From SIRS to Sarees: Intensive Care in India

NIKKI BLACKWELL, MB BS, BSc(Hons), FRCP, FRACP, FAChPM, DTMH, FJFICM
Intensive Care Senior Registrar, Princess Alexandra Hospital, Brisbane, Australia

CAROLE FOOT, MB BS(Hons), FACEM, FJFICM
Intensive Care Senior Registrar, Princess Alexandra Hospital, Brisbane, Australia

Dr Blackwell worked as a consultant physician in Mt Isa for 10 years, with a special interest in indigenous health issues. Worried about deskilling after working "out bush" for so long, she returned to the 'ivory towers' to retrain in intensive care and completed her FJFICM this year. Her main areas of interest are cardiothoracic intensive care and inequalities in global (including Australian) health-care. She is currently working with Medecins sans Frontieres in Paris, to develop the use of acute peritoneal dialysis in treating crush syndrome in earthquake victims.

Dr Foot graduated from the University of Queensland in 1995, before embarking on a career in Critical Care. She completed an Emergency Medicine Fellowship in 2003 then commenced Intensive Care training at the Princess Alexandra Hospital, Brisbane. She was awarded the Don Harrison Medal for outstanding performance in the 2004 JFICM Fellowship examinations and has recently finished training at the Prince Charles Hospital.

In this article, we share reflections and observations about our recent four week visit to India. In May 2004, the opportunity arose for two post-Fellowship Intensive Care senior registrars to travel to India, after a small contingent of Indian intensivists had observed the Fellowship examination of the Joint Faculty of Intensive Care Medicine, ANZCA/RACP at Royal North Shore Hospital, Sydney. Their vision was to establish an Intensive Care training and certification program in India, based closely on the Australasian model. Their first examination was scheduled for November 2004.

It was planned that one Australasian Senior Registrar would visit a number of centres in India to help prepare exam candidates. The visit would be supported by a major sponsor of the Indian Critical Care Education Foundation (ICCEF), under the title of the "Claris Fellow". We were both offered the opportunity to make the trip and asked to decide which one of us would go. Having become friends during the examination preparation period, it became clear that neither of us wished to go without the other, so we travelled together.

We arrived in Mumbai in the first week of November 2004, for a four week tour organised by Dr Praveen Jain, President of the ICCEF. As we were expected to take a major teaching role in formal and impromptu presentations, we stepped off the plane armed with a range of lectures, teaching resources and a sense of adventure.

Itinerary

We visited five hospitals. These were located in Mumbai (Jaslok Hospital) and Pune (Ruby Hall clinic) in the west, and Cochin and Kozhikode (Amrita Institute of Medical Science, Calicut Medical College Hospital and Malabar Institute of Medical Sciences) in the south. We also toured Delhi, Agra, Jaipur and Jodhpur in northern India. (See Figure 1.)

Reflections

This was Carole's first visit to India. "It was sensory overload from the time I stepped off the plane. The population density is overwhelming. The noise of auto rickshaws (motorised three wheelers) and crazy taxis, the lazy cows, camels, goats and dogs nonchalantly weaving through the traffic is incredible." For Nikki, who had travelled in

