Case Report

Enhanced recovery after surgery with intrathecal opioid in a patient of Gilbert's syndrome undergoing mitral valve replacement

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ABSTRACT

Gilbert's syndrome, an inherited autosomal dominant disorder, is the most common cause of congenital unconjugated hyperbilirubinaemia. We report the anaesthetic management of a 46-year-old female with Gilbert's syndrome operated for mitral valve replacement (MVR), with a special focus on the role of intrathecal opioids.

Key words: Cardiac surgery, cardiopulmonary bypass, Gilbert's syndrome, intrathecal opioid

INTRODUCTION

Gilbert's syndrome, an inherited autosomal dominant disorder, is caused by the relative deficiency of glucuronyl transferase enzyme responsible for conjugation of bilirubin. It is the most common cause of congenital unconjugated hyperbilirubinaemia.[1] Preoperative bilirubin level is a risk factor for mortality after cardiac surgery and stress due to fasting, anaesthesia, surgery, and cardiopulmonary bypass (CPB) cause exacerbation of hyperbilirubinaemia.[2,3] Single preoperative administration of intrathecal opioids decreases pain and perioperative opioid requirements and hastens recovery in patients undergoing cardiac surgery. Written and informed consent has been obtained from patient to report this case.

CASE REPORT

A 46-year-old female weighing 60 kg, a diagnosed case of Gilbert syndrome was posted for MVR. Her liver function profile [Table 1] revealed total bilirubin of 20.6 mg/dl with unconjugated bilirubin of 19.8 mg/dl. Preoperative echocardiography showed severe mitral stenosis, moderate tricuspid regurgitation (TR), moderate pulmonary hypertension with mild right ventricular (RV) dysfunction, and a left ventricular ejection fraction of 65%.

She was premedicated with oral. alprazolam 0.25 mg and fasted for 8 h but allowed clear water up to 2 hours before surgery. 5% dextrose infusion was started in the morning. Standard monitors including 5 lead electrocardiogram, invasive arterial blood pressure,

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Table 1: Laboratory investigations

Investigations	Preoperative	POD 1	POD 2	POD 3	POD 4
Haemoglobin (g/dl)	10.6	9.8	11.2	11.4	11.4
Total bilirubin (mg/dl)	20.6	13.5	20	20.5	17.8
Unconjugated bilirubin (mg/dl)	19.8	12.4	18.2	19.1	15.4
Aspartate aminotransferase (IU/L)	33	126	109	86	48
Alanine transaminase (IU/L)	22	49	54	52	47
Alkaline phosphatase (IU/L)	175	181	152	157	143
Total protein (g/dl)	7.5	5.8	6.3	6.4	6.3
Albumin (g/dl)	4.3	3.5	3.4	3.4	3.2

POD – Postoperative day

and pulse oximetry were attached to the patient before general anaesthesia (GA) induction. With patient in left lateral decubitus position under aseptic precautions, 10cc of normal saline containing 250 μg morphine and 25μg fentanyl was injected into the intrathecal space with a 26 G Quincke spinal needle in the L3-L4 intervertebral space. GA was induced with titrated doses of fentanyl and propofol intravenously (IV). Transoesophageal echocardiography (TOE) revealed a clot in left atrial appendage and dilated inferior vena. The average hepatic blood flow was estimated to be 192 ml/min before CPB.

After systemic heparinisation with 4 mg/kg of injection heparin, cannulation was performed. Proper position of IVC cannula was confirmed by TOE. Normothermic (35°C–36°C) CPB was maintained with flow of 2.2-2.5 L/min/m2, and a mean arterial pressure of 70-80 mmHg. The mitral valve was replaced with 29 mm St. Jude's mechanical valve. Total ischaemia time and CPB time were 78 and 98 min, respectively. The patient was weaned from CPB with inotropic support of inj. milrinone 0.3 μg/kg/min and noradrenaline 0.05 μg/kg/min. Post CPB TOE showed mild right ventricular dysfunction and moderate tricuspid regurgitation, normal mitral prosthetic valve function, and hepatic blood flow was 175 ml/min. The patient was extubated after 4 h of ventilation and allowed orally 2 h after extubation. Postoperative pain was managed with inj. diclofenac 50 mg twice daily (IV) and intermitted boluses of inj. fentanyl with total opioid of 130 μg over next 48 h. Patient was discharged from intensive care unit after 5 days and hospital after 8 days.

DISCUSSION

Incidence of hyperbilirubinaemia following cardiac surgery is 10–40% and is associated with mortality as high as 25%.[3] Preoperative total bilirubin concentration, the number of valves replaced, and preoperative right atrial pressure are the most important risk factors for prediction of the postoperative hyperbilirubinaemia and mortality.[3]

Our patient categorised to class B (modified Child–Pugh classification) was associated with mortality ranging from 18% to 80% while undergoing cardiac surgery.[4] We took various measures to prevent further increase in bilirubin level perioperatively. Before CPB commencement, IVC cannula position was checked by TOE to prevent further liver damage during CPB. Hepatic blood flow measurement prior to CPB and after coming off CPB gives us objective idea about any compromise in hepatic perfusion during cardiac surgery. Its feasibility has been demonstrated in cardiac as well as noncardiac surgical patients.[5,6] Hyperbilirubinaemia can occur after CPB due to haemolysis caused by cardiotomy suction, hypothermia, the membrane oxygenator, and various other elements of CPB and nonpulsatile perfusion causing hepatic ischaemia.[7-9] Similarly, blood transfusion increases bilirubin load. To prevent that, we followed CPB management goals, such as high pump flow, maintaining mean arterial pressure above 70 mmHg, normothermic bypass, and use of modified ultrafiltration. Modified ultrafiltration technique helps in maintaining hematocrit during CPB, which avoids blood transfusion further, limits hyperbilirubinaemia. Intrathecal administration of opioids significantly reduces intravenous opioids thus aids in fast tracking of patient undergoing cardiac surgery.[10] Although the onset of analgesia following intrathecal administration of fentanyl is <10 min, after morphine is >60 minutes. Duration of action of intrathecal fentanyl is 4 h, whereas morphine is >24 h. Thus, intrathecal administration of both opioids led to rapid onset of analgesia due to fentanyl and prolonged duration of action by morphine.

CONCLUSION

Enhanced recovery after surgery is feasible with the use of intrathecal opioids in patient with Gilbert's syndrome undergoing cardiac surgery.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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