

Anaesthetic management of obstetric emergencies

Address for correspondence:

Dr. Pradeep A Dongare,
Department of Anaesthesia,
ESICMC-PGIMSR,
Bengaluru, Karnataka, India.
E-mail: pradeep.dongare@gmail.com

Pradeep A Dongare, Madagondapalli S Nataraj

Department of Anaesthesia, ESICMC-PGIMSR, Bengaluru, Karnataka, India

ABSTRACT

Obstetric emergencies are a challenge both for the obstetrician and the anaesthesiologist. The incidence of caesarean sections as per the National Family Health Survey published in 2015–16 was 17.2%. In 7.6% of cases, the decision to conduct a caesarean section was taken after the onset of labour pains. Caesarean sections are classified depending on the urgency into four categories. The target decision to delivery interval for category 1 caesarean section is less than 30 min. This is used as an audit tool for the efficiency of an obstetric service. The management of these emergencies involves a rapid assessment, with minimal investigations. Although general anaesthesia is considered to have higher morbidity and mortality, category 1 caesarean sections may still warrant this technique. Rapid sequence spinal anaesthesia is replacing general anaesthesia for many of the category 1 indications. In category 2 and 3 caesarean sections, spinal anaesthesia still remains the technique of choice. Failed intubation, failed neuraxial block, extensive neuraxial block, awareness under anaesthesia, thromboembolism, amniotic fluid embolism, haemorrhage and maternal collapse are some of the complications. Haemorrhage is said to be the leading cause of mortality worldwide.

Key words: Anaesthesia, caesarean, emergencies, obstetric

Access this article online

Website: www.ijaweb.org

DOI: 10.4103/ija.IJA_590_18

Quick response code


INTRODUCTION

The incidence of caesarean deliveries in India as per the National Family Health Survey report was 17.2%. Of all deliveries, in 7.6% of cases, the decision to conduct caesarean section was taken after the onset of labour pains. This gives us an indirect indicator of caesarean sections performed for emergent indications.^[1] Emergency anaesthesia has high maternal and child morbidity and mortality. Improving anaesthetic care is one of the key areas of action in the MBRRACE – UK Maternal report 2017.^[2] Formerly, caesarean deliveries were categorised as elective and emergency. The problem with this classification was that all non elective cases were categorised as emergencies irrespective of their nature of urgency. Rout *et al.* in the year 1997 described the indications for emergency caesarean section depending on the available time to delivery [Table 1] and classified them as emergencies, urgent and planned emergencies.^[3] From this classification a rational decision on the technique of anaesthesia to be employed was described [Table 2]. A classification

of the urgency of caesarean delivery was developed by Lucas in 2000.^[4] It was based on a four scale category of urgency [Table 3]. This new classification was introduced in the 2004 edition of National Institute for Health and Care Excellence (NICE) guidelines.^[5] The NICE, established in 1999, is part of the National Health Service that aims at improving the quality and safety of medical care through standardisation of medical treatment by providing guidelines from scientific evidence and economic evaluation. We used the search words obstetric emergencies, decision to delivery interval (DDI), category 1 caesarean section, anaesthetic complications of caesarean section, amniotic fluid embolism in PUBMED, Google Scholar and EMBASE databases to access articles pertaining to this topic.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Dongare PA, Nataraj MS. Anaesthetic management of obstetric emergencies. Indian J Anaesth 2018;62:704-9.

DECISION-TO-DELIVERY INTERVAL FOR CAESAREAN SECTION

The earliest guidelines for DDI in caesarean section were put forth by ‘Organizational Standards for Maternity Service’ published by the Royal College of Obstetricians and Gynaecologists in 1995. It stated that the decision-to-delivery interval for category 1 caesarean section should be less than 30 min. Although this rule has not been validated, it is generally accepted that the neonates should be delivered within 30 min following the decision to deliver to have a better outcome.^[6] This timeline of 30 min is used as an audit tool rather than an objective guide. Of these 30 min, 5 min are for transporting the patient to the theatre, 5 min for draping and painting and the rest of the time for anaesthesia and delivery. The available time for anaesthesia determines the technique of anaesthesia used [Table 2].^[7]

A DDI of 30–75 min is described for category 2 caesarean sections by some authors.^[8]

The factors that can affect DDI can be divided according to the competence and responsibility of people involved

in the functioning of the obstetrics department. Obstetrician-dependant factors include appropriate diagnosis of indications for caesarean section and proficiency during the procedure (incision-to-delivery interval). Midwives are responsible for preparation of the patient and the operating theatre as well as transport of the patient. Anaesthesiologists deem patients eligible for anaesthesia and are also responsible for efficiency of its administration. Furthermore, few additional factors namely sufficient number of qualified staff, regular training in emergency procedures, availability of operating theatres, as well as fast and safe transportation of patients between the admission room, obstetrics department and operating theatres also influence the DDI.