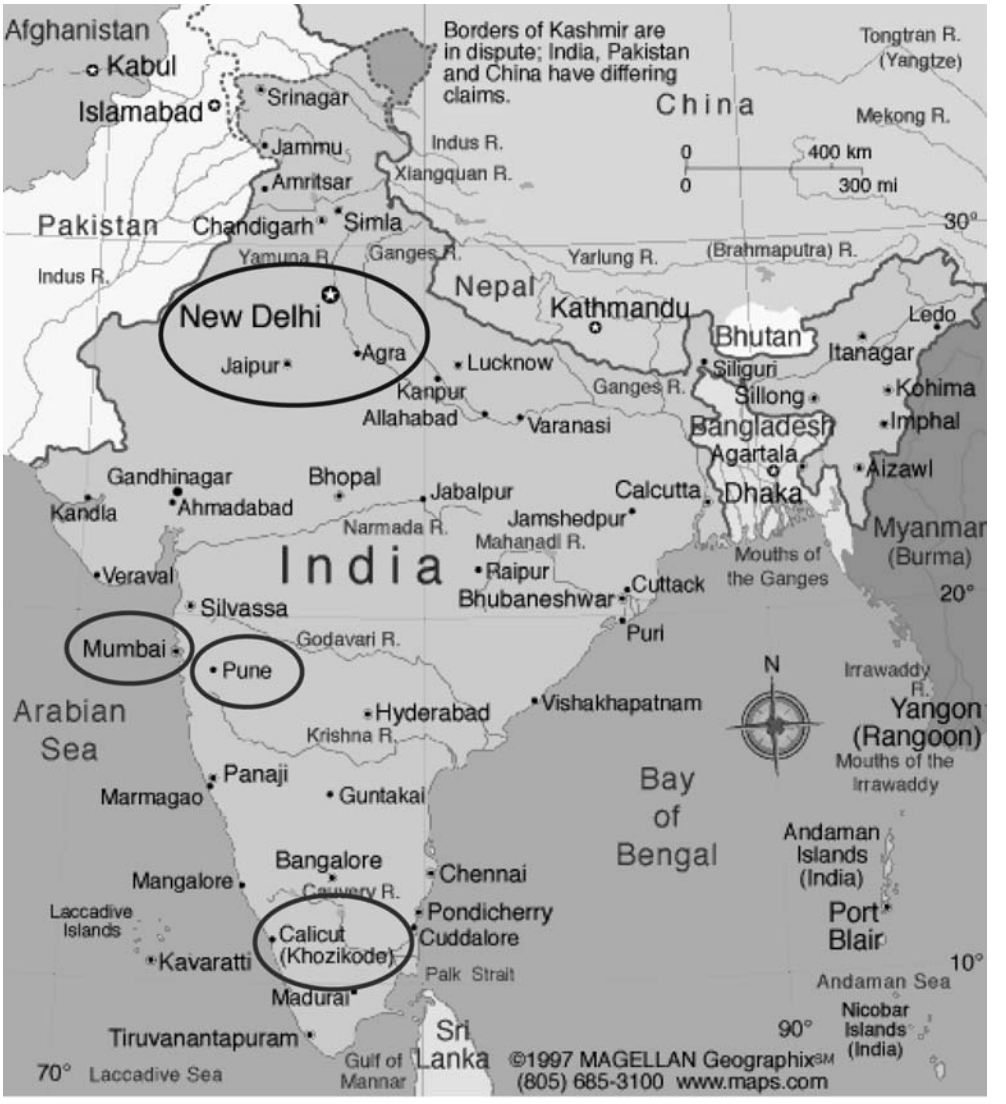

Figure 1. Map of India.

India many times, and also worked in an Indian public hospital during her student elective, it was an opportunity to experience a different aspect of Indian health care. For both of us, one of the highlights of the trip was being taken for some retail therapy in Mumbai by Dr Rekha Jain, Praveen's wife, and their daughter Aditi to a textile store, to choose from the most beautiful silk sarees. The religious diversity was exemplified by the major festivals we observed during our trip — Diwali (Hindu), Eid (Muslim)and Christmas preparations. The local custom is to refer to distinguished teachers as "Sir"; the presence of two women teachers caused only temporary confusion until we were introduced as "Madam Sirs".

The Health Care System

India is a country of intense contrasts with extremes of poverty and opulence. Beautiful sights, such as the Taj Mahal, are bordered by unsealed streets with open sewers. The health system is also full of paradoxes. Our appraisal of the Indian health care system is level 5 evidence (at best). We obtained a "very small look at a really big place".

The most important distinction from Australia is the lack of a universal health insurance scheme, like Medicare. There are three distinct funding models for health care, with major implications for Intensive Care services. The first is a corporate model with private hospitals offering a broad range of medical services, including Intensive Care. We visited three hospitals of this type, all with well equipped ICUs, matching what might be found in a metropolitan hospital in Australia. The second is a charity model, with wealthy patrons owning and operating private facilities which may incorporate ICUs. In such centres, patients may pay for treatment (similar to the corporate model) or have subsidised or free care, depending on their income. The facility of this type that we visited was most impressive, with a highly efficient cardio-thoracic surgical ICU and a strong commitment to the improvement of critical care services.

Unfortunately these two models serve only a small sector of the population, leaving the third model, the gravely under resourced public health care system which struggles to meet the basic health care needs for the majority of the Indian population. We saw no evidence of Intensive Care medicine being practiced in the facility we visited. One chilling image, in an overcrowded public hospital emergency department, was of a young man dying from readily treatable traumatic injuries.

