Flash Pulmonary Oedema following Prostodin in Pregnancy

Wg Cdr RM Sharma*, Lt Col S Vardhan†

MJAFI 2008; 64 : 375-376

Key Words : Prostodin; Pulmonary oedema; Mitral stenosis

Introduction

Mitral stenosis is the most common valvular disorder associated with pregnancy in India [1]. During pregnancy, the increased maternal blood volume can lead to heart failure and pulmonary oedema in patients with mitral stenosis. The risk of sudden pulmonary oedema is further aggravated with use of uterotonic drugs such as prostodin. We present a case of flash pulmonary oedema following prostodin.

Case Report

A 22 year old primigravida at 38 weeks of gestation was admitted for conduct of labour and delivery. She was a diagnosed case of rheumatic heart disease with mitral stenosis. Percutaneous transvalvular mitral commissurotomy (PTMC) was done about a year back, following which her mitral valve area increased from 0.8 cm² to 1.4 cm². The course of pregnancy remained uneventful. The resting electrocardiogram was essentially normal except for T-wave inversion in anterior chest leads (V1-V3). However, the patient did not report for scheduled cardiac evaluation and was admitted with labour pains. To augment labour an oxytocin infusion (6 milli IU/min) was started. Labour analgesia by combined-spinal epidural technique was initiated. Initially 25 µg fentanyl was administered intrathecally followed by infusion of 0.1% bupivacaine and 0.0002% fentanyl @ 5ml/hour. The progress of labour was not satisfactory despite adequate uterine contractions. Because of non-progress of labour the patient was taken up for emergency caesarean delivery after eight hours of labour. The epidural catheter was found to be blocked in the operation theater, and the decision was made to administer a general anaesthetic. Anaesthesia was induced with 250 mg thiopentone and the trachea was intubated after succinylcholine following rapid sequence induction intubation technique. Anaesthesia was maintained with oxygen/nitrous oxide and vecuronium was used for maintenance of muscle relaxation. Initially her haemodynamic parameters remained stable with heart rate

75-80/min, blood pressure 110/70 mm Hg and oxygen saturation (SpO₂) 97%. After delivery of the baby five units of oxytocin was administered as a bolus followed by oxytocin infusion (started with 6 milli IU/min gradually increased to 40 milli IU/min). Despite oxytocin infusion uterus remained atonic and on the obstetrician's request prostodin (15-methyl-prostaglandin F2 α) 0.25mg was injected into the myometrium.

Within five minutes of prostodin, oxygen saturation started falling and crackles were noticed on auscultation of lungs. After ten minutes of prostodin, SpO₂ fell to 75% and bilateral extensive coarse crackles on auscultation of breath sound were heard along with pink frothy secretions in endotracheal tube. Intra-operatively only 250 ml of lactated Ringer solution was administered. In view of her underlying mitral stenosis, a diagnosis of cardiogenic pulmonary edema was made and the patient was treated with furosemide, morphine and postoperative ventilation with positive end expiratory pressure (PEEP). A chest radiograph taken immediately after surgery showed perihilar "butterfly" opacities suggestive of cardiogenic pulmonary oedema (Fig. 1). The electrocardiogram did not reveal any fresh changes. After four hours of ventilation, the patient's lungs were clinically clear, arterial blood gases were satisfactory, and trachea was extubated. A postoperative echocardiography revealed a re-stenosed valve with an area of 0.8 cm². Subsequent recovery was uneventful.

Discussion

In the past mitral stenosis was the most common rheumatic lesion associated with maternal mortality [2]. Haemodynamically, mitral stenosis is a state of fixed cardiac output caused by left atrial outflow obstruction. During the intrapartum and postpartum periods, volume status and cardiac output are critical concerns. A postpartum fluid shift increases the risk of pulmonary oedema.

Traditionally, oxytocin and ergot preparations (methyl-ergometrine and syntometrine) have been used as uterotonic agents for post-partum haemorrhage

*Classified Specialist (Anaesthesiology & Critical Care), 5 Air Force Hospital, C/o 99 APO, Pin 938205. †Classified Specialist (Obstetrics & Gynaecology), Military Hospital Jodhpur.

