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CASE REPORT

SUCCESSFUL ANAESTHETIC MANAGEMENT OF A PATIENT WHO HAD UNDERGONE LAPAROSCOPIC CHOLECYSTECTOMY WITH EPIGASTRIC HERNIA REPAIR HAVING MYASTHENIA GRAVIS WITH ISCHEMIC HEART DISEASE, TYPE II DIABETES MELLITUS AND BRONCHIAL ASTHMA.

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Abstract -

The peri-operative anaesthetic management of a patient with Myasthenia gravis poses significant challenge to the anesthesiologist. A case of successful anaesthetic management of a Myasthenic patient with co-existing Ischemic heart disease, Bronchial asthma and Type II Diabetes mellitus who underwent laparoscopic cholecystectomy with epigastric hernia repair is reported. The authors review the anesthetic considerations in the management of a patient with Myasthenia gravis having coexisting systemic diseases.

Keywords - Myasthenia gravis, Bronchial asthma, Type II Diabetes mellitus, Ischemic heart disease, Laparoscopic cholecystectomy .

Introduction -

Myasthenia gravis is an autoimmune neuromuscular disorder leading to fluctuating muscle weakness and fatigability. Weakness is caused by circulating antibodies that block acetylcholine receptors at the post-synaptic neuromuscular junction, inhibiting the excitatory effects of neurotransmitter acetylcholine that acts on nicotinic receptors throughout neuromuscular junctions.[1]

Weakness and fatigability are made worse by exercise and have a tendency to subside after periods of rest, typically after taking anticholinesterase medication[2]. The classification of Myasthenia gravis for predicting the requirement for postoperative mechanical ventilation is important.[3] Our patient was in,

a) Osserman's Classification.[4]

Class IIA

b) Myasthenia Gravis foundation of American Clinical Classification.[5]

Class IIIB

Surgery and Anaesthesia in Myasthenia gravis patients are per se associated with increased risk of complications and death. The association with Ischemic Heart Disease, Bronchial asthma and Diabetes Mellitus for upper abdominal laparoscopic surgery makes it a greater challenge.

CASE -

A 66 year old male patient weighing 78 kg, a known diabetic, asthmatic and a known case of Ischemic heart disease presented with recurrent pain in abdomen since last 6 to 7 months. Swelling in Epigastric region since 2-3 years. He was diagnosed as a case of Myasthenia gravis 2 months ago (Neostigmine test positive) and was on treatment with Tab. Pyridostigmine (Tab.Mestinon - 60mg---0---30 mg) for this. He was also taking Tab. Glycomet GP(USV). BD since 8-10 years and Salbutamol aerosol inhalation (Aerocort Rotacaps, Cipla pvt.ltd.) sos since 10-12 years and Tab. Clopidogrel 75 mg OD since one month. He was scheduled for laparoscopic cholecystectomy and open epigastric hernia repair.

During pre-anaesthetic evaluation,

Anticholine-esterase antibodies value was 10.24 mcg/dl (Normal: 0.2-0.4mcg/dl). Edrophonium test was positive. Routine laboratory tests, Thyroid function tests were normal. BSL Fast & PP-within normal limits. Echo report – EF-55%, rest was within normal limits. Platelet count was 2.38 lakhs /cu mm. PT: 12.7 sec; INR: 0.92 sec. Pulmonary function tests after 4 hrs of pyridostigmine were normal. ECG showed LAD, ST depression in V1-V2, progression of R waves in v4-v6.

Pre-operative management -

Clopidogrel stopped 5 days prior to surgery and oral hypoglycemic agents 48 hrs prior to surgery. Patient was put on 6U-6U-6U regular insulin as per BSL reports. On the day of surgery morning dose of Pyridostigmine was omitted .

Patient was accepted for surgery under ASA grade II (high risk).