Evolution of Intensive Care in India

As in other countries, the concept of Intensive Care Units arose from the establishment of Coronary Care units (CCU). The first CCU was established at the King Edward Memorial Hospital, Mumbai in 1968. The care of a critically ill patient with poliomyelitis at the Breach Candy hospital in Mumbai served as an important landmark for the development of ICU in that city. The Indian Society of Critical Care Medicine (ISCCM) was formed in 1993, under the presidentship of Dr. Praveen Kumar Jain. The ISCCM publishes a monthly peer reviewed journal "Indian Journal of Critical Care Medicine", which is indexed on Medline.

Since 1993, a certificate program based on two years experience, a written exam and a viva has been offered under the auspices of the ISCCM. Alternatively a National Board exam in Critical Care awards a "Post-doctoral Fellowship in Critical Care". The more recently established Indian Critical Care Education Foundation (ICCEF) has

gone a step further in aiming to provide a consistent standard of education and certification for ICU practitioners, and here lies the impetus for a new system based on the Australasian training model. Discussions with doctors practising in ICUs showed that overseas experience was highly valued and Australian clinicians were particularly respected. One doctor noted as a qualification on her business card that she had spent time as a Senior Registrar in Sydney.

Defining Intensive Care

Unpublished data, obtained from a survey by Dr Praveen Jain, suggests that there are approximately 30,000 medical facilities in India, of which around 13,000 have an area called an ICU. India has a population of approximately 1 billion, compared to Australia with a population of 20 million and 53 hospitals currently accredited for ICU training.[1]

The number of ICU beds is unclear and what constitutes such a bed is ill defined. For example, among the hospitals we visited with an ICU, we were consistently told that they had vast numbers of beds — 175 at one centre. On closer observation, it emerged that any bed with some form of monitoring is termed an ICU bed. Confining the definition to patients with high acuity nursing who are ventilated and/or receiving vasoactive drugs, the bed number is considerably smaller (e.g. around 30 at the centre with "175" beds). Patients are grouped in units based on principal diagnoses, with separate areas such as "Neuro ICU", "Medical ICU" and "Cardiothoracic ICU", rather than variably sized general units such as seen in Australia.

Staffing of the 13,000 facilities offering critical care services is highly variable. Overwhelmingly it is by junior staff, 70% having a basic medical degree (MB BS) alone. In 7% of settings there was a more senior doctor, most often with an MD in medicine or anaesthesia that required at least three years of postgraduate training and a certification exam process. Interestingly, 13% of staff have homeopathy or ayurvedic skills alone.

Data are now emerging from India about the epidemiology and process of Intensive Care. A recent study from Mumbai[2] considered outcomes from a single ICU in a public hospital. They reported on 993 patients with APACHE II score of 14.9 (±9.6), whose predicted mortality was 21.7%. The observed mortality was 36.2%, a 1.67-fold increase in mortality compared with patients with similar APACHE II scores in the USA. The main conclusion was that patients may have a lesser intensity of care than provided in the USA, with fewer nurses looking after more patients. Other published data from Indian ICUs provide valuable information on the epidemiology and management of tetanus, and the widely different aetiologies of Multiple Organ Dysfunction as compared to Western ICUs.

Educational resources

Doctors we met had ready access to modern medical resources. All non-public facilities had large information technology departments which supported clinician internet access. There was widespread awareness of web-based resources such as Pubmed, on-line journal access (with the *New England Journal of Medicine* valued highly), as well as *Oh's Intensive Care Manual,* which had been reprinted locally by an Indian publisher. In general, doctors appeared motivated to learn and read, but admitted that they often found it difficult to translate theoretical knowledge into practice (e.g. mastering fluid balance, vasoactive drug therapy and ventilation strategies in the critically ill).

Intensive Care Practice

Case-mix

We were privileged to observe the daily routine of Intensive Care in several units. We saw a huge spectrum of patients. In one ward round there were patients with dengue (one with dengue fever and another with dengue shock syndrome), AIDS (pneumocystis pneumonia in one, disseminated pneumocystis and toxoplasmosis in another), hypoxic brain injury after hanging, pancreatitis caused by Ascaris lumbricoides infection of the pancreatic duct, gas gangrene in a forearm wound in a multi-trauma victim, hypertensive crisis, organophosphate poisoning, gunshot wound to the chest, decompensated chronic liver disease with hepato-renal syndrome, community acquired pneumonia in patients with diabetes and another with peritoneal dialysis dependant chronic renal failure, biliary sepsis, respiratory failure from alveolar cell carcinoma, cardiogenic shock, ulcerative colitis with toxic megacolon and a patient for post-operative care after a radical mandibulectomy for tumour.

