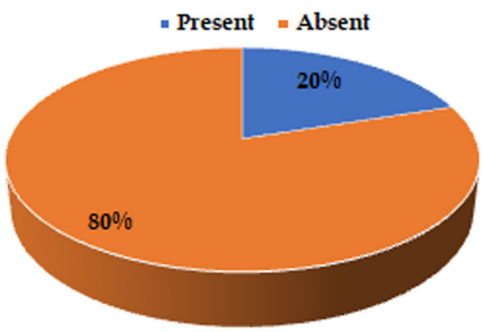
Grade 3 power noted in 3 patients (6%) on admission, 2(4%) patients at 6 hours and 1(2%) patient at 12 hours. Grade 4 motor power that is no effect on motor system was noted 42(84%) patient on admission as well as subsequent time interval.

Again all these patient were assed for presence of respiratory inadequecy requiring respiratory assistance for ventilator support it was shown in table no. 10.

Table 10: Distribution of patients according to Respiratory failure

-		Frequency	Percent
Respiratory Failure	Present	10	20.0
	Absent	40	80.0
	Total	50	100.0

Graph 10: Distribution of patients according to Respiratory failure



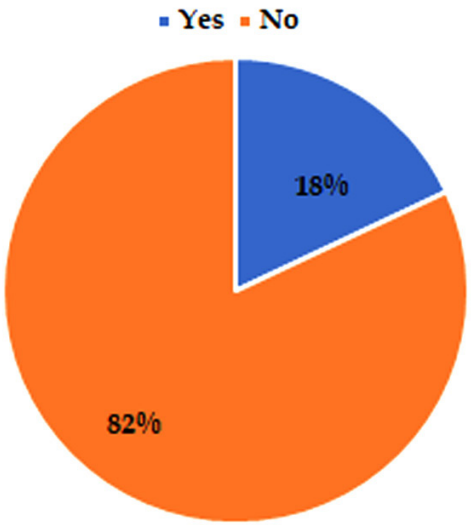
In 40 (80%) patients, respiration of patient adequate or not required respiratory support. In 10 (20%) patient due to gravity of OP compound poisoning there was, respiratory inadequacy and these patients required, respiratory assistance in term of either oxygen supplementation, end tracheal intubation, mechanical ventilation.

Ventilatory support, mechanical ventilation was required 9 (18%) patients, the net result as survival or mortality was noted as shown in table.

Table 11: Distribution of patients according to Ventilatory support.

-		Frequency	Percent
Ventilatory support	Yes	9	18.0
	No	41	82.0
	Total	50	100.0

Graph 11: Distribution of patients according to Ventilatory support



Out of these 50 patients 41(82%) not required ventilatory support and 9(18%) patients required ventilatory support.

Table 12: Distribution of patients according to outcome

-		Frequency	Percent
Outcome	Survived	42	84.0
	Death	8	16.0
	Total	50	100.0

Above table shows that out of 50 patients, 42(84%) of patients responding well to treatment and discharged from hospital. 8(16%) patients succumb to death in spite of intensive care management.

Graph 12: Distribution of patients according to outcome

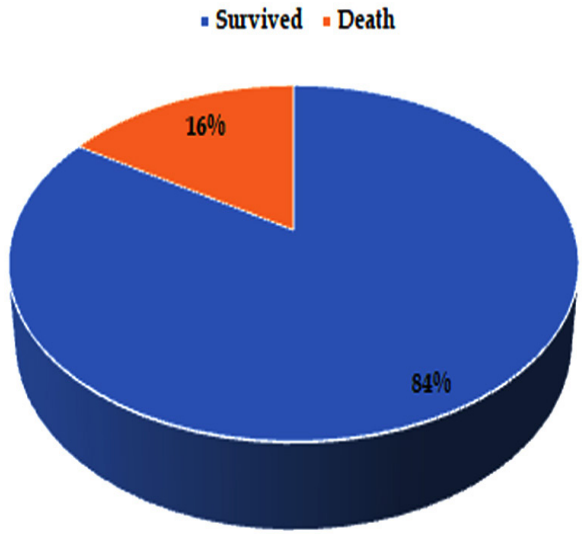


Table 13: Association between mean Serum Cholinesterase and outcome at various time intervals

Outcome		N	Mean	Std. Deviation	t	p	Inference
SC On Admission	Survived	42	2805.57	1331.14	4.712	0.00001	Highly significant
	Death	8	565.00	198.94		(<0.001)	
SC 6 hrs	Survived	42	2647.33	755.01	4.720	0.00001	Highly significant
	Death	8	1331.88	489.62		(<0.001)	
SC 12 hrs	Survived	42	3099.00	881.19	3.575	0.0001	Highly significant
	Death	8	1956.88	395.27		(<0.001)	
SC 24 hrs	Survived	42	3938.19	734.06	4.037	0.00001	Highly significant
	Death	5	2570.40	497.13		(<0.001)	
SC 48 hrs	Survived	42	4503.60	859.03	4.564	0.00001	Highly significant
	Death	5	2658.80	806.23		(<0.001)	
SC 96 hrs	Survived	42	4950.12	969.31	6.003	0.00001	Highly significant
	Death	4	2001.75	283.76		(<0.001)	
SC 7 days	Survived	42	5780.29	1436.77	2.738	0.00900	Highly significant
	Death	1	1800.00	–		(<0.001)	

These entire patient's serum cholinesterase enzyme was estimated on admission and 6 hours, hours, 24 hours, 48 hours, 96 hours and day 7. In 42(84%) patient mean SC value was 2805.57 ± 1331.14 significantly higher as compare to SC level in patient mortality, 8(16%) patients (mean-565.0±198.94) at 6 hour the patient survived the mean SC level was 2647.33±755.01, 12 hour it was 3099.0±881.19, at 24 hour it was 3938.19±734.06, at 48 hour it was 4503.60±859.03, at 96 hours it was 4950.12±969.31, at day 7 it was survived patient was 5780.29±1436.77.

These value were significantly higher at all time intervals when SC level were compare to value in patient who succumb to death. Again it was noted that SC value go on increasing as Various time interval as compare to value as admission.

Graph 13: Association between mean Serum Cholinesterase and outcome at various time interval

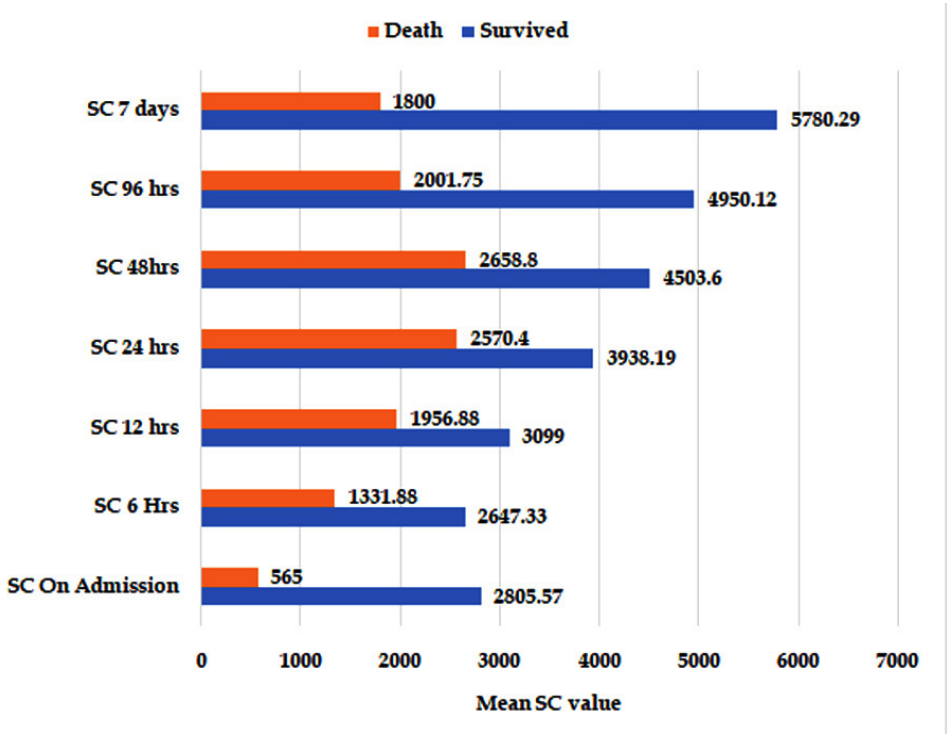


Table 14: Association between mean SC and ventilatory support at various time interval

