

Report on Kybele Expedition, September 2006 – Georgia and Armenia

Introduction: Georgia

On our arrival in Georgia at Tbilisi airport after a 4.5 hour flight from London, we were met by our contacts including the head of Obstetric Anaesthesia for Georgia (Aleko) and taken to our accommodation. We stayed in an apartment belonging to an ex-government minister. It was very comfortable and exactly like any city apartment in any western city but alarmingly had a thick, metal, bulletproof front door. On the way we learned that there are 15 obstetric anaesthetists in Georgia who can perform regional analgesia and anaesthesia. The apartment was being rented for \$60 US per night and 3 of us were staying there. The average salary in Georgia is estimated at between \$30-60 US per month. It is safe to be out and about during the day but not so safe to walk alone at night and tourists have been targets recently for petty criminals.

Our team consisted of 11 people: 9 obstetric anaesthetists and 2 obstetricians. One of the obstetricians was also a trainee. The plan was to split up into groups of 2 or 3 and visit different hospitals. Initially we would observe local practice and then demonstrate our techniques and one day of the week was allocated for a conference at which our team gave lectures on a variety of topics.

Cultural Orientation (Monday)

Our first day was spent looking around Tbilisi and learning about local culture and a little about current affairs. Georgia was the second country in the world to adopt Christianity as a national religion after the arrival of St Nino in the 4th century. The population in Georgia is around 5.4 million. The currency is the “Lari” which is worth about £0.30. Georgia became independent in 1991 after the collapse of the USSR. Georgia immediately descended into anarchy but was brought under control when Eduard Shevardnadze became president. He held the country together until the Rose Revolution in 2003 which brought Mikhail Saakashvili to office as his replacement. Since then things have been reasonably peaceful except in the regions of South Ossetia and Abkhazia which are anarchic breakaway sub-states. Despite this the people of Georgia have been rebuilding their country and economy. There is still a problem with widespread corruption but the government is making visible efforts to eradicate this – the first step in this process was the sacking of the entire Georgian police force and renewing from a fresh base! Georgians are high spirited party people who drink lots, stay up late, get up late and are enormously hospitable. Toasting with vodka occurs extensively at dinner and not to participate it seems is taken as a personal slight. Staple diet is cheese, cheese-bread, fried aubergine, and minced meat wrapped in a type of dough/pasta and boiled. It seems that every Georgian makes his/her own wine. We were treated to a trip to the sulphur baths for a massage and a hot soak.

The next day started with meeting the public affairs representative of the US Embassy. Georgians are supporters of President Bush. The US government has a \$300 million aid project running in Georgia.

Gori Hospital (Tuesday)

Before going to Gori, which was the birthplace of one Iosif Dzhugashvili better known as Stalin, we learned that half the anaesthetic deaths in Georgia are due to failed intubation. Unfortunately there are no statistics of just how many deaths occur and asking different people seems to get you widely varying answers. Gori Hospital is staffed by 25 obstetricians/gynaecologists, 10 anaesthetists and 8 paediatricians. Gori hospital has 100 beds, 60 for obstetrics and 40 for gynaecology. They have 2000 deliveries per year and a caesarian section rate of 10-15% They do not use a vacuum extractor but the chief obstetrician is familiar with the use of forceps (not

rotational). Analgesia for forceps delivery is provided by means of pudendal block and sometimes IV ketamine is used for additional analgesia.

They have 100-150 cases per year of pre-eclampsia and approximately 5 cases per year of eclampsia. Antenatal care is offered to all women who can attend four times throughout their pregnancy for free. They will be examined by ultrasound in one of those four visits. They estimate that 5% of their parturients who deliver at the hospital have not attended for any antenatal care. They are aware that some women deliver at home without ever having medical input and they get approximately 2 cases per month attending the hospital with problems after unbooked home delivery. There are currently no General Practitioner services in Gori but there are plans to set up primary care facilities.

