

EDITORIAL VIEW

Improving obstetric anesthesia training in developing countries

Samina Ismail, FCPS

Professor, Department of Anesthesiology, Aga Khan University, Karachi (Pakistan)

Correspondence: Professor Samina Ismail, Department of Anesthesiology, Aga Khan University Hospital, Stadium Road, P. O. Box 3500, Karachi-74800 (Pakistan); Tel: +92 21 3486 4639; +02 21 3493 0051, Ext. 4639; Fax: +92 21 3493 4294; E-mail: samina.ismail@aku.edu

ABSTRACT

Obstetric anesthesia refers to peripartum anesthesia and analgesia care provided during antenatal period, labor, vaginal delivery, cesarean sections, removal of retained placenta, morbidly adherent placenta, antepartum and postpartum hemorrhage and postpartum tubal ligation. In wide perspective, obstetric anesthesia also includes neonatal resuscitation, caring of the parturient with systemic disease, and obstetrical intensive care management. Specialized training is mandatory to reduce maternal and neonatal mortality and morbidity, especially we need to have structured emergency obstetric care training in developing countries. Local associations and societies need to join hands with national and international associations to launch specific training in this neglected field.

Key words: Anesthesia, Obstetric; Obstetric Labor Complications; Curriculum; Training; Mortality; Mortality Rate; Maternal Mortality; Maternal Death; Perinatal Mortality

Citation: Ismail S. Improving obstetric anesthesia training in developing countries. *Anaesth Pain & Intensive Care* 2016;20(1):8-12

In developed countries, obstetric anesthesia is recognized as a subspecialty of anesthesia with fully established fellowship and master's programs. These programs aim at educating obstetric anesthesiologists with the overall objectives of enhancing the quality of anesthetic care for obstetric patients, improving patient safety and satisfaction.

However, there is a lack of infrastructure for specialist training in most of the developing countries. In South Asian countries, medical graduates undergo five years of education and a one-year internship. Specialization in anesthesia requires an additional 4-5 years postgraduate training. To qualify as obstetric anesthesiologists one requires additional 1-2 years of fellowship. Therefore, it takes 10-12 years to produce one obstetric anesthesiologist. A medical college with 100-200 annual slots for MBBS each year has only 3-6 anesthesia training slots per year, and usually one seat for fellowship in obstetric anesthesia.¹

Need for training in obstetric anesthesia:

Around half a million maternal death occur every year and almost all in developing world.² In 2013, an estimated 289000 mothers died during pregnancy and childbirth, across the globe.³ Maternal mortality ratio (MMR) in 2013 was 16/100,000 live births in developed countries and 230/100,000 live births for developing countries.⁴

Although MMR of Pakistan has been reduced from 400 in

1990 to 230 in 2013.⁴ Currently, Pakistan is off-track and lags behind the target (140) set for 2015.⁵ Lack of trained doctors was among the common contributing factor towards higher mortalities in Pakistan.^{6,7}

Increasing access to emergency obstetric care (EmOC) when complications occur during peripartum period has been shown to be the most effective intervention for preventing maternal deaths. Anaesthesia is an essential component of comprehensive EmOC. However, in many developing countries, the lack of specialized staff to provide care in public sector rural hospitals is a major obstacle in the expansion of EmOC.^{8,9} This is true for many South Asian countries including Pakistan which faces a shortage of anesthesiologists in highly populated rural areas.¹⁰

Provision of facilities for cesarean section and repair of ruptured uterus in referral facilities has shown a reduction in maternal mortality.¹¹ For the proper operation of these services, emergency anesthesia services need to be available with properly trained staff. Due to lack of training of staff in the provision of obstetric anesthesia services, these services are provided by an untrained person or referral to another facility requiring transportation which requires time which may not be available jeopardizing the life of a mother and baby.

Reasons for not non-availability of emergency obstetric anesthesia services in underdeveloped areas:

Low level of training slots for the specialty of anesthesia: This problem is encountered mostly in South Asian countries. This is reflected in production of fewer specialists in the country. For a country like Pakistan with a population of 145 million, the numbers of qualified anesthetists are only 1,163 with a ratio of anesthesiologist to population ration 1:60,000. In Pakistan the rural population is estimated to be 89.3 million and if we assume that rural-urban ratio of distribution of specialist is 1:4, then the ratio of anesthesiologist to rural population would be 1:306, 100.¹² Similar situation is observed in other South Asian countries like in Bangladesh only 25-30 anesthesiologists are produced per year¹³ and worst situation is observed in Afghanistan with a population of 32 million, there are only nine specialist anesthesiologists in the country.