Ventilatory support		N	Mean	Std. Deviation	t	p	Inference
SC On Admission	Yes	9	1041.67	1056.50	-3.499	0.001	Highly significant
	No	41	2755.59	1378.89		(<0.01)	
SC 6 Hrs	Yes	9	1693.44	915.57	-3.084	0.003	Highly significant
	No	41	2600.05	773.08		(<0.01)	
SC 12 hrs	Yes	9	2288.67	791.55	-2.356	0.023	Significant
	No	41	3054.02	899.45		(<0.05)	
SC 24 hrs	Yes	7	2932.86	756.82	-3.285	0.002	Highly significant
	No	40	3943.15	749.75		(<0.01)	
SC 48hrs	Yes	7	3296.71	1279.88	-3.087	0.003	Highly significant
	No	40	4484.20	874.60		(<0.01)	
SC 96 hrs	Yes	6	3197.50	1869.27	-3.513	0.001	Highly significant
	No	40	4918.18	981.80		(<0.01)	
SC 7 days	Yes	3	4848.33	2684.57	-0.976	0.335	Highly significant
	No	40	5750.68	1462.56		(>0.05)	

Ventilator support in term of mechanical assisted ventilation was co related with SC levels at various time intervals, it was noted ventilator support was required mostly in patient with low level of SC. Ventilator support was not necessary with in patient of normal or higher SC value.

Graph 14: Association between mean SC and ventilatory support at various time interval.

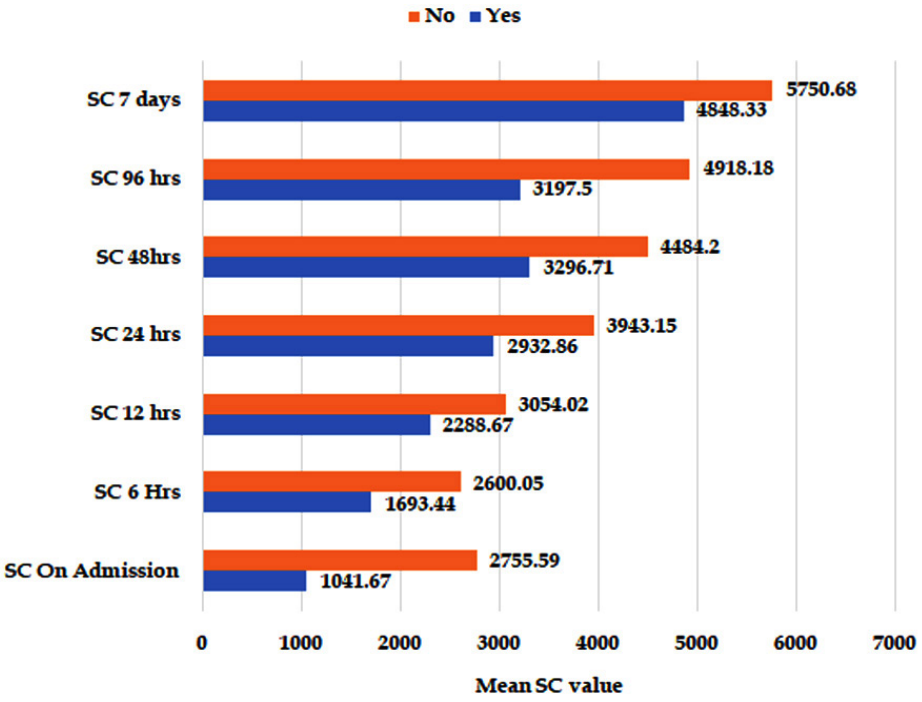


Table 15: Association between Age and outcome

Age group in years	Survived		Death		Total
	Frequency	Percent	Frequency	Percent	
10 to 20	10	23.8	1	12.5	11
21 to 30	17	40.5	3	37.5	20
31 to 40	7	16.7	3	37.5	10
51 to 60	8	19.0	1	12.5	9
Total	42	100.0	8	100.0	50

Chi square test-2.02, p-0.56 (>0.05), Not significant

Graph 15: Association between Age and outcome

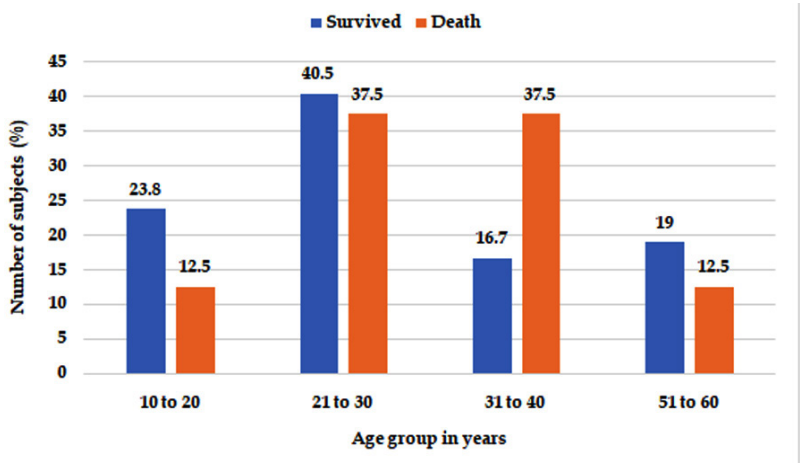
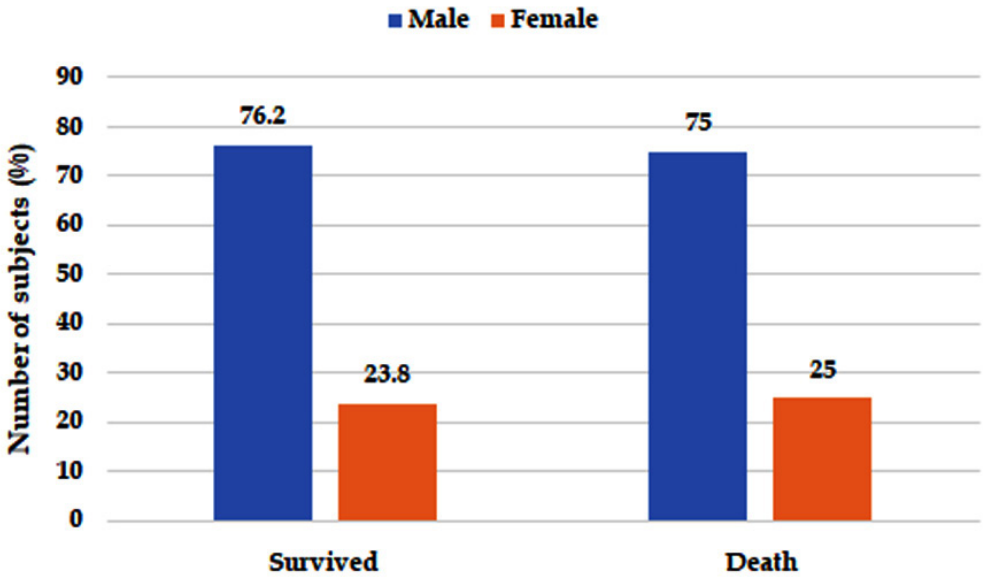


Table 16: Association between Gender and outcome

Gender	Survived		Death		Total
	Frequency	Percent	Frequency	Percent	
Male	32	76.2	6	75.0	38
Female	10	23.8	2	25.0	12
Total	42	100.0	8	100.0	50