The hospital performs 3-4 terminations per day using diazepam and ketamine anaesthesia. It is estimated that the average Georgian woman has 3 terminations in her lifetime.

For major haemorrhages there is a blood bank available in Gori. It takes approximately 30 minutes to get blood for a bleeding patient. Patients are not routinely cross-matched. The process to obtain blood is complicated and time-consuming. The patient or their representative goes to the blood bank and pays for however many units of blood they need or can afford. Units of blood cost \$8 and cryoprecipitate is available at \$7. The blood bank then gives that person a receipt which they take to the hospital. The doctor in the hospital draws a blood sample and gives this to the person to take back to the blood bank for cross-matching. Once cross-matched the patient's representative brings the blood back to the hospital for transfusion. Blood for transfusion is screened for HBV, HCV, and HIV. The labs are available 24 hours per day for blood sample analysis. There is no HDU/ITU facility in Gori hospital which is about an hour by road from Tbilisi. After delivery, every patient receives 5IU of oxytocin. If bleeding continues the only other options appear to be ergometrine and, thereafter, hysterectomy.

There is no continuous CTG monitoring in labour but intermittent CTG is possible using an old machine. Pinard fetoscopes are the main method of monitoring the fetus. There are no protocols for labour analgesia at Gori hospital.

Caesarian section is always performed under general anaesthesia. Myopia is one of the commonest reasons why women have an elective c-section. The standard GA for c-section consists of: oxygen via facemask but not formal pre-oxygenation, diazepam 5-10mg IV, ketamine 1.5mg/kg, and pipecuronium 50mg. The patient is ventilated with 100% oxygen by facemask using the 40 year old Russian mechanical ventilator (not by hand ventilation) until the pipecuronium allows for intubation. No further anaesthetic is given until the baby is delivered, at which time 100mcg fentanyl is given iv and halothane was introduced. We were told that nitrous oxide is not available because of the cost. The neonates we saw being delivered in this manner were not surprisingly in need of some resuscitation. The paediatrician was routinely present at a caesarian delivery. The neonatal resuscitation area had radiant heaters, suction, and oxygen from a cylinder, 2 incubators and a paediatric ventilator. Tubes and equipment were generally re-usable.

The vaporizers all appear to be copper kettles. The monitoring for GA section consists of checking the patient's pulse and checking blood pressure with a manual sphygmomanometer. Not all smaller hospitals in Georgia have manual BP cuffs though, and so some GA sections are performed with pulse monitoring only. There was no other monitoring available at Gori hospital. Cricoid pressure was not applied and a left lateral tilt was never used. Postoperative analgesia was provided with diclofenac and morphine.

In the recovery room there was no monitoring available, no oxygen available, and observation charts were not utilized. Parturients remained in hospital for 7 days after a caesarian section and 5 days after a vaginal delivery.

The surgical scrub consisted of hand-washing with a brush and soap. A sterilizing agent of some sort was then poured onto the surgeons hands and the patient was prepped with betadine and draped before sterile gloves were put on. The surgeons were wearing outdoor clothes in theatre and only some people were wearing hats. There were people smoking at the door of the operating theatre.

As this was the first time Kybele had visited the hospital in Gori it seems that improvements here should focus on improving the safety of general anaesthesia, and then teaching spinal anaesthesia for caesarian section. Initial areas of concern specifically are:

1. Use of left lateral tilt for elective caesarian sections (not currently used)
2. The use of cricoid pressure (not currently used)
3. Addressing the issue of awareness
4. Provision/supply of basic monitoring equipment
5. Teaching of safe spinal anaesthesia for caesarian section in conjunction with 4.
6. Assistance with setting up epidural labour analgesia service at a later date.

It was evident the next morning, Wednesday that I had contracted gastroenteritis and was unable to leave the accommodation to go to the next hospital. I was taking loperamide out of necessity due to my rate of fluid loss but when I developed rigors I swapped loperamide for ciprofloxacin.