Emigration: It is one of the major reasons leading to shortage of anesthesiologists in South Asian countries. This has started many years back as in the year from 1997-2000, there were 25-3000 anesthesiologist trained in Pakistan who worked abroad.¹⁴ Similarly in the same year 37% of Sri Lankan anesthesiologist migrated to countries including United Kingdom and United States,¹⁵ and 30% anesthesiologists trained in Nepal left the country permanently.

Development of Medical Sciences: This led to an increase in the number of high value complicated surgery leading to an increase in the demand for anesthesiologist in urban areas and in private sectors. Further, it led to the shortage of qualified anesthesiologist who practices in public sector hospitals, who perform less complicated but lifesaving obstetric surgeries for poor women.

How to overcome this problem?

In order to overcome the shortage of specialist including anesthesiologists, shifting task to lower cadres has been tried and has been found to an effective and a cost effective method to improve coverage and accessibility to the medical services.^{16,17} The World Health Organization has defined "Task Shifting" as "the process whereby specific tasks are moved, where appropriate, to health workers with shorter qualifications and shorter trainings".¹⁶

The utilization of mid-level providers for anesthesia began as early as 1909 and has been used in more than 100 countries, irrespective of the availability of specialists or economic development of the country. Task shifting started with non-medical personnel for public health interventions like family planning programs, immunization campaigns, malaria prevention and treatment, and HIV/AIDS treatment and care.¹⁸ However, secondary care including lifesaving obstetric surgeries requiring specialized anesthesia services should remain the domain of doctors.

Efforts have been made in the South Asia for provision of anesthesia services through task shifting to medical officers and mid-level health workers. However, different countries have shown varied results in starting and retention of these programs.¹⁶ Although data regarding task shifting is scarce from the developing countries, task shifting programs in Afghanistan, Bangladesh, Bhutan, India and Sri Lanka have shown improvement in the coverage of anesthesia services.^{8,19} No data regarding task shifting is available for Pakistan. Among the South Asian countries Sri Lanka is the only country that is successful in reducing maternal mortality by increasing the availability skilled birth attendance and EmOC.¹

Who should be trained and for how long?

The concept of task shifting of anesthesia services to mid-level providers has been endorsed by international organizations.

The World Health Organization and the World Federation of Societies of Anesthesiologists recommend that training of one to two years to health workers in anesthesia can safely provide anesthesia.²⁰ In 1992, the International Association of Obstetricians and Gynecologists (FIGO) proposed that tasks relating to maternal health be delegated to other cadres of health workers.²¹ Studies from United States have also shown no difference in the rates of complications and postoperative outcomes between anesthesia provided by the nurse anesthetists and specialist anesthetists.^{22,23}

There is no structured model for task shifting for obstetric anesthesia in South Asia and many are still on ad hoc basis. There is limited documentation of task shifting programs in anesthesia in South Asian countries. No information on task shifting efforts is available from Pakistan. Surprisingly geographically smaller South Asian countries like Afghanistan, Bhutan, Nepal and Sri Lanka have taken the initiative to establish these programs and bigger countries like India and Bangladesh have joined the efforts of task shifting.

Task shifting programs in South Asia: Some information regarding the efforts of task shifting is available from these countries. In Afghanistan there is a high MMR, where 1900 mothers out of 100,000 die while giving birth. Currently, there are 399 non-specialist providing anesthesia services in Afghanistan, out of which 320 are general technicians who have not received any formal training in either medicine or anesthesia. Now under this task shifting program they are training non-doctors to provide anesthesia services. They aim to train fifty nurses per year for duration of one year to provide anesthesia services.^{24,25}

In Bhutan, this program was started in 2002, and they give training to nurses for one month in Bhutan and then one year in Bangkok, Thailand. They aim to produce three to

improving obstetric anesthesia training in developing countries

four nurse anesthesiologists each year.²⁶ In addition their efforts are also directed towards producing one trained anesthesiologist each year.²⁵

In 1996, Nepal with the help of UK Department for International Development (DfID), the Nick Simons Institute and Jhpiego started a program to train non-physicians including nurses and health assistants to provide anesthesia services. The duration of training was increased from three to six months.²⁷

Even though task shifting is practiced in some South Asian countries but Sri Lanka is the only country that has been able to reduce MMR by increasing the availability of skilled medical personnel and EmOC.²⁸ In Sri Lanka medical officers are trained for 6 or 12 month by the college of Anesthesiologists of Sri Lanka and work under the consultant anesthesiologist. Therefore these medical officers are able to develop skills and confidence in giving anesthesia under the direct supervision of a specialist, in close collaboration with the college of Anesthesiologists.