Chi square test-0.005, p-0.94 (>0.05), Not significant

Graph 16: Association between Gender and outcome



Descriptive statistics of the variables

Table 17: Discriptive statistics of the variables

-	N	Mean	Std. Deviation	Std. Error	Range	Minimum	Maximum
Age	50	31.04	13.26	1.88	46	14	60
Approximate Quantity in ml	50	27.30	11.88	1.68	50	10	60
SC On Admission	50	2447.08	1475.39	208.65	8735	325	9060
SC 6 Hrs	50	2436.86	865.18	122.36	4088	780	4868
SC 12 hrs	50	2916.26	922.46	130.46	4168	960	5128
SC 24 hrs	47	3792.68	826.73	120.59	3564	1920	5484
SC 48 hrs	47	4307.34	1022.16	149.10	5004	1430	6434
SC 96 hrs	46	4693.74	1251.77	184.56	4675	1775	6450
SC 7 days	43	5687.72	1543.89	235.44	6977	1800	8777
PR On Admission	50	73.44	17.24	2.44	58	50	108
PR 6 hrs	50	110.68	10.26	1.45	50	94	144
PR 12 hrs	50	105.28	16.23	2.30	84	40	124
PR 24 hrs	48	105.83	15.44	2.23	94	50	144
PR 48 hrs	47	103.57	19.30	2.82	88	40	128
PR 96 hrs	45	105.87	18.54	2.76	96	48	144
PR 7 days	43	107.95	12.03	1.83	72	52	124
SBP On Admission	50	110.80	14.21	2.01	70	80	150
SBP 6 Hrs	50	111.88	9.78	1.38	50	100	150

SBP 12 hrs	50	112.08	11.05	1.56	62	88	150
SBP 24 hrs	48	110.02	17.65	2.55	132	18	150
SBP 48 hrs	47	111.36	10.45	1.52	60	90	150
SBP 96 hrs	45	112.49	11.55	1.72	70	80	150
SBP 7 days	43	113.35	10.83	1.65	50	100	150
RR on Admission	50	31.48	4.48	0.63	20	22	42
RR 6 hrs	50	31.48	4.48	0.63	20	22	42
RR 12 hrs	50	31.64	4.49	0.64	20	22	42
RR 24 hrs	48	31.50	4.40	0.63	20	22	42
RR 48 hrs	47	33.28	4.42	0.64	18	24	42
RR 96 hrs	45	31.73	4.82	0.72	18	24	42
RR 7 days	43	31.53	4.47	0.68	18	24	42

Anesthesiology is consider as secondary importance's branch in medical fraternity, while reviewing importance's of anesthesiologist. They came across various medical emergency and that to their role remains vital importance's. In the casualty department of various medical institute. There might be various patient with various medical emergency, tertiary medical institute in their casualty department patient with medical emergency requiring institutional intensive care unit services with availability of various experts. Many times accidental medical emergency commonly come across in the surgical fraternity but medical emergency are also very common.

In medical emergency like acute myocardial infarction, acute respiratory distress, end stage liver disease or many common with some incidence of acute poisoning. In acute poisoning severe gastritis, gastroenteritis, colitis are come across with mass casualty of food poisoning. Organo phosphorous poisoning is one more important medical emergency coming across in country, mainly district level hospital and may be from their referred to medical institute. Organo phosphorous compound are used worldwide in agriculture as well as in household gardens.[2] Their is easy availability of these compound resulting in gradual increasing in accidental, suicidal poisoning, mainly developing country. Organo phosphorus poisoning may result as accidental, suicidal or homicidal.

World health organization had estimated around 3 million people died every year due to various poisoning but actual incidence of organo phosphorous poisoning is difficult to find out. It is estimated to around 2 lakh to 3.5 lakh deaths per year around world.[1]

In India agriculture industry, these compound abundantly used, many times these compound easily available over the country in cheaper prices and indiscriminate used hence handling and storage had increased the number of poisoning cases. The incidence of organo phosphorous poisoning in India is highest among the world. Recent data from national crime bureaus showed that suicide by consumption pesticide is approximate 90% in all cases of poisoning related deaths in India. The rate of suicide poisoning with organo phosphorous compound ranges from 10% to 43% in young adult female farmer and from low socio-economic strata.[1]

Anesthesiologist consider to be leaders in the intensive care management with their expertise in the field of resuscitation, basic life support and managing capability in the field of ventilator therapy, play vital role, hence anesthesiologist are mainly called for management of acute poisoning particularly organo phosphorous poisoning compound, after consumption of organo phosphorous compound act by inhibiting cholinesterase activity, estimation of acetyl cholinesterase level is done to asses severity of organo phosphorous compound poisoning, considering availability limited resources. It is important that treatment priority should be made depending on severity of poisoning as well as availability of intensive care unit beds and manpower, so it pertinent that severity of poisoning needs to certain, base on clinical and laboratory assessment, as coated organo phosphorous compounds act by inhibiting both cholinesterase and pseudo cholinesterase activity irreversibility and fact that these leads to accumulation of acetylcholine at synapse causing over stimulation of acetylcholine receptor with distributions of neurotransmission in the central and peripheral nervous system, so it is range to estimate, acetylcholine level to assess severity of organo phosphorous poisoning.

Syed M. Ahmed 2014 et al.[2], *V Agrawal* 2018 et al.[1], *G.V Rao* 2016 et al.[39], *D.V Murthy* 2013 et al.[35], *Murat Sungur, Muhammed Guven* 2001 et al.[30], *Michael*

Eddleston, Surjith Singh 2006 et al.[33], *John victor peter, Thomas Isaiah sugarcane* 2014 et al.[37], *M. Eddleston, Andrew Dawson* 2004 et al.[32], *Fazle Rabbi chowdhary* 2015 et al.[38], *James O. J. Davis* 2008 et al.[34], *T Yardan* 2016 et al.[41], *V. Honnakatti* 2018 et al.[44], *V. A. Kothiwale* 2020 et al.[45], *Sudisha Mukherjee* 2020 et al.[46] all have work on clinical profile of organo phosphorous poisoning with role of anesthesiologist for ventilator support in correlation with cholinesterase levels.

The Present randomize prospective study was also plan emphasize the role of anesthesiologist in patient requiring ventilator support and its correlation with acetylcholine level at various time interval in the orango phosphorous compound poisoning. In the present study, age wise distribution of patients with organo phosphorous compound poisoning when consider, it was noted that consumption of organo phosphorous compound is most common between Age group 21 to 30 years followed 31 to 40 years. It is less common in below 20 year and geriatric patient, male preponderance was 76% and female 24%, 21 to 40 year age range most commonly are male workers in agriculture industry and in some other places. In India, male workers usually workers in agriculture due to their ability and working fields, that is also age ranges where total responsibility of financial working strategy in India.

The incidance of poisoning is comparatively asses in the geriatric and pediatric age group, as there are not suppose working in agriculture field. There were 42% farmer, 20% labourer, 20% student and 18% housewife for organo phosphorous consumption, again it is well formulated that male gender, mainly workers in the field as farmer and labourer. 18% female patients were housewife and rarely the students come across with organo phosphorous poisoning. 78% of patients were having suicide background and 22% with accidental farmers and labourer concern with financial and household problems may have consumed organo phosphorous compound as suicidal attempt. Accidental consumption may be there in geriatric and pediatric age group, female patient consumption may be correlated to male preponderance and male atrocity in rural India.

Our observation coincides with studies of *V Agarwal* 2018 et al.[1], *G. V Rao* 2016 et al.[39], *Y. Honnakatti* 2018 et al.[44], *V. kothiwale* 2020 et al.[45], *S Mukherjee* 2020 et al.[46]

In agriculture market in various organo phosphorous compound are under selling at the counter, these are easily available throughout year, but peak in sell is usually in months of July to October. Now due to recent advances in agriculture field and to increase the yield many of the organo phosphorous compound spraying under taken for vegetable, food grain, fruits for better growth and to avoid insecticides affection. In India various organo phosphorous compounds are used for agriculture purpose but due to poverty, economic crisis, quarrel these may be badly used for the suicide purposes, due to easy availability of these compounds, with low prices are used these purposes. Among these dimethoate is commonly used followed by chlorpyrifos compounds many of the authors are also came across organo phosphorous poisoning cases with these compounds.