Lecture/Conference Day (Thursday)

Our hosts had been consulted prior to our arrival and presented with the list of lectures which we had prepared. They then chose 7 lectures of the 11 available. I had prepared a lecture on labour analgesia, including non-pharmacological methods and pharmacological and regional methods used at the Queen Mother's Hospital in Glasgow. Unfortunately my lecture was not chosen for presentation. Lectures presented were:

Regional Anaesthesia for Labour and Delivery
Anaesthesia for Caesarian Section
Complications of Regional Anaesthesia
Obstetric Anaesthesia Outcomes (ASA closed claims database)
Management of the Parturient with Cardiovascular Disease
Pregnancy Induced Hypertension and Pre-Eclampsia
Trauma in the Obstetric Patient

Birthing Hospital No.1 (Friday)

Our contact here was Dr Tamaz Jojua, one of the obstetric anaesthetists. The anaesthetist here was familiar with regional anaesthesia and the first patient we saw was having an elective section for previous c-section. It was arranged that Dr Jojua would give his typical spinal anaesthesia for the first patient and that we would give the regional anaesthetic for the second patient. The first patient was given 1000mls of Hartmann's solution prior to spinal anaesthesia. She had the local routine pre-medication which consisted of sodium citrate and omeprazole. The anaesthetist washed his hands with soap and then had an alcohol solution poured on to his hands. He then put sterile gloves on but had some difficulty as his hands were still wet. He did not wear a face mask or sterile gown.

The patient's back was prepped with betadine. Local anaesthesia to the skin was provided with 2% lidocaine. French "black-market" hyperbaric bupivacaine, 12mg, was then used to provide the spinal anaesthesia. A 25G Quincke needle was used and rotated in situ once CSF had been identified. The needle, we were told, was rotated a quarter turn to "all four quadrants" of the subarachnoid space to ensure good CSF flow, thus confirming subarachnoid placement. After the bupivacaine was injected, a syringe containing 25 mcg fentanyl was attached and this was given as a separate injection. The patient had then to lie flat, with no tilt, and her arms were tied down. Pulse oximetry, automatic NIBP and ECG monitoring were used. The patient's first BP after spinal injection whilst lying flat was 71/38. After 2-3 minutes the obstetrician performed temporary left lateral displacement of the uterus and the next BP was 86/46. At this point the obstetrician let go of the patient to scrub up. The patient was given oxygen by facemask and was complaining of nausea. After 30mg of ephedrine and 2000mls Hartmann's solution the patient had a BP of 115/81 and a heart rate of 135. She looked pale and sweaty. By the time the baby was delivered she would have received 60mg of ephedrine. During this time I noted there to be 17 people in theatre – the local anaesthetist and his 4 helpers, myself and 2 others of the Kybele team, our Georgian host, 2 obstetricians, a scrub nurse, a paediatrician and a paediatric nurse and 3 local trainees. 5IU oxytocin and 1g cefuroxime was given after clamping of the cord. The used swabs were put into plastic shopping bags and no swab count or instrument check was performed at the end. Interestingly I noticed that in this hospital there was pipeline nitrous oxide and a cylinder supply of oxygen. We anaesthetised the next patient and demonstrated the use of left lateral tilt using a rolled up rubber cushion which was in the theatre. We used a spinal anaesthetic with a 27G Whitacre needle, 12.5mg hyperbaric bupivacaine and a prophylactic dose of 100mcg phenylephrine after intrathecal injection. We did not use any "black market" fentanyl or other opioid as no-one could be sure it was preservative-free. The patient's systolic blood pressure did not fall below 110mmHg and she did not suffer any nausea. She had a good block to T3/4 and an uneventful section. The obstetrician said he could work with the tilt. After theatre we all had coffee and discussed our differences in technique. Dr Jojua agreed that the tilt contributed to preventing hypotension and told us they would continue to do this.