In Bangladesh in the year 2000, MBBS doctors were trained as a part of postgraduate training on a traditional model where junior doctors work with senior doctors in an apprentice mode. This training was then adapted with the assistance of Jhpiego and the Averting Maternal Death and Disability program to become a 17-week, competency-based training, in order to increase output of trained doctors. A sharp increase was observed in number of centers having functional EmOC, and one of the reasons was the availability of trained medical personnel.¹

In India, the Life Saving Anesthetic Skills program was started in the state of Gujarat in the year 2006 which followed the Government of India guidelines.²⁹ This program later on expanded to 21 states in the country, with support of the Government of India under the National Rural Health Mission program. In this program MBBS doctors were trained with support from the Averting Maternal Death and Disability program and the MacArthur Foundation.

Problems encountered in the initiation and successful implementation of Task shifting:

Unfortunately no effort has been made in this direction in Pakistan as no evidence is available in the literature regarding any data from Pakistan. However, South Asian countries that have made effort in this direction and were successful to some extent in improving the coverage of anesthesia services but still many of them still are running on an ad hoc basis. Sri Lanka is the only country that has been able to reduce their MMR through this program.

The following problems are encountered in the initiation and implementation of these programs:

Resistance from political societies and Government policy makers:

Professional societies protect the interest of their members by resisting the use of mid-level providers.³⁰ In India a court case was lodged in 2006 against Life Saving Anesthetic Skills program on the basis that government is applying double standards to urban and rural areas.¹

Policies are mostly made in large metropolitan cities by specialists in urban areas, who can create an impression that anything below their level of training is a low quality care and such step will lead to discrimination between the care provided to rural population. As a result the government policy makers don't want to get into this controversy of different care provided to rural and urban population. The impression that rural areas should not be provided low quality care in reality leads to no care provided to them.

Absence of political and administrative will to recognize the importance of the need of anesthesia services: The Bulletin of Rural health Statistics from India reports the availability of surgeons, obstetricians and pediatricians with no data on anesthesiologists. A country like Sri Lanka where the political will has existed has led to successful implementation of this program with reduction of MMR.

Requirement for successful initiation and implementation of task shifting in EmOC:

This task needs to be undertaken by the professional societies with the help from the government and following needs to be given due consideration:

Good quality competency based training program: This should be first step before implementing anesthesia task shifting program. Specific guidelines need to be made available for the training program which should specify the requirements of site as where the training would be conducted and for how long. It should also include selection criteria of trainees as who will be trained (doctors or non-doctors) and how they will be assessed and certified to work independently to provide anesthesia services. The most important component is the content of the program including modules and competency based learning and this should be made in consultation with the expert in the field ideally from professional societies. In addition refresher training with continued mentoring or technical support for trained personnel needs to be incorporated in the program.

Supportive managerial arrangement: In order to run such program health system managers must be appointed to oversee the running of such program and involve in recruitment and development of staff. In addition a quality assurance program should be in place and looked after by them to improve and maintain the quality of training and monitoring should be in place by periodic evaluations.

Incorporation of quality assurance and safety measures: This should involve the use of standard clinical protocols and supportive supervision. In addition there should be

independent examination of the trained doctors at the end of the course and on regular basis. The trainees should work under supervision of the qualified anesthesiologist directly or indirectly during their training period, which provides a provision for safety and quality.

Job description of Task shift employee: There needs to be a written down job description which should be uniform for all task shift employees across the country. The health care managers must ensure motivation of trained staff through recognition and rewards. The workers should not be overburdened to provide anesthesia services in addition to their regular duties. There should be a provision of additional remuneration to medical officers who are providing anesthesia services. A well-defined career path is an important incentive for the people to get trained and then to perform and continue their jobs. This will lead to retention of well-trained motivated staff.

Availability of equipment and drugs: It is essential for the sustainability of anesthesia coverage for obstetric services. A study conducted in Uganda revealed that only 6% of anesthesia had adequate equipment and drugs to provide safe anesthesia for cesarean section.³¹

Legal Protection: For the sustainability, such programs need be endorsed by the government, with legal protection, licensing by a competent authority and registration to provide anesthesia services.