Before surgery -

Two IV lines were secured with 18G cannula & central venous catheter was inserted in rt. Internal jugular vein. Pre-operative BSL was 112mg/dl. IV 5% dextrose infusion started at the rate 125 ml/hr/70 kg body weight at 6 am in the morning. Inj. regular insulin 3U s/c was given. Infusion of 5% dextrose continued throughout the surgery. Second IV line was used for non glucose containing solutions. Patient was shifted to O.T. and ECG, NIBP, ETCO2, pulse oximeter monitors were attached . Premedicated with Inj. Fentanyl 2 mcg/kg, Inj. Ranitidine 50 mg , Inj. Midazolam 1.5mg , Inj. Ondansetron 4mg IV.

After pre-oxygenation pt. was induced with Inj. Propofol 2mg/kg & Intubated with Inj. Rocuronium 0.04 mg/kg & No 8.5 cuffed portex ETT. He was maintained with O2 and N2O (40:60) & Sevoflurane.

HR, ECG, NIBP, SpO2, ETCO2, temperature, CVP, BSL at 30 mins interval, blood loss, urine output & neuromuscular block were monitored throughout the surgery. The surgery lasted for approximately 110 min. No further dose of Rocuronium was required. Patient was haemodynamically stable throughout the surgery.

Besides Fentanyl, analgesia was augmented with Acetaminophen suppositories 975 mg (Anamol supp.) before surgical incision. Patient was given 75 mg intramuscular Diclofenac sodium during the surgery. Postoperatively IV Paracetamol 1000mg infusion over 20 min 8 hrly was used.

On completion of surgery, recovery from neuromuscular blockade was assessed. Pt was reversed with Inj. Neostigmine 0.02 mg/kg + Inj. Glycopyrrolate 10 mcg/kg. Extubation criteria were assessed and patient extubated.

After 2-3 mins of extubation, patient suddenly developed ventricular ectopic beats and severe hypotension. Soon after that the ectopics turned into ventricular tachycardia and patient became unconscious. Defibrillation was done with 300 J biphasic stimuli and IV Inj. Lidocaine 1.5 mg/kg (120 mg) was given.

Patient was re-intubated and kept on IPPV with 100% 02 for approximately 30 mins. and shifted to HDU where he was kept on IPPV mode of ventilation with FIO2 0.5 & IV Lidocaine infusion continued at 1 mg/min. The patient stabilized after 4 hours. He was shifted to SIMV mode of ventillation. After about ½ hour , patient again developed a second attack of ventricular tachycardia. Bolus of Inj. Amiodarone 300 mg IV given and infusion continued at 2 mg/kg/hr over 8 hours. Ventilation was changed to IPPV mode with Fentanyl –Propofol infusion.

CVP, ABG, BSL, SPO2, NIBP, ECG & neuromuscular monitoring was done in the post operative period in HDU.

Elective ventilation continued overnight and patient was extubated next morning after assertening standard criteria for extubation. Tab Pyridostigmine was given through Ryles tube in post operative period, Inj. Dexamethasone 8 mg, IV 8 hourly was given for 3 days. Inj. Insulin continued according to BSL reports. Remaining postoperative period was uneventful. Patient was shifted to surgery ward from HDU on 4th postoperative day. At follow up visit 6 weeks later—patient had no complaints and all laboratory reports were normal.

DISCUSSION

Myasthenia gravis is a disease of great significance to the anesthesiologist as it affects the neuromuscular junction and commonly presents with fatigability of skeletal muscles, most commonly eyelids and extra ocular muscles which manifest as difficulty in chewing and swallowing.

Surgery and anaesthesia in Myaesthenic patients are associated with severe complications and increased risk of death. The risk is mainly related to a markedly higher sensitivity to muscle relaxants observed in this

group of patients, even in periods of complete remission.[6] Myasthenia gravis patients often require prolonged ventilation in the ICU setting.[7,8,9]

The use of muscle relaxants in patients with Myasthenia gravis has been a controversial topic. It is difficult to determine the optimal amount of muscle relaxants required in a patient with Myasthenia gravis.[10] Generally, non-depolarising agents are avoided in Myasthenia gravis cases as they increase sensitivity to these drugs. Hence, there is an increasing trend of using non-muscle relaxant techniques in such patients who undergo surgery.[11]

Commonly, there are 2 approaches to administer general anaesthesia to patient with myasthenia gravis-

i) With non-depolarising muscle relaxants.

ii) Without non-depolarizing muscle relaxants.

