

Caesarean section anaesthesia: technique and failure rate over a 10-year period – what has changed?

It is well established that regional anaesthesia for caesarean section has significant safety benefits for women compared to general anaesthesia.¹ The Royal College of Anaesthetists (RCoA) have recommended standards for rates of regional anaesthesia in elective (> 95%) and emergency (> 85%) caesarean sections, as well as rates for conversion from regional to general anaesthesia of < 1% in elective and < 3% in emergency cases.² In the current climate and with the concerns surrounding COVID-19, the avoidance of general anaesthesia wherever possible is important as the risk of aerosol generation is reduced.³

Leicester General Hospital (LGH) in the United Kingdom manages over 4 500 deliveries annually and 1 600 caesarean sections in an ethnically very diverse population. Audits performed ten years previously showed that whilst we were able to meet standards for elective and emergency caesarean sections, we consistently failed to meet standards for conversion.³

This audit compared our performance in these standards over two five-year periods, 2005–09 and 2015–19. Retrospective data was collected via Euroking E3 database for 2018–19, and from historical audits for 2005–09⁴ and 2015–17 data, which also used our electronic database. Since 2015, LGH has been meeting all RCoA standards for regional anaesthesia and conversion from regional to general anaesthesia in elective and emergency caesarean sections. So what has changed over the past fifteen years locally to cause this improvement?

Consultant presence in cases of conversion during elective and emergency sections has been consistent between 2015–19. In 2019, 35 cases of conversion from regional to general anaesthesia were documented, of which four occurred during elective procedures; a consultant was present at three of these events. In the remaining 31 cases, which were emergencies, consultant presence was 45%.

The most notable change between the two audit periods has been in the anaesthetic staffing of the out-of-hours rota. Whereas previously core level trainees with at least one year's experience in anaesthesia performed this on call work, these commitments are now undertaken by specialty doctors, who generally have many more years of anaesthetic experience. Junior trainees below specialist registrar (ST3) level, now only undertake out-of-hours work during daylight hours and only after completion of the Initial Assessment of Competence in Obstetric Anaesthesia as required by the RCoA. All out-of-hours obstetric work for every grade of staff is supported by an experienced specialty doctor or specialty registrar who is immediately available, and a named non-resident consultant anaesthetist.⁵ This change to the use of more experienced anaesthetic doctors on call is likely to have been the main contributor to our reduction in conversion rates. This is not to say that we feel junior trainees should not have the opportunity to work on-call commitments, but they and the patient will benefit from close supervision by a senior.

However, it is difficult to generalise these results globally as we are aware that the availability of specialty doctors is not a luxury afforded to many of our colleagues in low-middle income countries (LMIC). Additionally, the techniques used in regional anaesthesia for caesarean section are variable worldwide, so equivalent grades of trainees in high-income countries (HIC) and LMIC will have varying levels of experience in obstetric anaesthesia, and particularly with the specific technique used. For example, LMIC trainee anaesthetists may be more experienced in obstetric anaesthesia in general, and very familiar with spinal and general anaesthesia for caesarean sections, but conversely will be less familiar with the epidural top-up or combined spinal-epidural technique.

Table 1: Comparison of elective and emergency caesarean sections performed under regional anaesthesia and rates of conversion to general anaesthesia at Leicester General Hospital over two five-year periods. Royal College of Anaesthetists standards indicated in brackets.

Year	Regional anaesthesia rate		Conversion rate	
	Elective (> 95%)	Emergency (> 85%)	Elective (< 1%)	Emergency (< 3%)
2005	95.0%	86.6%	2.5%	5.4%
2006	95.4%	85.0%	1.1%	7.2%
2007	98.0%	87.1%	1.4%	5.3%
2008	96.7%	77.3%	2.3%	7.8%
2009	97.0%	91.0%	2.8%	3.8%
2015	98.0%	89.0%	0.5%	2.7%
2016	98.0%	90.0%	1.0%	2.4%
2017	98.0%	88.0%	1.2%	3.3%
2018	97.4%	91.1%	0.1%	2.2%
2019	97.3%	90.6%	0.2%	1.9%

Although we are unable to compare for the two five-year periods due to lack of available data from historical audits in 2005–09, anaesthetic technique was considered as a cause of change in our conversion rate. In 2015, 45% of all caesarean sections were performed under spinal anaesthesia, 21% by epidural top-up and 26% by combined spinal-epidural. In 2019, 55% of caesarean sections were performed under spinal anaesthesia, 29% had epidural top-up and 8% combined spinal-epidural. It is possible that reduced numbers of epidural top-up and combined spinal-epidural could have contributed to reduced conversion rates, but within this five-year period proportions of caesarean sections performed under general anaesthesia have remained consistent. It is difficult to say, within this short time period, if anaesthetic technique affected our conversion rates, and it certainly would have been interesting to compare this to our techniques from 10 years previously if this information were available.

There is currently more work being performed locally to assess our technique for caesarean sections during the COVID-19 pandemic, and to see the changes that this may have caused. We would be interested to know if our colleagues have noted similar

changes in their rates of conversion and other possible causes for improvements, and how COVID-19 has affected practice.

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