Areas of concern and suggestions for continued improvement:

1. Continued use of left lateral tilt. This could be audited on a future visit.
2. Supply of monitoring equipment, pencil point needles and drugs for regional anaesthesia.
3. Getting government provided healthcare to include the cost of regional analgesia for labour.

Ortachala Birth House (Saturday)

Our contacts here were Dr David Korkotashvili, lead clinician in anaesthesia and intensive care, and Dr Nikoloz Manjgaladze (General Director). This was the biggest maternity hospital that we had visited so far. It is a hospital specializing in the care of parturients who are rhesus negative and they admit these mothers from all over Georgia. The director of the hospital informed us that they have 6000 deliveries per year and around 65% of their parturients are actually rhesus negative. They provide plasmapheresis, transfusion services and phototherapy. I am not sure whether they are able to give anti-D, perhaps someone else managed to establish this. Ortachala is a private hospital. The c-section rate is 15-17% with 1% being performed under regional anaesthesia. Around 1% of the patients get an epidural for labour analgesia. The patients would have to pay extra for an epidural but it was not clear how much extra. We were told that they would do more of their c-sections under regional anaesthesia but that communication problems due to different regional language dialects prevent adequate consent due to inability to communicate. They would not say how they therefore manage to consent patients for surgery and general anaesthesia. They also told us that the drugs needed for regional anaesthesia were not available and not licensed in Georgia. In addition, regional anaesthesia was not possible because of lack of monitoring and they felt that in these circumstances general anaesthesia was safer. Staffing consisted of 47 obstetricians

plus 15 obstetric trainees, 18 paediatricians, and 5 anaesthetists plus 2 anaesthetic trainees. Later I discovered from a younger anaesthetist, with whom I spoke separately, that general anaesthesia is free for patients and that for regional anaesthesia (spinal or epidural) the hospital will charge the patient \$40. The director insisted that all their anaesthetic staff could do spinal and epidural anaesthesia with no complications but by their own figures each anaesthetist would do on average one regional anaesthetic in total per month. They were not interested in us teaching their staff but asked us to give money and equipment. This was a frustrating visit and we felt that Kybele could not run a teaching program at this hospital.

Before we left we were cheered by the publicity that the team had managed to attract. Dr Medge Owen was in contact with one of the television channels in Georgia and her interview was shown on a primetime news program at the end of our week in Georgia. This served to raise public awareness of regional anaesthesia and analgesia for childbirth and so hopefully the public will be aware of potential improvements in the care of pregnant women.

On Sunday we traveled to Yerevan by bus.

Introduction: Yerevan (Monday)

Armenia was the first country in the world to adopt Christianity as a national religion after the arrival of St Thaddeus and St Bartholomew in 301 AD. As a result there is much to see for anyone with any interest in history. The country has a population of around 3 million and possibly would have had a much greater population were it not for the Armenian genocide in the first part of the 20th century. After years of war, which included enduring earthquakes, Armenia is still re-building but the progress is rapid and encouraging.

Politically Armenia is intriguing. I took the opportunity to enquire about state affairs by speaking to Dr Armen Varosyan from Erebouni hospital. There are “frozen conflicts” with Azerbaijan. That is to say there is currently no fighting but, also, no peace treaty or agreement has been signed. Armenia also has a poor relationship with Georgia and no dialogue at all with Turkey. Indeed, the border with Turkey is closed and likely to remain so for the foreseeable future. This leaves Iran as Armenia’s only trade link and local friend and, needless to say, the current nuclear program in Iran could put Armenians in a very difficult position if the western allies want to put troops in Armenia as a warning to Iran to step down its nuclear activities. The city of Yerevan appears safe to walk around during the day and at night unlike Tbilisi where it feels unsafe at night. There are lots of nice cafes and restaurants and reasonably good shops.

In Soviet times there were 500 anaesthetics/ICU specialists in Armenia. Now there are 165 for all of Armenia.