Infection control policy

Besides case mix, a major contrast between these units and our own was the infection control strategies. All units required visitors and staff to remove their shoes before entering, so they went barefoot or applied purpose-specific thongs or slippers. Some doctors agreed that there was no scientific evidence supporting this practice, but found it useful to promote a controlled environment (reminiscent of visiting a temple) where shoes are removed, voices lowered and respect observed. Topical alcohol based anti-septic hand rinse was the principal measure for hand washing, which was recognised as central for infection control; bottles of "sterilium" were readily available throughout the units.

Antibiotic prescribing differed dramatically from Australia. There was no defined antibiotic policy and we saw no evidence of infectious disease specialists on ward rounds. This may explain why inappropriate antibiotic usage, and combination therapy with similar antibiotics, was often seen. Furthermore, there did not appear to be routine microbiological surveillance to inform clinicians about drug resistant organisms. As a result, there was no data about multi-resistant gram negative organisms and MRSA. This would certainly provide a major obstacle to an informed choice of directed antibiotic therapy.

Open vs closed units

All the units visited operated as "open" units. Many doctors expressed frustration and acknowledged that patient outcomes sometimes suffered because they lacked the capacity to make autonomous decisions. The perception was that the sub-specialty doctor previously managing the patient usually had the final decision about management, even when the intensivists felt this was wrong. One newly admitted patient was drowsy and hypotensive with oliguria, acidosis and severe dehydration due to sepsis. The patient had been referred to the unit with a working diagnosis of pulmonary oedema and likely acute renal failure, with orders for fluid restriction from his admitting physician. After some heated discussion between the intensivist and the physician, the patient was given five litres of crystalloid and dramatic improvements in perfusion, urine output and mentation were seen.

Miscellaneous

From an Australian perspective, where protocols abound, we were struck by the

general absence of protocols for dealing with common problems (e.g. electrolyte replacement, fluids, stress ulcer or DVT prophylaxis).

We did not have time to assess the nursing roles or training in the units visited. We did not meet or see any physio- or occupational therapists, although we were aware that units had social workers to liase with families and to address financial issues. We saw many long-stay patients with contractures, foot drop and pressure sores. Nurses we spoke to were overwhelmed by our descriptions of nurses' roles, training and professional status as members of an Australian critical care team, of equal importance with medical and allied health practitioners.

In one institution, there was a practice of regular prone positioning of all ventilated patients for postural drainage as a physiotherapy tool. We realised that the perceived risks of proning, most importantly accidental extubation, were felt to be minimal in the local population because patients were almost never overweight. Indeed, we estimated the average body weight of patients to be 50 kg and we saw no morbidly obese patients, a striking difference to Australia.

We did not gain significant insights into the function and structure of the individual hospitals. It was apparent that engineering and design issues were subject to problems. During a single ward round in a very large and prestigious private ICU, there were two power failures and one total gas supply failure, each met with the non-stressed approach that familiarity brings. We did not see the pre-hospital, primary care or ward infrastructure for managing critically ill patients. A general observation was that hypoxic ischaemic brain injury from delayed resuscitation was a major problem, adversely affecting the outcomes of patients admitted to ICUs.

Teaching Opportunities

We spent many days teaching large numbers of people ranging from exam candidates, doctors of all levels working in ICU, operating theatres, wards and casualties, administration, medical students and nurses. The sessions varied from small groups on ward rounds to packed auditoriums. Many of our lectures were videotaped for further distribution to staff unable to attend. At one facility we were asked to meet the CEO and give an appraisal of critical care services, making recommendations for improvements.

One highlight was a two hour ACLS "workshop" delivered to approximately 300 people, the majority local medical students. We taught ILCOR resuscitation algorithms with a resuscitation manikin and other commonly used equipment. We demonstrated BLS and ALS and ensured members of the audience participated in the session, which was received with tremendous enthusiasm. For many of the attendees, it was their first experience of resuscitation.

