

SIMULATION SKILLS TRANSLATED TO HIGH QUALITY CLINICAL ANAESTHESIA- AN EXPERIENCE

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BACKGROUND

Simulation training is rapidly becoming an integral element of the education curriculum of anaesthesia residency programs.

We report a case of successful management of a patient undergoing caesarean section under general anaesthesia. We conducted an obstetric anaesthesia workshop where in we created a similar scenario. Learning objectives were proper assessment of the patient, planning the anaesthesia, aspiration prophylaxis, proper pre-oxygenation, airway assessment and management strategy, cricoid pressure, adequate analgesia following baby delivery and administration of uterotonics and vasopressor along with fluid resuscitation. Neonatal resuscitation was also enacted during the workshop.

In a clinical setting we needed to deliver general anaesthesia for a case of caesarean section with a history of chicken pox one week before the surgery. The rashes on patients back and recent history of disease were contraindications for regional anaesthesia techniques. We were able to implement all the protocols, resuscitation measures and proper management. Upon debriefing, it was determined that the previous training influenced proper planning and management of the present case. Successful implementation of high-quality patient safety methods and delivering high quality anaesthesia was achieved by simulation training.

Simulation is a technique to amplify real patient experiences with guided, artificially contrived experiences, that evokes or replicates substantial aspects of real world in a fully interactive manner. With the introduction of The Medical Simulation laboratory about 2 years back at our institution, trainees undergo simulation-based training during their residency.

We conducted an obstetric anaesthesia workshop for the anaesthesia residents in which there was a similar case

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scenario in which general anaesthesia was given to a pregnant female for LSCS i/v/o Local skin infection at the back.

Trainees are expected to recognize the problem and plan the appropriate choice of anaesthesia, allocate roles, determine the risks involved and perioperative management of the patient.

In this way the residents are expected to use not just technical skills but also the non- technical skills which play a major role in such emergencies.

Case Report

PRESENTATION OF CASE

A 24-year-old female, 65 kg, primigravida, 37 weeks of gestation developed fetal distress and was posted for emergency lower segment caesarean section. On admission, she was febrile, pulse rate 120 beats per minute and non-invasive blood pressure 140/90 mmHg. She had lesions over face, trunks and back. Lesions first began as macules and papules, turned into pustules and presently they are crusting over since past 5 days. She has not received any treatment. On auscultation chest was clear and heart sounds were normal. Ultrasonography done which shows IUGR and oligohydramnios. Laboratory tests were done. On NST fetal movements were decreased.

CLINICAL DIAGNOSIS

Patient gives history of raised lesions over the body since past 10 days. They started over face and then spread over bilateral trunks and back. They turned into pustules. She gives history of contact with a known case of varicella zoster case in her neighbourhood. She has not received any immunization and treatment. As the patient presented with this in an emergency with fetal distress, we had to induce this case as early as possible.

DIFFERENTIAL DIAGNOSIS

- Small pox
- Dermatological manifestation of Herpes simplex
- Dermatitis Herpetiformis
- Erythema multiforme
- Syphilis
- Bullous Pemphigoid

PATHOLOGICAL DISCUSSION

- Varicella zoster virus is a DNA virus. It is highly contagious. The virus spreads through person-to-person via respiratory droplets and direct contact. Incubation period of infection is 10-14 days. The incidence of varicella in pregnancy is 1-5 per 10, 000 pregnancies. For the mother the risk of severe illness is greatest after mid pregnancy, for the fetus the risk of congenital infection is greatest in first and second trimester.
- In this case report, we presented the case of a primigravida in acute phase of infection with fetal distress, posted for emergency caesarean section. How simulation workshop helped us in key issues regarding choice of anaesthesia, pre- and post-operative care and complications are discussed.

DISCUSSION OF MANAGEMENT

As the patient came in the emergency with added infection of varicella zoster over back, spinal/epidural anaesthesia was ruled out. We decided to induce patient with general anaesthesia. Taking into consideration the physiologic changes in pregnancy and pharmacological requirement for pregnancy, safe mode of action was planned. Residents took charge of the situation under consultant's supervision. General Anaesthesia was planned with Rapid sequence induction and roles were assigned to each resident. Junior residents were instructed to take preoperative assessment and informed and written consent. All necessary drugs, anaesthesia machine and equipment were kept ready. After taking informed consent, wide-bore IV cannulation was done, and standard monitors were placed. After pre-oxygenation for 3 minutes, Rapid sequence induction was done using Inj. Glycopyrrolate 0. 2 mg IV, inj. Thiopentone till the loss of eyelash reflex. Cricoid pressure was applied lightly while giving induction agents. Inj. Succinylcholine chloride 15 mg/kg was given and after the fasciculations subsided cricoid pressure was increased to prevent aspiration and prevent gastric insufflation of stomach. Patient was intubated with 6. 5 cuffed ET tube after laryngoscopy. Cricoid pressure was applied till confirmation of endotracheal intubation and cuff inflation. Once the baby was out, Inj. Oxytocin infusion was started. Inj. Midazolam 1 mg, Fentanyl 2 mg/kg was administered.

Baby cried immediately after birth. Intraoperatively, anaesthesia was maintained with Inj. Atracurium, O₂: N₂O and Isoflurane. Surgery got over in 50 minutes. Patient was extubated and shifted to recovery room for post-operative monitoring.

All anaesthesia residents had undergone near similar situation in simulation-based exercise 6 weeks prior the described event. After the surgery during the debriefing residents stated that they were able to translate their skills learned during simulation training to real clinical situations with following steps:

- To demonstrate situation awareness;
- Anticipation and plan of general anaesthesia;
- Pre-anaesthetic assessment;

- Aspiration prophylaxis;
- Pre-operative oxygenation;
- Administration of analgesics;
- Uterotonics after baby delivery.

The efficiency and coordinated efforts of residents involved, is evidence that simulation training may be helpful in management of such scenario.

Study done by Andreatta et al done in 2011 suggested that a simulation based mock code program may significantly benefits paediatric patient CPA outcomes applied clinical outcomes not simply learner perceived value, increased confidence, or simulation-based outcomes.⁵

A relatively brief (four-hour) HPS-based curriculum can improve the teamwork and clinical performance of multidisciplinary trauma teams. This was concluded In Situ, Multidisciplinary, Simulation-based teamwork training improves early trauma care by Susan Steinemann, MD et al.⁶

Smith et al. described a case of successful resuscitation of bupivacaine-induced cardiac arrest treated with IV lipid emulsion. Where providers had recently participated in simulation training and upon debriefing it was determined that the previous training influenced execution of correct steps of resuscitation.

FINAL DIAGNOSIS

This was a case of a primigravida presenting with fetal distress and an added infection of varicella zoster.

Conclusion

The varicella zoster lesions over the back ruled out spinal/epidural anaesthesia. A quick decision had to be made to take the case under general anaesthesia. This decision was easy to make and execute because the residents had been previously exposed to a near similar situation in simulation lab. This case report is the evidence that simulation training may be helpful in the management of rare emergencies.

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