ASSESSMENT

The pre-anaesthetic evaluation of a parturient coming for emergency caesarean section should include a rapid assessment to determine the risk of difficult airway, obstetric haemorrhage and risk of aspiration. The preoperative investigations required are complete blood count, blood grouping and cross matching and if absolutely necessary renal function, liver function tests and coagulation profile. These investigations should be ordered and the administration of anaesthesia continued.^[9]

PREOPERATIVE PREPARATION

All patients coming for a caesarean section need to be prepared for general anaesthesia and measures to prevent haemorrhage have to be taken. Preoperative preparation includes in utero resuscitation of the foetus [Table 4], administration of acid aspiration prophylaxis, preparing for a potential difficult airway, securing intravenous access (should have a 2nd IV access ready), prepare for prevention of haemorrhage and invasive monitoring if required and if time permits, especially in category 1 caesarean sections.^[9] All mothers coming for emergency caesarean sections are at high risk of aspiration, especially as recent

Emergency within 15-20 min	Urgent	Planned emergencies
Foetal distress	Meconium stained liquor	Pregnancy induced hypertension
Abruption placentae with viable foetus	Unfavourable foetal heart rate	Planned elective caesarean section in labour
Scar dehiscence	Obstructed labour	
Uterine rupture		
Placenta praevia		
Cord prolapse		
Delivery of second twin		

Time available (min)	Technique of choice
5-10	General anaesthesia
10-15	Spinal anaesthesia, general anaesthesia
>20	Existing epidural, spinal anaesthesia, general anaesthesia

Category	Definition	Indications
1	Immediate threat to life of mother or foetus	Placental abruption, uterine rupture, active bleeding, severe foetal distress and cord prolapse
2	Maternal or foetal compromise that is not immediately life threatening	Breech presentation, previous caesarean section and non-reassuring foetal status
3	No maternal or foetal compromise but needs early deliver	Low AFI and previous caesarean section not in labour
4	At a time to suit the mother and the maternity team	

AFI – Amniotic fluid index

Table 4: *In utero* foetal resuscitation

Oxytocin off
Position full left lateral
Oxygen
Intravenous crystalloids
Intravenous vasopressor if blood pressure is low
Tocolysis: terbutaline 250 µg (s.c), glyceryl trinitrite 400 µg (metered aerosol doses)

guidelines advocate that mothers consume solids and liquids during normal labour. Oral sodium citrate, ranitidine and metoclopramide IV can be used as acid aspiration prophylaxis. Sodium citrate 30 ml 0.3 M is to be administered at least 20 min before induction of general anaesthesia. Studies advocate that it can be administered just before shifting to the operation theatre. There is an increase in the gastric volume, but the pH is also increased. The other disadvantage with sodium citrate is the high incidence of nausea and vomiting. Hence, it is not advised in patients receiving regional anaesthesia.^[10,11]

ANAESTHESIA FOR CATEGORY 1 CAESAREAN DELIVERY

Modes of anaesthesia

Rapid sequence induction of general anaesthesia is the choice in category 1 caesarean section unless general anaesthesia is contraindicated. In such situations, spinal anaesthesia and epidural anaesthesia (especially if epidural has already instituted for labour) may be considered. Rarely, local infiltration and caesarean section may also need to be considered.

General anaesthesia

Rapid delivery of the foetus is the goal in category 1 caesarean delivery when there is threat to life of mother or foetus. The time taken to achieve surgical anaesthesia should be kept as short as possible. Although regional anaesthesia has been advocated in well trained hands, general anaesthesia remains the technique of choice for such deliveries.