Fig. 1 : Chest radiograph (AP view) showing perihilar “butterfly” opacities suggestive of cardiogenic pulmonary oedema

prophylaxis mostly as part of active management of the third stage of labour. Methyl-ergometrine is a potent vasoconstrictor of uterine and systemic circulation. It causes rise in preload and afterload, should only be given with caution, if at all, in a woman with hypertension and heart disease. Oxytocin, on the other hand, when given as an acute bolus, can cause a marked reduction in blood pressure. Caution should therefore be exercised when giving oxytocin to women with cardiovascular problems, and a continuous low-dose infusion is probably preferable to bolus injection [3]. Ergot preparations seems to be somewhat more effective in reducing blood loss but are associated with a higher rate of side effects and the choice should be made according to the trade-off between the benefit and harm [4].

Prostaglandins do not cause hypertension and they have been mainly used for intractable postpartum haemorrhage as a last resort when other measures fail. However the uterotonic of choice in setting where active management is practiced is oxytocin. Intramuscular or

intra-myometrial prostaglandins are not preferable to conventional uterotonics in the routine management of the third stage of labour especially for low-risk women [5]. In a high-risk patient such as mitral stenosis intra-myometrial prostodin can cause sudden uterine contraction resulting in increased systemic blood volume and consequent pulmonary edema. Pulmonary oedema following intra-myometrial prostodin has been reported even in patients with normal heart [6]. It may be prudent to avoid intra-myometrial prostodin in these high-risk cases as far as possible. If at all prostodin is used because of persistent uterine atony, it is recommended that a diuretic should be administered before prostodin, which reduces the risk of pulmonary oedema.

Conflicts of Interest

None identified

References

1. Sawhney H, Aggarwal N, Suri V, et al. Maternal and perinatal outcome in rheumatic disease. *Int J Gynecol Obstet* 2003; 80: 9-14.
2. Silversides CK, Colman JM, Sermer M, Siu Sc. Cardiac risk in pregnant women with rheumatic mitral stenosis. *Am J Cardiol* 2003; 91: 1382-5.
3. Rogers MS, Alan MZ Chang. Postpartum hemorrhage and other problems of the third stage. In: David K James, Carl P Weiner, Philip J Steer, Bernard Gonik, editors. *High risk pregnancy: management options*. 3rd ed. Saunders An imprint of Elsevier. 2006; 1559-78.
4. Carroli G. RHL practical aspects: oxytocin or oxytocin+ergot alkaloids in active management of the third stage of labour. The WHO Reproductive Health Library. Oxford: Update Software. WHO/RHR/01.6 2001.
5. Gulmezoglu AM, Foma F, Villar J, Hofmeyr GJ. Prostaglandins for preventing post-partum haemorrhage. *Cochrane database of Syst Rev* 2007;3: CD000494. DOI: 10.1002/14651858. CD 000494. Pub 3.
6. Rodriguez dela Torre MR, Gallego Alonso JJ, Gil Fernandez M. Pulmonary edema related to administration of 15-methyl-prostaglandin F_{2α} during cesarean section. *Rev Esp Anesthesiol Reanim* 2004; 51: 104-7.

Events Calendar

October 4-7, 2009

4th International Conference on Birth Defects & Disabilities in the Developing World.

Theme: “Translating Research into Care and Prevention”.

Venue: Department of Genetic Medicine, Sir Ganga Ram Hospital, Rajender Nagar, New Delhi

Contact : Dr IC Verma

Senior Consultant and Chairman, Dept of Genetic Medicine, Sir Ganga Ram Hospital, Rajender Nagar, New Delhi, India 110060.

Telephone No: (Direct) +91-11-25861767 or +91-11-42251382,

Email: icverma@gmail.com

Website: www.icbd2009.com

October 10-12, 2008

XX National Conference of Indian Society of Pediatric Nephrology (ISPNCN 2008)

Venue: Armed Forces Medical College, Pune

Contact: Wg Cdr V Venkateshwar

Jt Organizing Secretary

Dept of Pediatrics, Armed Forces Medical College,

Pune 411040, India

Tel: Civil: 020-26306047, Mil: 6047, Mobile: 9850518142

E-mail: ispncon2008@gmail.com