Erebouni Hospital

Our contacts in Yerevan were Professor Mkhoyan and Dr Armen Varosyan (Assistant Professor). They run the Yerevan State Medical University Department of Anaesthesia and Intensive Care. Erebouni is one of the university teaching hospitals. I spent this week at Erebouni hospital. During this time I took the opportunity to teach the local trainees about epidural and combined spinal epidural anaesthesia (CSE) and demonstrated the technique.

I took the opportunity to speak to some trainees here. Medical school takes 6 years and then residents pick a specialty. Training in that specialty usually takes 3 years and then they can practice independently. The rota would not comply with the European working time directive but is not greatly different from trainee hours of recent times in the UK. Trainees work 8 nightshifts

(8pm to 8am) each month and 8 dayshifts which are 24 hour shifts. On average they do 60-70 hours per week. They work one or two weekends per month. They have regular formal teaching and have clinical examinations every 6 months. They have 3 month attachments in subspecialty anaesthesia although it was not clear exactly what specialties other than ITU, obstetrics, and paediatrics are possible. They all spend at least 6 months in intensive care. By the end of their three years of training they are believed to be competent in regional anaesthesia techniques as well as general anaesthesia.

There are about 1800 deliveries per year at Erebouni. The c-section rate is 20% and 90% of elective c-sections are performed under regional anaesthesia using 25G Quincke needles. Sometimes aid packages are available with pencil point and smaller gauge needles which they will then use. The epidural rate for labour analgesia is about 10%. The hospital will provide labour analgesia in patients with pre-eclampsia but generally the patient would have to pay \$30 for an epidural if they want one. Epidurals are single shot doses as no catheters are available and unless disposable kits are available then epidurals are performed with metal re-usable needles and glass loss of resistance syringes. Loss of resistance to air is used. Patients usually get 10mls of either 0.125% or 0.25% bupivacaine in their epidural. No opioids were added to the epidural injection. The equipment for regional anaesthesia comes wrapped in a dirty looking piece of chamois leather, re-usable components having been decontaminated and sterilized.

Ephedrine is not licensed in Armenia and is a listed drug due to its history of abuse as a stimulant in the past. It is therefore not officially available although there may be black market supply. They are familiar with phenylephrine but it is not always available. Post-dural puncture headache (PDPH) is treated with bed rest, IV fluids, IM caffeine, non-steroidal anti-inflammatory drugs and, if required, epidural blood patching or epidural dextran injection.

The delivery rooms are basic, as they were in Georgia. They typically contain a basic bench, a radiant heater, a light, an ambu-bag, suction, re-usable ET tubes, a basic delivery table with immovable metal stirrups, but no paediatric laryngoscope – one would be brought from theatre. There is CTG monitoring but this is not routinely used continuously as there are not enough monitors and not enough paper cartridges. Automatic NIBP and pulse oximetry was available. Patients with a history of cardiovascular disease would have ECG monitoring.

In the theatre there was an old, Russian ventilator, a table which can be tilted, diathermy, pipeline oxygen, saturation, ECG and automatic NIBP monitoring. The recovery room had automatic NIBP and oxygen saturation monitoring, pipeline oxygen and even an old defibrillator. All the areas were very clean and tidy.

We watched the local clinical practice for a number of different cases and then had discussions with the local doctors. Firstly we attended elective c-sections and noted that their management was very good except for a tendency to site the spinal anaesthetic at the lower thoracic and upper lumbar level despite knowing that it should be sited ideally lower than L2 to avoid cord damage. During the lectures at the conference day in Yerevan Dr Philippe Gautier from Belgium presented the topic of neurological injury after regional anaesthesia and stressed the importance of using a level below L2 to avoid cord damage.