The use of a Fentanyl-Propofol combination, Fentanyl-Sevoflurane combination, has been reported in the literature.[11] Some studies have also reported the use of epidural in combination with techniques of general anaesthesia.

In our case, we used classical "non tight control regime for management of diabetes. We used short acting non-depolarising muscle relaxant Rocuronium. Loading dose was adjusted according to the peripheral nerve stimulator study (presence of Fade T4/T1 <0.7) because patient was posted for laparoscopic upper abdominal surgery which requires good muscle relaxation. Sevoflurane was used as our patient was asthmatic and a known case of Ischemic heart disease, and Sevoflurane being less irritant to airway and cardio stable with less hemodynamic changes was well tolerated by patient.[12,13,14]

Generally, epidural catheter for pain control is more helpful in abdominal surgery. In our case, however, epidural analgesia was not used. Instead, we opted for a multimodal approach for intraoperative & postoperative analgesia. We used suppositories of Acetaminophen, intravenous Diclofenac sodium & Paracetamol.

Previously, there are several reports to predict the postoperative ventilation in a patient with Myasthenia gravis undergoing major surgeries. We used Osserman grading :

OSSERMAN CLASSIFICATION OF MYASTHENIA GRAVIS

class I	Ocular:	Purely ocular without generalized symptoms
class IIa	Mild:	Slow progression, drug responsive, no crisis
class IIb	Moderate:	Severe skeletal and bulbar involvement without crisis, less satisfactory drug response
class III	Severe:	Rapid progression of severe symptoms with respiratory crisis and poor drug response. High incidence of thymoma, High Mortality
class IV	Late severe:	Similar to III but more time, High Mortality

The Myasthenia Gravis Foundation of America Clinical Classification -

class I	Eye muscle weakness, possible ptosis, no other evidence of muscle weakness elsewhere
class II	Eye muscle weakness of any severity, mild weakness of other muscles
class IIa	Predominantly limb or axial muscles
class IIb	Predominantly bulbar and/or respiratory muscles
class III	Eye muscle weakness of any severity, moderate weakness of other muscles
Class IIIa	Predominantly limb or axial muscles
Class IIIb	Predominantly bulbar and/or respiratory muscles
Class IV	Eye muscle weakness of any severity, severe weakness of other muscles
Class IVa	Predominantly limb or axial muscles
Class IVb	Predominantly bulbar and/or respiratory muscles (Can also include feeding tube without intubation)
Class V	Intubation needed to maintain airway.

Based on the preoperative evaluation of our patient (Osserman grade II A) & surgical procedure, residual anaesthetic effects were carefully assessed and planned extubation was carried out after reversal with Inj. Neostigmine and Inj. Glycopyrrolate.

Neuromuscular disease causes a lot of anaesthesia related problems. The most important being an expected adverse reaction to anaesthetics and/or muscle relaxants even leading to a life threatening incidence. Cardiomyopathy is a common feature in many neuromuscular disorders and all cardiac depressants are to be avoided[15]. There is evidence suggesting chance of cardiac dysrhythmias in patients with ASA grade II, III with cardiac disease undergoing laparoscopic surgery due to pneumoperitoneum.[16] The individual risk of every patient has to be evaluated carefully before anaesthesia.

In our available setup, we successfully managed a known case of Myasthenia gravis with Ischemic heart disease, Bronchial asthma & Type II Diabetes undergoing laparoscopic cholecystectomy with epigastric hernia repair who developed cardiac dysrhythmias postoperatively with multiple causes.

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