The role of anaesthesiologists starts from the time of decision to deliver by caesarean section is made. It includes maternal stabilisation and *in utero* foetal resuscitation as described in Table 4. With the declining trend towards selecting general anaesthesia for category 1 cases, there is an increased likelihood that a trainee's first experience of caesarean section under general anaesthesia will be an emergency case.^[12] Hence, best practice demands competency-based training and assessment of anaesthesiologists covering obstetric

units. Certain special considerations are to be kept in mind to conduct safe general anaesthesia in challenging circumstances.

Prophylaxis against acid aspiration

All parturients are considered to be at high risk for aspiration due to a relaxed oesophageal sphincter caused by progesterone, prolonged gastric emptying time and pressure of gravid uterus on the diaphragm. H₂ receptor antagonists (Ranitidine 50 mg intravenously) or proton-pump inhibitors (e.g., pantoprazole 40 mg intravenously) and prokinetic agents such as metaclopramide 10 mg intravenously are routinely used to reduce acid aspiration and the subsequent risk of chemical pneumonitis. Sodium citrate is also preferred because of its advantage of instantaneous action.

Patient position

To prevent neonatal depression, induction of anaesthesia is usually carried out after the patient is catheterised, the abdomen is draped and surgeons scrubbed. Left lateral tilt is recommended to avoid aorto-caval compression. A 30° head-up tilt is preferred as it is found to be useful in improving maternal well-being through an increased functional residual capacity (FRC), reduced breast interference to intubation and reduced gastro-oesophageal reflux.^[13]

Preoxygenation

As FRC is reduced by 40% at term gestation and oxygen consumption is increased by 20%, oxygen reserves get rapidly depleted.^[14] This warrants pre-oxygenation with 100% oxygen using a tight-fitting face mask that can be achieved by tidal volume breathing for 3 min or performing 4 to 8 vital capacity breaths.

Intravenous induction agents

Rapid-sequence technique is preferred for induction of general anaesthesia. Thiopentone (5 mg/kg of lean body weight) and succinylcholine 1.5 mg/kg are currently the agents of choice. Recently, researchers have suggested that rocuronium–sugammadex combination may replace succinylcholine in the near future.^[15] Propofol is generally not preferred in obstetrics due to associated poorer neonatal profile, shorter duration of amnesia potentially leading to awareness and longer time to recovery of spontaneous ventilation.^[16] Other drugs that can be used in pregnancy are etomidate and ketamine.

Cricoid pressure

Ideally cricoid pressure of 10 N should be applied on the cricoid cartilage towards the body of C6 vertebra,

and the pressure should be directed perpendicular to the tilted table. The pressure is increased to 20 to 40 N after induction and kept in place until tracheal intubation with ET CO_2 is confirmed and till the cuff of the tracheal tube is inflated.^[16]

Opioids

Due to placental transfer of the drug and known incidence of low APGAR in neonates, opioids are usually avoided in obstetric cases till the extraction of foetus. To suppress the laryngeal reflexes during laryngoscopy, non-opioid drugs such as esmolol, nitroglycerine and magnesium sulphate can be used. However, in pregnancies complicated by severe cardiac disease or hypertensive disorders, ultra-short-acting opioids such as remifentanyl or fentanyl can be used, provided this information is passed onto attending neonatologist.^[17]

Supraglottic airway devices for general anaesthesia in obstetric patients

Supraglottic airway devices are rescue devices that can be used to maintain oxygenation in women with difficult mask ventilation as well as in those with difficult intubation.^[18] Second generation supraglottic airway devices hold great potential in the management of the obstetric airway. The LMA Proseal™ incorporates a second tube intended to permit continuity with the gastrointestinal tract and isolation from the airway, minimizing gastric insufflations during positive-pressure ventilation.

Perioperative care

Minimum monitoring standards as recommended by American Society of Anesthesiologists is advised during general anaesthesia in obstetric patients. Monitoring of end-tidal carbon dioxide (ET CO_2) is found to be beneficial in preventing oesophageal intubation and endobronchial intubation. Anaesthesia is generally maintained with inhalation agents such as isoflurane and sevoflurane. Halothane is usually avoided because of its uterine-relaxant effect. Nitrous oxide is preferred by some because of its rapid onset and intra-operative analgesia. End-tidal agent monitoring can be used to titrate the anaesthetic depth. The Fi O_2 level is guided by the underlying maternal and foetal conditions.

Extubation

Given the risk of aspiration in unprotected airway, it is advised that the parturient is fully awake, with adequate reversal of residual neuromuscular block and pain free before considering for extubation.