We also attended the gynaecology list and observed a total abdominal hysterectomy under general anaesthesia. Induction was again with diazepam, ketamine, fentanyl and atracurium. The patient's preoperative haemoglobin level was 4.8g/dl. She did receive a 2 unit blood transfusion post-operatively but we were unable to find out her next haemoglobin result. This patient had a failed intubation and desaturated to 37% on the monitor while repeated attempts were made at intubation without ventilation in between attempts. This patient was extubated at the end of the operation but spent the night post operatively in ICU and was slow to regain consciousness. There was no failed

intubation protocol or difficult airway equipment nearby although we were told that they did have laryngeal mask airways in the hospital. We discussed pre-operative airway assessment, patient positioning, difficult airway protocols, and management of failed intubation.

In addition we observed a third (final) year resident attempt epidural anaesthesia. The resident seemed unfamiliar with the technique and required instruction throughout. Unfortunately the patient suffered a definite dural puncture with a 16G Tuohy needle but it seemed that she might be lucky enough to avoid a PDPH. Fortunately this was at the beginning of our week and we were able to review her daily for the remaining three days and she remained without a headache during this time.

My overall impression of the non-academic anaesthetists at Erebouni was that their theoretical knowledge was excellent and their confidence in their ability high but, as we observed, these things did not seem to translate into good, safe clinical practice. Spinal anaesthetics were performed at too high a level, pre-operative care and preparation was seen to be inadequate, and it did not look likely that final year trainees would be able to practice regional anaesthesia safely by the time they would complete their training. We addressed these issues locally at the time and also some of these areas were covered in the lectures but without a return visit to audit the effect of our teaching it will be impossible to know if we have improved the safety of anaesthesia delivered.

I believe a return trip would be beneficial and that improvements can be made at Erebouni. Areas for focused teaching should include:

1. Pre-operative assessment and preparation for major surgery
2. Refresher courses on regional anaesthesia.
3. Regional anaesthesia teaching for residents if permitted by local supervisors.
4. Help with provision of drugs and equipment.
5. Encouragement to audit local practice.

Conclusion

It feels unkind to criticize people who have lived through hardship greater than I could know, and who are making the best of what is available and working hard to re-build their homes and their country. The people of Georgia and Armenia whom we met are kind, generous and welcoming. I am grateful to them for allowing us to visit them and to observe their practices. This would be stressful for us too if it were the other way around.

They struggle with a severe lack of money, drugs, medical equipment and general supplies. In Georgia there is a need for all of this and also for further structured teaching of safe general and regional anaesthesia techniques. An epidural service is not an achievable goal yet for the parturients of Georgia but, with the provision of some basic drugs, monitoring and the ongoing teaching of spinal anaesthesia, caesarian sections could be much improved in terms of safety. Epidural analgesia for labour could then be built on this foundation.

In Armenia it was apparent that denial of the existence of a problem is one of the ways that at least one large maternity hospital was dealing with the issue of inadequate care of women and childbirth. Establishing an epidural analgesia service at Erebouni hospital would only be achievable if the government would agree to pay for it on behalf of their people. I note also that there seem to be many maternity units in both countries with 500-2000 deliveries per year and in the future there may be a place for merging these centres to improve health services, reduce costs and increase the experience of staff looking after these parturients.

It was an unforgettable experience during which I learned a huge amount about the culture and history of the Caucasus region, a little of the language in Georgia and Armenia, and something about providing anaesthesia with few resources. We are very spoiled in the UK, and although our healthcare system has its problems they seem trivial in comparison with those of many other countries. As trainees we complain about the reduction in training with changes in working hours but although our experience may be reduced, we have been taught the techniques and principles of *safe* practice by our consultants and if we apply these principles to situations where we have less experience then I believe we can still provide good quality anaesthesia for our patients in the future. It was never more obvious to me than on this trip that the anaesthetist really is the most important monitor in the operating theatre.

I made good new friends and shared some amazing experiences with them and I hope to work with them again in the future. Thanks to all of you for being such great companions on the trip. And a big thanks to my two flat-mates, Wendy and Anita, for putting up with me when I was not feeling well – I miss you all!