Our study coincides with these authors, as far as organo phosphorous poisoning is conceal on arrival in casualty, the relative or when the patient conscious was asked, approximate quantity of organo phosphorous consumption and it was around mean 27.30 ± 11.88. After receiving call from casualty, the status of the patient was evaluated as whether unconscious, semiconscious or drowsy, responding to verbal command and fully conscious, on admission, many of the patient were brought semiconscious or drowsy, at 6 hour these patient were drowsy or semiconscious, at 12 hour 6% patients developed unconsciousness, 10% semiconscious and 84% were conscious at responding to verbal command, up to 24 to 96 hours condition of patient remain same as far as status of concealed. The condition of patient usually depends upon volume of compound consumed, whether consumed, empty stomach or fully stomach whether patient was accompanied with anybody or alone place of consumption or site of consumption, resources available for transportation, distance from the hospital or medical aid and time required to reached the hospital. All these variable cannot be pinpointed or given importance for the condition of patient hence we have consider these patient and evaluated the status accordingly without going to detail above factor, *G. V. Rao* 2016 et al.[39], *M. Sungur* 2001 et al.[30] and *James O. J. Davis* 2008 et al.[34] have also evaluated their patient when they reached the casualty, they have also not given much importance above variable, hence our study coincides with the studies of above authors. On examination the size of pupil and reaction to light was evaluated in every patient.

Organo phosphorous compound directly affect, the size and reaction of pupil denoting the severity of status of patient after consumption, size of pupil and reaction to light, governs response of patient to the treatment, consider to be important criteria to follow treatment in the patient, to reaction to

light is usually criteria for cerebral circulation stating hypoxia damage secondary to respiratory inadequacy, size of pupil governs the need of atropinization in the patient. In the present study 16% patient pupil were pinpoint and sluggishly reacting to light, 84% patient pupil were semi dilated to dilated and were reacting to light, 8% of patient, at 96 hours also shown pinpoint and sluggish reaction in the followed. *D. R Murthy* 2013 et al.[35], *V. Agrawal* 2018 et al.[1], *J. V. Peter* 2014 et al.[37], *V. Kottiwale* 2020 et al.[45] have used size and reaction to light of pupils for their treatment modality in their patient. In organo phosphorous poisoning there is inhibition of acetyl cholinesterase enzyme leading to accumulation acetylcholine at synaptic cleft causing overstimulation of iris circular muscle causing miosis of pupil (M3 receptor). Some patient of organo phosphorous poisoning were presented with convulsion and 84% patient presented without convulsion, at 6 hours and the patient with responded well with treatment convulsion were under compound. *Syed. M. Ahmed* 2014 et al.[2] have also noted presence of convulsion in their study. According to them many times, convulsions are secondary to hypoxia due to respiratory inadequacy. The convulsions were tonic-clonic as generalized due to Incordinate muscle fasciculation. Organo phosphorus compound directly affect neuromuscular function, giving flaccid paralysis due to abundant of acetylcholine release at synaptic cleft. There by affecting neuromuscular transmission and muscle contraction.

According to Bromage scale muscle power was assed or medical council scale, motor power graded as grade 0 complete paralysis, grade 1 flickering contraction, grade 2 motor power detectable when gravity excluded, grade 3 motor power against gravity, gravity 4 normal power. In present study, on admission motor power was assessed on according to Bromage scale and complete paralysis was noted in 2% patient. Grade 1 power noted 6%, grade 2-2%, grade 3-6% and no paralysis or grade 4 was noted 84% of the patient. At 6 hours 10% of the patient showed improvement at 12 hours to 48 hours when meticulously observed. Organo phosphorous compound responded to the treatment to atropinization and PAM doses, hence the muscle power was regaining to the normal after receiving the treatment in these patient. *G. V. Rao* 2016 et al.[39], *D. Murthy* 2013 et al.[35], *Michael Eddlestone* 2006 et al.[33], *J. V. Peter* 2014 et al.[37] have also correlated motor power with the treatment response of patient after atropinization and PAM therapy. Our observation can be explain on these around as per motor power conceals. Organo phosphorous compound were primary effect of paralysis of muscle power resulting in generalized muscle weakness particularly limb musculature, abdominal and respiratory muscle weakness or paralysis resulting respiratory inadequacy or complete respiratory failure requiring ventilator support.

In present study 20% patients had respiratory inadequacy from admission and in subsequent period 80% patients had normal, adequate respiration out of these 10 (20%) patients, 9 patients required immediate end tracheal intubation and mechanical ventilation. Out of these 10 patients, 8 patients (16%) succumbed to death in spite of artificial ventilation, meticulous observation and necessary treatment. In present study 8 patients succumbed to death on 1 day 3 patients death followed by 2 day 1 patient death followed by 4 day 2 patients death was noticed and up to 7 day 2 patients death occurred. *V. Agrawal* 2018 et al.[1], have described treatment modality in their patient as far as treatment concealed all patient had given through stomach wash, their cloths were removed and body was clean to avoid further absorption of organo phosphorous compound, patient with respiratory failure required endotracheal intubation with ventilator support was given. These patients initially received intravenous atropine 2-3 gm bolus and was repeated 5-15 minutes depending upon severity of poisoning. Drying of secretion was taken as sign of atropinization and pulse rate 120/min was taken as sign of atropinization, then it was followed drip of atropine to maintain circulatory level, PAM was given to patient, who had consumption organo phosphorous compound. Initial dose of atropine 2 gm followed drip of 2.5 to 5 gm in dextrose normal saline was given, intravenous diazepam was given to prevent restlessness and convulsion. Acetyl cholinesterase level were monitored frequently to correlate dose of atropine, PAM and clinical response of patient. The severity of organo phosphorous poisoning is many times certain either on clinical or laboratory assessment.

These organo phosphorous compound act by inhibiting both cholinesterase and pseudo cholinesterase activity, these leads accumulation acetylcholine at synapse causing overstimulation of receptor and disruption of neurotransmission in both central and peripheral nervous system, hence it is necessary to estimate serum acetyl cholinesterase assessed severity of organo phosphorous poisoning. These action of organo phosphorous compound is counter acted by atropinization and PAM therapy. It was further support with ventilator

therapy as and when required. *G. V. RAO* 2016 et al.[39], *D. R. Murthy* 2013 et al.[35], *M. Sungur* 2001 et al.[30], *Michael Eddleston* 2006 et al.[33], *J. V. Peter* 2014 et al.[37], *T. Yardan* 2016 et al.[41], *V. Honnakatti* 2018 et al.[44], *V. Kothiwale* 2020 et al.[45] were of the same opinion, *V. Agarwal* et al.[1], and they have followed same treatment modality in their patient. Our observation can be explain on above ground and our treatment modality coincides with *V. Agarwal* et al.[1] and others. Organo phosphorous compound poisoning is usually confirmed by levels of butyryl cholinesterase or RBCs Cholinesterase level, acetyl cholinesterase level depression less than 20% correlated to significance organo phosphorous poisoning, while 20 to 40% depression signifies moderate poisoning, here one has to differentiate the other causes low level of acetyl cholinesterase. They are several method for enzymatic assess, as calorimetric method, interferometry, surface acoustic waves, enzyme biosensors etc. the biosensor works on principle that organo phosphorus compound act by inhibiting acetyl cholinesterase which can assessed by direct and indirect. In direct method thiocholine produced by hydrolysis of acetylcholine in presence of water and acetyl cholinesterase level measured, organo phosphorus compound causes acetyl cholinesterase inhibition decreasing thiocholine level.[47-50] In present study acetylcholine cholinesterase estimation carried out by Gene Cholinesterase Butyryl Thiocholine Method, principle behind is cholinesterase catalyses the hydrolysis butyrylcholine, forming butyrate and thiocholine. Thiocholine reduces yellow potassium hexacyanoferrate to colourless potassium hexacyanoferrate. The decrease of absorbance at 405 nm is proportional to the activity of CHE in sample.