Given the anatomical and physiological changes in pregnancy, the risk of cannot intubate cannot ventilate situation is a major disadvantage of general anaesthesia. The risk of failed intubation in pregnancy is at least 8 times higher than the general population.^[18,19]

Top-up of epidural

It is advocated that women should be persuaded to have an epidural early in labour. This reduces the incidence of general anaesthesia (if emergency caesarean is required) in the parturient by 75%.^[7] With a well functioning epidural catheter, top-up technique has shown that decision to delivery time is as fast as that for general anaesthesia. As the speed of onset is important in top-up technique, the choice of local anaesthetic and the adjuvant used plays an important role. Commonly used local anaesthetics are 2% lignocaine, 2-chloroprocaine or 0.75% ropivacaine, with or without additives for epidural top-ups. For a successful block, it is important to inject the epidural top-up solution as early as possible after the decision of emergency caesarean section has been made. Injecting the top-up solution in labour room and commencement of monitoring before shifting the parturient to operating room avoids the delay in the onset of action of the local anaesthetic.^[20] Sometimes top-up technique leads to inadequate block for emergency caesarean section, leading to patient discomfort, pain and need to convert to general anaesthesia. If the efficacy of epidural analgesia during labour is poor, consider converting to spinal or general anaesthesia. When converting partially acting epidurals to spinal, the risk of high spinal exits, and the anaesthesiologist has to be aware of it.^[21]

Rapid sequence spinal anaesthesia

In skilled hands, spinal anaesthesia can be as rapid as general anaesthesia with low failure rate and has to be considered in emergency caesarean section.^[22] Currently, the emphasis is on 'Rapid Sequence Spinal Anaesthesia', where the term 'rapid sequence' is used to emphasise the idea of performing spinal with bare essentials and limiting the number of attempts at insertion.^[23] Parturients are informed that general anaesthesia will be used if there are any delays in establishing adequate surgical anaesthesia with the spinal technique. The drug of choice will be 0.5% bupivacaine heavy, 2 chloroprocaine, 0.75% ropivacaine or levobupivacaine. Addition of an adjuvant such as lipophilic opioid fentanyl will shorten the time of

onset of the block.^[24] The umbilical artery pH of the neonates is about the same when the caesarean is performed under general anaesthesia, but umbilical arterial cord base excess has been shown to be less negative when regional anaesthesia has been used.^[25]

The sequence in a 'Rapid Sequence Spinal' are as follows:^[23]

1. Deploy other staff to secure the intravenous line
2. Preoxygenate during the attempt
3. 'No Touch Technique' use only gloves, chlorhexidine on swab to paint and use glove packet as sterile surface
4. Local injection not mandatory
5. Add 25 mcg fentanyl, if there is time. If not consider increasing the dose of bupivacaine
6. Only one attempt at spinal unless obvious correction allows a successful second attempt
7. Start surgery once sensory level >T10 and ascending. Be ready for general anaesthesia and inform the mother.

Category 2 and 3 caesarean sections

It has been advocated that in category 2 caesarean sections, the DDI is maintained at 30–75 min. Although general anaesthesia may be considered, it is not the technique of choice. General anaesthesia has been known to increase the morbidity and mortality in mothers by as much as 16 fold. The complications that can occur with general anaesthesia (pulmonary aspiration, unanticipated difficult airway) in comparison to manageable complications of spinal or epidural anaesthesia make it the last technique of choice.^[8]

Complications of emergency caesarean sections

Subsequent to the NICE guidelines many studies have been conducted to know the effect of the DDI times on maternal and foetal outcome. Most of these studies have found an improved foetal outcome with no change in the rate of maternal complications.^[26]

The most common complications in emergency caesarean sections are mentioned in Table 5. Failed intubation and pulmonary aspiration which are more commonly encountered during emergency situations have been dealt with in this article.