The material covered was broad and for us served as a review of the entire Fellowship exam curriculum. At each location, we presented the recent "Surviving Sepsis Guidelines",[3] evidence based ICU practice which could be generalised to the management of many other critical illnesses (e.g. protective ventilation strategies). Management of traumatic brain injury and raised intracranial pressure, fluid therapy in critical care and nutrition were also frequently discussed. A large session on organ transplantation and setting up a service, focussing on the role of ICU within a broader context, was requested at one hospital. A significant amount of time was devoted, at the doctors' request, to approaches to prognostication for neurological outcome in hypoxic-ischaemic brain injury, end of life decision making, withdrawal of active

therapy and palliative care in the ICU. Certification of brain death, a recently introduced concept in India, was also popular, particularly issues covered in the ADAPT course about communication with families and between health care team members.

Doctors commonly described feeling inadequate talking to patients and their families about death. They acknowledged a general distancing between doctors and families. For example, in Kerala the tradition in hospitals is to call family and close friends "bystanders". A huge socio-economic and cultural divide between doctors and lay people may contribute to this; doctors in India, both within and outside the healthcare system enjoy an elevated status well beyond our personal experience.

The exam candidates (for the Part I exam) were prepared both in the classroom and at the bedside in vivas and hot cases. Radiological OSCEs were very popular. We stressed that the exam and the daily practice of ICU should be approached in the same way — with thorough clinical assessments, a problem based approach to individual patients and structured management plans.

Indo-Australian Training Program

The trip culminated in the 3rd Indo-Australian Critical Care Training Program in Kozhikode. This three day conference was well attended by clinicians and nurses of all levels from across India. The faculty comprised both Australians and Indians. The first course was attended by Drs Bala Venkatesh and John Morgan from Brisbane. They were joined by Dr Chris Joyce, also from Brisbane, in 2004. This year we also participated as Australian faculty, together with Brisbane Intensivists Drs Chris Joyce, Meher Chinthamuneedi, Amod Karnik and Assoc. Professor Bala Venkatesh, who was awarded the "Claris International Critical Care Lifetime Achievement Award" for his support in the development of critical care in India. The theme of this year's meeting was data interpretation. Between us we gave lectures on abdominal X-rays, cardiothoracic ICU vignettes, common biochemistry data sets, ECG problems and we shared a workshop on renal replacement therapy.

Our trip ended with the first examination administered by the ICCEF, designated as the "Part 1 Examination in Critical Care". Candidates were assessed using a multiple choice paper, in addition to the ANZCA Joint Faculty of Intensive Care model of vivas, OSCEs, short and long cases. It was fascinating to observe the first examiners, comprising both Indian and Australian faculty, meeting to discuss the administration of the exam. The standard for passing was deemed to be the level of a competent registrar within the Australasian system.

The Future

The vision of the ICCEF is that the "Part 1 Examination" will encourage a large number of doctors working in Intensive Care to strive for this level of competency. A proportion of these with additional commitment and experience, will aim for the "Part 2 Examination". Plans for this process are evolving. It is expected that the Indo-Australian training program will continue as an annual event. The possibility of Australasian ICU senior registrars travelling to India in the future will be explored.

Conclusions

It is often said that teachers, in the process of preparing and presenting their material, benefit more from teaching than their audience. We both gained enormously

from the teaching on this trip, which although demanding and tiring, was often exhilarating. We both felt inspired by the enthusiasm and thirst for knowledge demonstrated by everyone we met professionally. We frequently reflected that we had rarely seen such a committed approach to learning back in Australia. Our decision to tour together enabled us to maintain a demanding schedule, delivering the high quality teaching that our colleagues in India deserve. While the specialty of Intensive Care is in its infancy in India, we met a large number of doctors keen to enhance their skills and knowledge in this discipline. It is hoped that on-going collaboration with Australian Intensivists will help in the evolution of the specialty.

Acknowledgements

We gratefully acknowledge the generous funding for Dr Carole Foot by Claris. Dr Nikki Blackwell used part of her Matt Spence Medal award, plus a grant from the Princess Alexandra Hospital to meet expenses.

References

1. www.jficm.anzca.edu.au
2. Parikh CR, Karnad DR. Quality, cost, and outcome of intensive care in a public hospital in Bombay, India. *Crit Care Med* 1999; 27(9):1754-1759.
3. Dellinger RP, Carlet JM, Masur H et al. Surviving Sepsis Campaign management guidelines committee. Surviving Sepsis Campaign guidelines for management of severe sepsis and septic shock. *Crit Care Med* 2004; 32: 858-873; *Intens Care Med* 2004; 30: 536-555.