Butyrylthiocholine + H_2O <cholinesterase> Thiocholine + Butyrate

2 Thiocholine +2 $[Fe(CN)^6]3$+2 OH→Choline +H_2O+2 $[Fe(CN)^6]4$

Reference Value

Children: 4500-11500U/L

Males upto and above 40 Years: 4000-11500U/L

Females upto and above 40 Years: 3830-10800 U/L

At 6 hours and onward as the pseudo cholinesterase levels start to increasing requirement of ventilator support was corresponding to decrease. It was significantly noted in patient succumbed to death when compare to those patient who responded to treatment *V. Ararwal* et al.[1] in their study emphasize clinical correlation of acute organo phosphorous poisoning with serum cholinesterase activity. They have also noted low levels of serum cholinesterase signifies severe poisoning and correlated to response of the patient to the treatment modality *Syed M. Ahmed* 2014 et al.[2], *G. V. Rao* 2016 et al.[39], *D. R. Murthy* 2013 et al.[35], *T. Yardan* 2016 et al.[41], *V. Honnakatti* 2018 et al.[44], *V. Kothiwale* 2020 et al.[45], *S. Mukhaerjee* et al.[46] all have coated correlation of serum cholinesterase levels to the severity of organo phosphorous compound poisoning. They have signifies importance of pseudo cholinesterase as an aid to treatment modalities for better outcome in patient of organo phosphorous poisoning. Our study was also aim to signify importance of estimation of serum cholinesterase in treatment of organo phosphorous poisoning.

CONCLUSION

- In present study 50 cases of organophosphorus compound poisoning admitted to our tertiary care centre.
- Commonest age group 21 to 30 years and 31 to 40 years.
- Males were the most common victims 38 (76%).
- Commonest occupation was farmer 21 (42%).
- Maximum number of the patient consumed organophosphorus compound for suicide purpose 39 (78%).
- Dimethoate and monocrotophos were the most common compound used by the patients for poisoning.
- Status of patient, convulsion, pinpoint pupil, fasciculation, motor power (complete paralysis) were significantly associated with op compound patient.
- Patient who had lower level of serum cholinesterase within 24 hours had increased mortality.
- Serum cholinesterase is a useful marker for predicting clinical outcome in op poisoning as marked reductions are associated with increased need for ventilator support, atropine requirement, duration of hospital stay and outcome.
- Serum cholinesterase levels correlated well with clinical manifestation, severity of poisoning, ventilator support required or not and outcome.

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Case Report

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Anesthetic Management in a Case of Rett Syndrome: A Case Report

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Abstract

Rett syndrome (RS) is a progressive neurological disorder that almost exclusively affects females. It is characterized by severe mental retardation following a period of normal development during childhood. Classical features include autism, stereotypical hand movements, seizures, microcephaly and abnormal respiratory control. Anesthetic challenges in patients with RS include difficult airway, seizure management, positioning, increased sensitivity to sedatives, autonomic dysfunction, anesthesia triggered episodes of apnoea, hypoxemia and sudden death. Here, we describe the successful anesthetic management of a 13-year-old patient with RS exhibiting most of these features who underwent laparoscopic SOS open ovarian cystectomy and hysterectomy.

Keywords: Rett Syndrome, seizures, anesthesia

Key Messages: The estimated prevalence of Rett syndrome is 25% among the population of severely retarded females and are very likely to present for some procedure before a practicing anesthesiologist. Here we have discussed its pathophysiology, anesthetic implications and successful management in a child posted for gynaecological procedure under general anesthesia with a supportive multi-specialty team work.

INTRODUCTION

Rett syndrome (RS) is a progressive neurological disorder that almost exclusively affects females.[1] Incidence is 0.5 in 10,000 female births, being rare in boys.[2] It is characterized by severe mental retardation following a period of normal development during childhood. It is only second to Down syndrome as a cause of mental retardation in females.[3] Classical features include autism, stereotypical hand movements, seizures, microcephaly and abnormal respiratory control. Patients with RS are extremely sensitive to sedatives and exhibit slow recovery from anesthesia.[4] Anesthesia challenges include difficult airway, seizures management, positioning due to musculoskeletal involvement, anesthesia triggered apnoea episodes, hypoxemia and sudden death.[5,6] Here we discuss some of the anesthetic challenges we overcame in the successful management of a

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Rett child.

CASE REPORT

A 13-year-old, 30 kg female, a known case of Rett syndrome had presented in emergency with pain abdomen. Following acute pain management and further investigations she was diagnosed as having ruptured left ovarian cyst and was scheduled by the gynecologists' team for laparoscopic SOS open ovarian cystectomy and hysterectomy. Birth history revealed that she was delivered normally at full term following an uncomplicated antenatal period of the mother. Her developmental milestones were delayed till 13 months of age. Subsequent course of illness revealed history of regression of milestones, history of seizures on irregular treatment with sodium valproate, difficulty in swallowing solid food, vomiting, repetitive hand movements, frequent upper respiratory tract infections and frequent hospitalizations till the age of 8 years Paediatricians took care of her peri-operative management and reinstituted sodium valproate (10 mg/kg/day) therapy.

The pre-anesthesia check-up further revealed that she had frail habitus, was afebrile and hypertonic. Her head circumference was small at 45 cm, which is less than 3rd percentile. Airway was normal. Mild thoracic scoliosis was present. The extremities were cool, grade 1 clubbing was noted while cyanosis was absent. Her vitals revealed heart rate of 102/min, blood pressure (BP) – 100/66 mmHg and oxygen saturation – 99% on room air. On auscultation, the heart-sounds and chest were normal.

Preoperative laboratory values were within normal range. The ECG and chest X-ray were unremarkable. Her CT abdomen was performed uneventfully a day prior to the surgery under intravenous sedation using midazolam, 1 mg and titrated dose of propofol.

The patient had her last seizure episode on the morning of laparoscopic surgery which was managed by a loading dose of levipil, 20 mg/kg over 15 minutes.

The patient was calm on arrival to operation theatre. A 22 G peripheral intravenous line was in-situ with ringer lactate on flow. Patient had received aspiration prophylaxis, antacid pantoprazole 30 mg and antiemetic, ondansetron 3 mg intravenously preoperatively in the ward. In OT, standard monitors (ECG, non-invasive BP, pulse oximeter) were attached and modified rapid-sequence induction was done using sedation with midazolam (0.6 mg) and fentanyl (30mcg) followed by IV propofol and rocuronium (0.8 mg/kg). A 6 mm ID endotracheal tube was passed under vision and ventilation was controlled using circle system. Anesthesia was maintained with oxygen (50%), air and sevoflurane (1-2%). Oro-gastric tube was passed to empty the gastric contents and to keep the stomach deflated during the laparoscopic procedure. A second IV line (20 G jelco) was placed to infuse fluids perioperatively. Patient was kept warm using a hot line intravenous fluids and a warm blower. Maintenance dose of levipil (10 mg/kg) was infused over 15 minutes. Pre-op ABG was within normal range, however no intra-arterial catheter was maintained. Peri-op monitoring also included end tidal carbon dioxide, inspired and expired oxygen and sevoflurane concentration, oro-pharyngeal temperature and urine output.

The laparoscopic procedure was abandoned after an hour in view of technical difficulty and converted to open ovarian cystectomy and hysterectomy. The estimated blood loss was approximately 300 ml which was replaced with crystalloids. Her temperature dropped to 34 degrees Celsius, which was managed by aggressive warming using hotline for fluids and an additional warm air blower. All other hemodynamic parameters were maintained throughout the surgery. For postoperative pain relief, bilateral transverse abdominis plane (TAP) block with 12 ml of 0.25% bupivacaine on either side was performed.

At the end of the surgery, anesthesia was reversed with neostigmine (0.05mg/kg) and glycopyrrolate (8mcg/kg). The patient was extubated on confirming wakefulness, good muscle tone, regular respiration without any apnoeic spells along with adequate respiratory efforts. She was shifted to the paediatric intensive care unit for post-operative monitoring and transferred to the ward the following day. She had an uneventful recovery and was discharged on the fifth post-operative day.

DISCUSSION

Rett syndrome, described in 1966, is a rare genetic neurological disorder affecting exclusively girls.[1] It is hypothesised that it is an X-linked dominant mutation on $MECO_2$ gene.[2]

Clinical features are remarkably consistent with affected infants having normal development until approximately 6 to 18 months of age following which there is rapid developmental regression leading to dementia and autism.[1] Acquired skills

such as purposeful hand movements and ability to communicate are lost and is replaced by a constant, repetitive hand washing movement a hallmark feature of Rett syndrome.[7] Wide range of disability are exhibited including choreoathetosis, dystonia, myoclonic jerk and stereotypic automatism.[1,8] Chronic disease leads to diffuse and progressive muscle wasting, growth stagnation of weight, stature and particularly microcephaly.[1] Seizures may be present in some cases (15%).