Failed intubation

The incidence of failed intubation is 10 times more in the obstetric population. This incidence further increases if the parturient is obese. The reasons for increased risk of failed intubation are increased fatty

Table 5: Complications of caesarean section

Surgical	Anaesthetic
Haemorrhage	Failed intubation
Thromboembolism	Pulmonary aspiration
Delayed extraction and risk to foetus	Failed neuraxial block
Amniotic fluid embolism	Allergic reactions
Maternal collapse	Awareness during anaesthesia
	Extensive spinal anaesthesia

tissue, increased oedema of pharyngeal and laryngeal tissue, complete dentition, large tongue and large breasts. The present day practice of choosing spinal anaesthesia over general anaesthesia in parturients may reduce the man-hour experience in young trainees and contribute further to the incidence of failed intubation. The main motive while facing a failed intubation is to maintain oxygenation. The failed intubation drill has to be practiced regularly.^[16] The 2015 Difficult Airway Society^[27] and 2016 All India Difficult Airway Association guidelines^[28] advocate the change of blade or change to a video laryngoscope if the first attempt to intubation is unsuccessful. A second failed attempt should pre-empt the use of other oxygenation measures like the use of a supraglottic airway device. In emergent caesareans, the surgery can be continued if oxygenation can be maintained. In situations where oxygenation cannot be maintained emergency front of neck access needs to be established. In these situations, the mother's life takes precedence over trying to save the foetus.^[27,28]

Pulmonary aspiration

Pulmonary aspiration in pregnant women is mainly due to the effect of progesterone on the lower oesophageal sphincter tone and the mechanical displacement of the stomach upwards by the gravid uterus, reducing the angle between the stomach and the oesophagus.^[29] The incidence of aspiration in caesarean sections under general anaesthesia is around 1 in 400–600. Aspiration can lead to inability to visualise the larynx during intubation, obstruction to ventilation and acid aspiration syndrome. The treatment of aspiration involves supportive measures and oxygenation. Measures to prevent aspiration include anti-aspiration prophylaxis, antiemetics, head up tilt and rapid sequence intubation.

SUMMARY

Management of category 1 caesarean sections remains a challenge. Although rapid sequence spinal anaesthesia is an alternative, general anaesthesia still remains the preferred technique. Rapid assessment, team effort and intervention by an experienced obstetrician