The estimated prevalence of Rett syndrome is 25% among the population of severely retarded females[9] and are very likely to present for some procedure before a practicing anesthesiologist. Hence, it is pertinent that we understand its pathophysiology and anesthetic implications.

Anesthetic challenges of significance in managing these children are lack of cooperation, muscle wasting, abnormal continuous limb movement, abnormal respiratory control, difficult positioning due to scoliosis and chest deformity, vasomotor instability, metabolic abnormalities increased lactic acid level, altered sensitivity to painful stimuli.

Non-depolarizing muscle relaxant is preferred over succinylcholine for its potassium increasing property in such patients with neuro-muscular dystrophy.[10] Risk of aspiration also exists. Hence, we did rapid sequence intubation using rocuronium in this case.

There is respiratory impairment in these patients due to muscle wasting and thoracic deformity. Polygraphy studies reveal normal breathing during sleep compared to irregular breathing with periods of apnoea during wakefulness which may lead to oxygen desaturation and loss of consciousness during a severe episode.[11] This has been explained by the impairment of behavioural control of breathing a forebrain function. Cirignotta et al. have suggested that the frequent desaturations may cause permanent hypoxic damage and contribute to the progressive cerebral deterioration.[12] Rapid desaturation has been explained by high expiratory position of the diaphragm during apnoea. However, the influence of anesthetic agents on respiratory patterns during perioperative period is not known. The increased sensitivity to sedation has been reported by Konarzewski in his patient who was administered trimeparazine and ketamine premedication followed by halothane-nitrous-oxygen induction and maintenance in a spontaneously breathing child.[4] The prolonged sedation is expected with this type of premedication into the postoperative period although a causal relation between the two has not been established. The parents of our patient did not give history of irregular breathing pattern or apnoea, although a negative history is usually unreliable and all RS patients should be considered as having disorder of respiratory control and resultant episodes of desaturation. We administered minimum dose of sedation and opioid as per weight of the patient and she did not exhibit any breathing variability during the post-operative period and continued to maintain normal oxygen saturation.

Our patient had no symptoms of respiratory impairment and pre-op chest X-ray revealed no evidence of recurrent aspiration. Preoperative ABG was within normal range, hence we did not maintain a continuous arterial line perioperatively, although it is indicated in patients who have respiratory symptoms. Presence of mild thoracic scoliosis in our patient, a classic feature of Rett syndrome, is usually neurogenic in origin, cautioning careful positioning under anesthesia.[13]

Cardiovascular considerations include vasomotor instability leading to cool extremities. Our patient had inadvertent hypothermia intraoperatively possibly due to heat loss contributed by large exposure of the operative field in a frail habitus. Hypothermia was managed using hotline and an additional warm air blower. All other hemodynamic parameters were normal. Aggressive attempts to prevent heat loss should be practiced.

Metabolic abnormalities include excessive ammonia level; however, it is not a consistent finding.[1]

Pain management was done using TAP block before reversal and institutional pain management protocol was followed postoperatively with intravenous and/or oral non-opioid analgesics.

CONCLUSION

Rett syndrome is a debilitating neurological disorder, exclusively occurring in young females. Anesthetist awareness of its peculiar anesthetic challenges involving control of seizures, abnormal continuous movement of limbs and vasomotor instability is important. Minimal use of sedatives and using regional analgesia for post-operative pain relief is the technique of choice. This report spotlights this rare syndrome and the successful management of such a patient with coordinated team work with specialities like paediatrics, pediatric intensivists, gynecologists along with the anesthesiologists.

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Conflict of Interest: Nil

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Case Report

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Fluoroscopy Guided Lumbar Facet Joint Block as a Diagnostic Tool in the Evaluation of Chronic Low Back Ache

Khaja Javed Khan[1], Satish Kumar M N[2], Wiquar Ahmed[3], Prashanth R Putran[4]

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Abstract

Acute low back pain is a common cause of pain in majority of adult population. Facet joints are potential source of pain in low back pain (LBP) and its prevalence increases with age. Our case report is about a 34 year old male patient came with chief complaints of chronic low back ache, more on the left side, insidious in onset, non radiating not associated with tingling or numbness. Pain aggravates on walking, sitting to standing posture and left side movements. His Numerical rating scale (NRS) was 7 and Verbal rating scale (VRS) was moderate. On palpation patient had left para median tenderness more at L5-S1 area. The Lasegue straight leg raising test and flexion, abduction, external rotation (FABER) were also negative. We decided to proceed with diagnostic block of left L5-S1 facet joint with 1ml 0f 1% lignocaine and our patient had significant pain relief of about 80%.

Keywords: Low Back Pain; Facet Joint; Diagnostic block.

INTRODUCTION

Acute low back pain is a common cause of disability in both young and middle-aged individuals and is prevalent in 4-33% of the population. Facet joint pain contributes to a significant proportion of this prevalence.[1] The lumbar facet joints are innervated by the medial branch of the dorsal ramus of the nerve exiting at the same level and the medial branch of the nerve one level above. The innervation of L5-S1 facet joint differs from the other lumbar joints since it is innervated by the medial branch of L4 and the dorsal ramus of L5.[2] Lumbar facet joints (FJs) constitute a common source of pain and remain a misunderstood, misdiagnosed and improperly treated pathology.[3] Clinical facet joint syndrome is defined as a unilateral or bilateral back pain radiating to one or both buttocks, sides of the groin, and thighs, and stopping above the knee. However, in some cases, patient symptoms in the setting of low back pain may lack specificity, as facet joints may mimic the pain caused by herniated discs or compressed roots. History and clinical examination may suggest, but not confirm FJs as the source of pain. A positive diagnostic facet joint block usually

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confirms facet joints as the source of chronic back pain.[4]

CASE HISTORY

A 34 year old male patient software engineer by occupation came to our outpatient department with chief complaints of low back ache since 3 and half months more on the left side. Pain was insidious in onset, non radiating, moderate dull aching and not associated with tingling or numbness. Pain aggravated on walking, sitting to standing posture and got relieved on rest. On pain assessment scale his Numerical rating scale (NRS) was 7 and Verbal rating scale (VRS) was moderate. No H/O of accident, injury, other joint pain. Patient had taken a course of NSAIDs along with muscle relaxants and physiotherapy but there was no improvement in his pain.

On Examination, during inspection gait, spine curvature and contour of the muscles on either sides appeared to be normal. On palpation patient had left para median tenderness more at L5-S1 area, no localised rise of temperature, no sensory and motor deficit, all reflexes were intact. Patient complained of pain on left lateral bending and left side rotation. The Lasegue straight leg raising test was negative and flexion abduction external rotation (FABER), flexion adduction internal rotation (FAIR) tests, Sacroiliac joint tenderness were also negative.

We thought of differential diagnosis of left side facet joint arthropathy and myofascial pain syndrome. Hence we decided to proceed with diagnostic block of left L5-S1 facet joint.

After taking written informed consent patient was shifted to operation theatre, painted and draped. Under strict aseptic precautions under fluoroscopy guidance left L5-S1 facet joint was identified as most tender point on palpation.(Fig. 1)

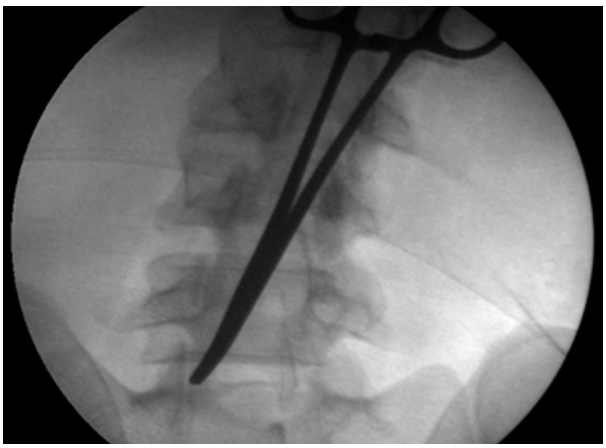

Fig. 1: Pointer placed at Left L5-S1 facet joint.

and hence we decided to do left L5-S1 facet intra-articular injection using 22g spinal needle (Fig. 2).

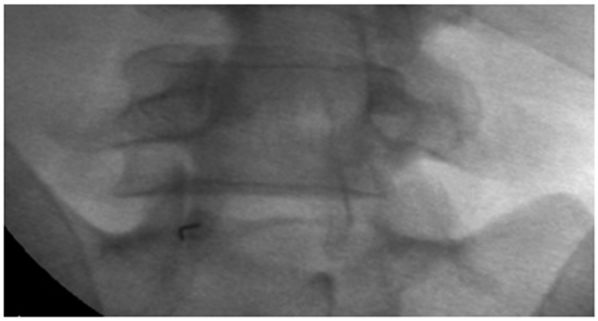

Fig. 2: 22G spinal needle placed at Left L5-S1 intraarticular area.

Intra-articular facet joint block was given with 1ml of 1% lignocaine after confirming negative aspiration. After the procedure patient was monitored for vitals and pain assessment. There was a significant improvement in pain score for NRS from 7 to 2 and VRS moderate to mild after 30miutes of procedure. Patient had significant pain relief of about 80%.

DISCUSSION

In 1980, Bogduk and Long demonstrated that pain in the back and thigh could be produced by injecting 6% hypertonic saline solution in the regions of the medial branch. Medial branches of the dorsal ramus of the spinal nerve are distributed on the external periosteum, facet joints, and ligamentous connections of the neural arches and the sinuvertebral nerve. Low back pain may originate from the external periosteum, facet joints, muscle, and the ligamentous connection of the neural arches.[5]

In our case the patient had chronic low back pain at left lower facet joint area with all the clinical tests were not in favour of facet joint and sacroiliac joint involvement. Myofascial pain syndrome was one of the differential diagnosis in our case but confirmation was yet to be made. Hence we decided diagnostic block for left side intraarticular(IA) facet joint block at L5-S1 levels with 1ml of 1% lignocaine.

In a retrospective study by Helbig and Lee performed in 22 patients, the authors sought to correlate response to an IA facet injection with diagnostic criteria that included pain in the back, buttock, leg or groin, signs of spasms or deformity, paravertebral tenderness, pain with motion and neurological examination. Back pain radiating to the groin or leg, pain worsened with extension-rotation and well-localized paraspinal tenderness were associated with a positive outcome, which

was defined as prolonged relief lasting >6 months. Pain radiating below the knee was negatively associated with a positive response to facet blocks.[6]

Seo JH et al. compared the efficacy of combined treatment with medial branch block and facet joint injection in axial low back pain and concluded that combined treatment can reduce axial low back pain and improve secondary functional degradation, but it required longer intervention time and did not have pain relief effect superior to that of medial branch block and facet joint injection alone.[7]

Facet joint disturbances can be responsible for 10% to 50% of all cases of chronic lumbar pain.[8-11] However, clinical history or physical examination cannot identify facet joint alterations as the origin of pain, nor does imaging. The only tool to identify facet joint alterations as the cause of pain is the verification of an analgesic response to anesthetic injections into the facet joints or at their nerve supplies and medial dorsal branch blocks are easier to perform. A positive result (i.e., pain relief) would mean that the facet joint is the site from which the pain originates.[12]

CONCLUSION

This case report describes the management of patient with low back ache with diagnostic block at L5-S1 facet joint when all other treatment options were not producing pain relief. Subsequently this patient can be treated with therapeutic lumbar facet joint intervention if pain recurs.

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Epidural Anesthesia for Intracapsular Neck of Femur Fracture with Pituitary Macroadenoma

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Abstract

Anesthesia for patient with pituitary adenoma posted for non-neurosurgical surgeries is a challenge to the anesthesiologist with the risk of sudden change in intracranial dynamics during administration of spinal anesthesia or during stress response of general anesthesia. We reported a case of intracapsular neck of femur fracture with pituitary macroadenoma managed with epidural anesthesia.

Keywords: Epidural anesthesia; Femur fracture; Pituitary macroadenoma.

INTRODUCTION

Pituitary adenomasare classified into microadenomas (<10mm), macroadenomas (10 mm), and giant adenomas (40 mm).[1] Pituitary carcinomas with distant metastases are rare, occurring in 0.1% to 0.2% of cases. If an MRI shows the tumor impinging on the optic chiasm, then formal visual field testing is indicated.[2] An evaluation for hypopituitarism should be carried outin all patients with macroadenomas and even large (6-9 mm) microadenomas. Diabetes insipidus is rarely seen with pituitary adenomas. About two-thirds of pituitary adenomas may secrete excess hormones.[3]

Pituitary tumours may present in different conditions such as, hormonal hyper secretory syndrome like hyperprolactinomas, acromegaly and Cushing disease or with mass effect causing visual disturbance and signs of raised intracranial tension. Sometimes they present with non-specific symptoms like infertility, headache, epilepsy, pituitary hyposecretion or may be detected during imaging for some other condition.[4]

Anesthesia for patient with pituitary adenoma posted for non-neurosurgical surgeries is a challenge to the anesthesiologist with the risk of sudden change in intracranial dynamics during administration of spinal anesthesia or during stress response of general anesthesia. There is a chance of increase in tumour size during antenatal period.[5] A careful assessment of pituitary function and a screening of visual field and fundus examination are essential to rule out any mass effect.[6] We reported a case of intracapsular neck of femur fracture with

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pituitary macroadenoma managed with epidural anesthesia.

CASE REPORT

A 50 years old male patient complaint of pain and swelling in the left hip, inability to bear weight in left lower limb. Patient gave history of fall at home. Patient gave history of road traffic accident while on 2 wheeler hit by 3 wheeler 1 day ago. Patient past medical history was non-contributory.

A thorough examination was carried out. Patient was lying supine with both axis at same level. Hip had flexion, external rotation with shortening present. Range of motion was painful and limited. Popliteal artery, posterior tibial artery and dorsalis pedia artery was non-palpable. Chest and pelvic compression was negative. Left SLRT was positive and left was negative. No spinal bone was tender. On X- ray (AP and lateral), patient was diagnosed as intracapsular neck of femur fracture. Injury severity score (ISS) was 9. Pawwells angle was -60 degree.

Laboratory tests showed serum testosterone 234 mg/dl, LH- 3.66 mg/dl, FSH- 8.55 mg/dl, GH- 0.065 µg/ml, serum cortisol 6.4 µg/dl, prolactin 11.84 µg/dl, TSH-3.8 µg/dl, T4-6.5 µg/dl, T3- 0.86 µg/dl. MRI revealed suprasellar SOL 3.3X 2.1X 3.2 cm. Hormone profile was suggestive of hypopituitarism. Patient was referredto ophthalmology department for fundoscopy and on examination no abnormality was found. Patients was planned for surgery.

Patient was NBM pre-operatively. PAC review was done. Soap water rinse was done 2 hours before surgery. Preparation and marking of the limb followed by administration of inj. Tetanus 0.5 IM stat was done. Inj. lignocaine test was done. Patient was informed regarding the anesthetic options and perioperative risk involved in regional and general anesthesia. Patient preferred to remain awake during delivery. Aspiration prophylaxis was given 30 min before surgery. Patient was monitored using electrocardiogram, pulse-oximeter and non-invasive blood pressure. Under aseptic precaution an 18 G epidural catheter was placed at L3-L4 inter space using 18G Tuohy needle. Epidural space confirmed with loss of resistance technique and test dose of 3 ml of 1.5% lignocaine with adrenaline 5 µg/ml was given. Nine ml of 2% lignocaine was given in incremental doses after negative aspiration for blood and CSF. A wedge was placed under right side of pelvis to minimize aorto-caval compression. Level of analgesia was T-8. Bromage scale was 4. Bipolar cemented hemiarthoplasty under SA was performed. Patients condition was stable.