and anaesthesiologist can reduce the morbidity and mortality associated with category 1 caesarean sections.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- International Institute for Population Sciences (IIPS) and ICF National Family Health Survey (NFHS-4), 2015-16. India. Mumbai: IIPS; 2017.
- Draper ES, Gallimore ID, Kurinczuk JJ, Smith PW, Boby T, Smith LK, Manktelow BN, On behalf of the MBRRACE-UK Collaboration. MBRRACE-UK perinatal mortality surveillance report, UK perinatal deaths for births from January to December 2016. Leicester: The Infant Mortality and Morbidity Studies, Department of Health Sciences, University of Leicester.
- Rout CC (1997) Emergency general anaesthesia. In: Russell IF, Lyons G, editors. Clinical Problems in Obstetric Anaesthesia. London: Chapman & Hall; 2018. p. 161-77.
- Lucas DN, Yentis SM, Kinsella SM, Holdcroft A, May AE, Wee M, *et al.* Urgency of caesarean section: A new classification. *J R Soc Med* 2000;93:346-50.
- Wee MY, Brown H, Reynolds F. The national institute of clinical excellence (NICE) guidelines for caesarean sections: Implications for the anaesthetist. *Int J Obstet Anesth* 2005;14:147-58.
- Hillemanns P, Strauss A, Hasbargen U, Schulze A, Genzel-Boroviczeny O, Weninger E, *et al.* Crash emergency cesarean section: Decision-to-delivery interval under 30 min and its effect on apgar and umbilical artery pH. *Arch Gynecol Obstet* 2005;273:161-5.
- Lyons G. Anaesthetic management of obstetric emergencies. In: Gullo A. editor. *Anesthesia, Pain, Intensive Care and Emergency Medicine – A.P.I.C.E.* Milano: Springer; 2000. p. 265-70.
- Sumikura H. Anesthetic management of urgent cesarean section. *Hypertens Res Pregnancy* 2016;4:1-5.
- Lie SA, Mok MU. Peri-operative management of caesarean section for the occasional obstetric anaesthetist – An aide memoire. *Proc Singapore Healthc* 2017;26:180-8.
- Smith I, Kranke P, Murat I, Smith A, O'Sullivan G, Søreide E, *et al.* Perioperative fasting in adults and children: Guidelines from the European Society of Anaesthesiology. *Eur J Anaesthesiol* 2011;28:556-69.
- Lim SK, Elegbe EO. The use of single dose of sodium citrate as a prophylaxis against acid aspiration syndrome in obstetric patients undergoing caesarean section. *Med J Malaysia* 1991;46:349-55.
- Munnur U, de Boisblanc B, Suresh MS. Airway problems in pregnancy. *Crit Care Med* 2005;33:S259-68.
- Sharp LM, Levy DM. Rapid sequence induction in obstetrics revisited. *Curr Opin Anaesthesiol* 2009;22:357-61.
- Yeoh SB, Leong SB, Heng AS. Anaesthesia for lower-segment caesarean section: Changing perspectives. *Indian J Anaesth* 2010;54:409-14.
- Kundra P, Veena P. General endotracheal anaesthesia for lower-segment caesarean section: A vanishing art? *OA Anaesth* 2013;1:7.
- McGlennan A, Mustafa A. General anaesthesia for caesarean section. Continuing education in anaesthesia. *Crit Care Pain* 2009;9:148-51.
- Ngan Kee WD, Khaw KS, Ma KC, Wong AS, Lee BB, Ng FF, *et al.* Maternal and neonatal effects of remifentanyl at induction of general anesthesia for cesarean delivery: A randomized, double-blind, controlled trial. *Anesthesiology* 2006;104:14-20.
- Munnur U, Suresh MS. Airway problems in pregnancy. *Crit Care Clin* 2004;20:617-42.
- Hawkins JL. Anesthesia-related maternal mortality. *Clin Obstet Gynecol* 2003;46:679-87.
- Regan KJ, O'Sullivan G. The extension of epidural blockade for emergency caesarean section: A survey of current UK practice. *Anaesthesia* 2008;63:136-42.
- Gupta A, Enlund G, Bengtsson M, Sjöberg F. Spinal anaesthesia for caesarean section following epidural analgesia in labour: A relative contraindication. *Int J Obstet Anesth* 1994;3:153-6.
- Popham P, Buettner A, Mendola M. Anaesthesia for emergency caesarean section, 2000-2004, at the Royal Women's Hospital, Melbourne. *Anaesth Intensive Care* 2007;35:74-9.
- Scrutton M, Kinsella M. Obstetrics. In: Allman KG, McIndoe AK, Wilson IH, editors. *Emergencies in Anaesthesia*. 2nd ed. Oxford: Oxford University Press; 2009. p. 145-78.
- Jain K, Grover VK, Mahajan R, Batra YK. Effect of varying doses of fentanyl with low dose spinal bupivacaine for caesarean delivery in patients with pregnancy-induced hypertension. *Int J Obstet Anesth* 2004;13:215-20.
- Holcroft CJ, Graham EM, Aina-Mumuney A, Rai KK, Henderson JL, Penning DH, *et al.* Cord gas analysis, decision-to-delivery interval, and the 30-minute rule for emergency cesareans. *J Perinatol* 2005;25:229-35.
- Weiner E, Bar J, Fainstein N, Ben-Haroush A, Sadan O, Golan A, *et al.* The effect of a program to shorten the decision-to-delivery interval for emergent cesarean section on maternal and neonatal outcome. *Am J Obstet Gynecol* 2014;210:224.e1-6.
- Mushambi MC, Kinsella SM, Popat M, Swales H, Ramaswamy KK, Winton AL, *et al.* Obstetric anaesthetists' association and difficult airway society guidelines for the management of difficult and failed tracheal intubation in obstetrics. *Anaesthesia* 2015;70:1286-306.
- Ramkumar V, Dinesh E, Shetty SR, Shah A, Kundra P, Das S, *et al.* All India difficult airway association 2016 guidelines for the management of unanticipated difficult tracheal intubation in obstetrics. *Indian J Anaesth* 2016;60:899-905.
- Robinson M, Davidson A. Aspiration under anaesthesia: Risk assessment and decision-making. *Contin Educ Anaesth Crit Care Pain* 2014;14:171-5.

REGISTER TO RECEIVE THE PRINT ISSUES (HARD COPY) OF THE IJA FOR THE YEAR 2019 (JANUARY TO DECEMBER)

Online registration is open from August 1, 2018 to September 30, 2018

- Registration is FREE but MANDATORY
- This must be done even if you have been receiving print issues previously
- IJA Renewal can be only be done Online through www.isaweb.in
- Registration via email to the Editor is not possible
- Go to www.isaweb.in and Locate the Indian Journal of Anaesthesia icon