DISCUSSION

Approximately 10% of unselected pituitaries (meaning those from individuals without known pituitary disease) examined at autopsy contain pituitary adenomas.[7] Magnetic resonance imaging (MRI) scans of normal volunteers also show a 10% prevalence, but other pathologic entities may have a similar appearance, such as Rathke cleft cysts and metastatic tumors.[8] Not all patients with pituitary tumors develop symptoms because most tumors remain small and most do not secrete hormones in excessive amounts.[9] Knowledge of the normal anatomy and physiology of pituitary gland is necessary to understand the pathophysiological effects relevant to anesthesia and for appropriate preoperative preparation, intra and postoperative management of complications.[10] A careful assessment of pituitary function and a screening of visual field and fundus examination are essential to rule out any mass effect.[11] Mass effect of a tumour on adjacent structures is more likely to occur with non-functioning macroadenomas. By compression of pituitary gland in sellaturcica by hemorrhage into pituitary or very rarely by postpartum pituitary infarction (Sheehan's syndrome). Compression of optic chiasm results in bitemporal hemianopia. In pituitary apoplexy, third cranial nerve palsy can occur.[12]

We avoided general anesthesia in this patient because of the possible risk of an acute increase in intracranial pressure associated with laryngoscopy and tracheal intubation. The patient preferred regional anesthesia as well. Also, an awake patient would alert early in the event of an intracranial complication. We avoided spinal anesthesia because of possible decrease in intracranial pressure due to cerebrospinal fluid leak in postoperative period, if multiple attempts were made. *Akashi N* et al.[13] reported a caesarean section successfully performed with epidural anesthesia, the pituitary tumour was removed trans-sphenoidally under general anesthesia. Therefore, we decided to go ahead with epidural anesthesia. There are reports of safe use of epidural block for labour analgesia and caesarean section in patients with intracranial tumours. We had taken care to administer the epidural drug slowly to minimise this effect and there was no adverse event in the intra and postpartum period.

CONCLUSION

The epidural anesthesia may be used safely for in patients with intracapsular neck of femur fracture with pituitary macroadenoma. The epidural placement should be performed by an experienced anesthesiologist preferably with ultrasonographic guidance.

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Manuscripts must be prepared in accordance with "Uniform requirements for Manuscripts submitted to Biomedical Journal" developed by international committee of medical Journal Editors

Types of Manuscripts and Limits

Original articles: Up to 3000 words excluding references and abstract and up to 10 references.

Review articles: Up to 2500 words excluding references and abstract and up to 10 references.

Case reports: Up to 1000 words excluding references and abstract and up to 10 references.

Online Submission of the Manuscripts

Articles can also be submitted online from http://rfppl.co.in/customer_index.php.

I) First Page File: Prepare the title page, covering letter, acknowledgement, etc. using a word processor program. All information which can reveal your identity should be here. use text/rtf/doc/PDF files. Do not zip the files.

2) Article file: The main text of the article, beginning from Abstract till References (including tables) should be in this file. Do not include any information (such as acknowledgement, your name in page headers, etc.) in this file. Use text/rtf/doc/PDF files. Do not zip the files. Limit the file size to 400 Kb. Do not incorporate images in the file. If file size is large, graphs can be submitted as images separately without incorporating them in the article file to reduce the size of the file.

3) Images: Submit good quality color images. Each image should be less than 100 Kb in size. Size of the image can be reduced by decreasing the actual height and width of the images (keep up to 400 pixels or 3 inches). All image formats (jpeg, tiff, gif, bmp, png, eps etc.) are acceptable; jpeg is most suitable.

Legends: Legends for the Fig.s/images should be included at the end of the article file.

If the manuscript is submitted online, the contributors' form and copyright transfer form has to be submitted in original with the signatures of all the contributors within two weeks from submission. Hard copies of the images (3 sets), for articles submitted online, should be sent to the journal office at the time of submission of a revised manuscript. Editorial office: Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi – 110 091, India, Phone: 91-11-79695648, Cell: +91-9821671871. E-mail: author@rfppl.co.in. Submission page: http://rfppl.co.in/article_submission_system.php?mid=5.

Preparation of the Manuscript

The text of observational and experimental articles should be divided into sections with the headings: Introduction, Methods, Results, Discussion, References, Tables, Fig.s, Fig. legends, and Acknowledgment. Do not make subheadings in these sections.

Title Page

The title page should carry

1) Type of manuscript (e.g. Original article, Review article, Case Report)

2) The title of the article, should be concise and informative;

3) Running title or short title not more than 50 characters;

4) The name by which each contributor is known (Last name, First name and initials of middle name), with his or her highest academic degree(s) and institutional affiliation;

5) The name of the department(s) and institution(s) to which the work should be attributed;

6) The name, address, phone numbers, facsimile numbers and e-mail address of the contributor responsible for correspondence about the manuscript; should be mentoined.

7) The total number of pages, total number of photographs and word counts separately for abstract and for the text (excluding the references and abstract);

8) Source(s) of support in the form of grants, equipment, drugs, or all of these;

9) Acknowledgement, if any; and

l0) If the manuscript was presented as part at a meeting, the organization, place, and exact date on which it was read.

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.

Introduction

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

Methods

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.

Reports of randomized clinical trials should be based on the CONSORT Statement (http:// www. consort-statement. org). When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000 (available at http://www.wma. net/e/policy/l7-c_e.html).

Results

Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Extra or supplementary materials and technical details can be placed in an appendix where it will be accessible but will not interrupt the flow of the text; alternatively, it can be published only in the electronic version of the journal.

Discussion

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.

References

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.

More information about other reference types is available at www.nlm.nih.gov/bsd/uniform_requirements.html, but observes some minor deviations (no full stop after journal title, no issue or date after volume, etc.).

Tables

Tables should be self-explanatory and should not duplicate textual material.

Tables with more than 10 columns and 25 rows are not acceptable.

Table numbers should be in Arabic numerals, consecutively in the order of their first citation in the text and supply a brief title for each.

Explain in footnotes all non-standard abbreviations that are used in each table.

For footnotes use the following symbols, in this sequence: *, ¶, †, ‡‡,

Illustrations (Fig.s)

Graphics files are welcome if supplied as Tiff, EPS, or PowerPoint files of minimum 1200x1600 pixel size. The minimum line weight for line art is 0.5 point for optimal printing.

When possible, please place symbol legends below the Fig. instead of the side.

Original color Fig.s can be printed in color at the editor's and publisher's discretion provided the author agrees to pay.

Type or print out legends (maximum 40 words, excluding the credit line) for illustrations using double spacing, with Arabic numerals corresponding to the illustrations.

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We need the Ethics committee approval letter from an Institutional ethical committee (IEC) or an institutional review board (IRB) to publish your Research article or author should submit a statement that the study does not require ethics approval along with evidence. The evidence could either be consent from patients is available and there are no ethics issues in the paper or a letter from an IRB stating that the study in question does not require ethics approval.

Abbreviations

Standard abbreviations should be used and be spelt out when first used in the text. Abbreviations should not be used in the title or abstract.

Checklist

- Manuscript Title
- Covering letter: Signed by all contributors
- Previous publication/ presentations mentioned, Source of funding mentioned
- Conflicts of interest disclosed

Authors

- Middle name initials provided.
- Author for correspondence, with e-mail address provided.
- Number of contributors restricted as per the instructions.
- Identity not revealed in paper except title page (e.g. name of the institute in Methods, citing previous study as 'our study')

Presentation and Format

- Double spacing
- Margins 2.5 cm from all four sides
- Title page contains all the desired information. Running title provided (not more than 50 characters)
- Abstract page contains the full title of the manuscript
- Abstract provided: Structured abstract provided for an original article.
- Keywords provided (three or more)
- Introduction of 75–100 words
- Headings in title case (not ALL CAPITALS). References cited in square brackets
- References according to the journal's instructions

Language and grammar

- Uniformly American English
- Abbreviations spelt out in full for the first time. Numerals from 1 to l0 spelt out
- Numerals at the beginning of the sentence spelt out

Tables and Fig.s

- No repetition of data in tables and graphs and in text.
- Actual numbers from which graphs drawn, provided.
- Fig.s necessary and of good quality (color)
- Table and Fig. numbers in Arabic letters (not Roman).
- Labels pasted on back of the photographs (no names written)
- Fig. legends provided (not more than 40 words)
- Patients' privacy maintained, (if not permission taken)
- Credit note for borrowed Fig.s/tables provided
- Manuscript provided on a CDROM (with double spacing)

Submitting the Manuscript

- Is the journal editor's contact information current?
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3. Inform the journal editor of the existence of any similar published manuscripts written by the author?
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