CONCLUSION

There is a need to expand coverage of obstetric anesthesia services to decrease the MMR of any country. There is a need to provide adequate training of obstetric anesthesia to health personnel providing coverage in an area. In many South Asian countries the idea of task shifting has emerged to overcome the significant shortage of anesthetist in rural areas, where both mid cadre doctors and non-doctors are trained to perform this task. Among the South Asian countries, only Sri Lanka has been successful in decreasing the MMR by such programs. In a country like Pakistan, we need the initiative of professional society and endorsement from government to train medical officer from the rural areas, provide them with a structured training which should be uniform across the country. Health managers need to be appointed to oversee these programs to ensure quality and safety in provision of safe obstetric anesthesia across the country

REFERENCES

1. Mavalankar D, Sriram V. Provision of anaesthesia services for emergency obstetric care through task shifting in South Asia. *Reprod Health Matters*. 2009;17(33):21-31. doi: 10.1016/S0968-8080(09)33433-3. [PubMed]
2. Ronsmans C, Graham WJ. Maternal mortality: who, when, where, and why. *Lancet*. 2006 Sep 30;368(9542):1189-200. [PubMed]
3. World Health Organization. MDG 5: improve maternal health. [Cited on December 28, 2014]. Available from URL: http://www.who.int/topics/millennium_development_goals/maternal_health/en/
4. Trends in Maternal Mortality: 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division. [Cited on December 28, 2014]. Available from URL: http://apps.who.int/iris/bitstream/10665/112682/2/9789241507226_eng.pdf
5. Ministry of Planning, Development and Reform. Government of Pakistan. Pakistan Millennium Development Goals Report 2013. [Cited on October 20, 2014]. Available from URL: <http://www.undp.org/content/dam/pakistan/docs/MDGs/MDG2013Report/UNDP-Report13.pdf>
6. Butt MA. Women's Health Problems in Pakistan. *Middle East J Fam Med*. 2004;2(2):1-17
7. PAKISTAN: Special report on maternal mortality. Pakistan: Human Development Foundation; 2004. [Cited on December 08, 2014]. Available from URL: http://www.yespakistan.com/wellness/maternal_mortality.asp
8. Islam MT, Haque YA, Waxman R, Bhuiyan AB. Implementation of emergency obstetric care training in Bangladesh: lessons learned. *Reprod Health Matters*. 2006 May;14(27):61-72. [PubMed]
9. Mavalankar D. Policy Barriers Preventing Access to Emergency Obstetric Care in Rural India. Working Paper Series. Ahmedabad: Indian Institute of Management, 2004.
10. Lertakyamane J, Tritrakarn T. Anaesthesia manpower shortage in Asia. *World Anaesth*. 1999;3(1):8
11. American Association of Nurse Anesthetists. History of Nurse Anesthetist Practice. At: <www.aana.com>. Accessed January 2016.
12. Population by Sex, Sex Ratio, Average Household Size and Growth Rate. Islamabad: Ministry of Economic Affairs and Statistics, 1998. At: <www.statpak.gov.pk/depts/pco/statistics/pop_sex_ratio_growth_rate/pop_sex_ratio_growth_rate.html>. Accessed January 2016.
13. Sultan ST. Emergency Obstetric Care--Delegating Anesthesia Services. Averting Maternal Death and Disability Program, Columbia University. Undated. At: <www.amdd.hs.columbia.edu/docs/Sultan.ppt>. Accessed January 2016.
14. UNICEF. Networking to Reduce Maternal and Neonatal Mortality in South Asia. CD-ROM. New Delhi: 6-8 June 2009.
15. Adkoli BV. Migration of health workers: perspectives from Bangladesh, India, Nepal, Pakistan and Sri Lanka. *Regional Health Forum*. 2006;10(1):49-58.
16. Task shifting: rational redistribution of tasks among health workforce teams: global recommendations and guidelines. Geneva: World Health Organization, 2008.
17. McPake B, Mensah K. Task shifting in health care in resource-poor countries. *Lancet*. 2008 Sep 13;372(9642):870-71. [PubMed]
18. Mid-level health workers: the state of the evidence on programmes, activities, costs and impact on health outcomes: a literature review. Geneva: World Health Organization, 2008.
19. M&M Associates. Nepal Safer Motherhood Project: evaluation of performance of anaesthesia assistants in Nepal. Undated. At: <www.nsmf.org/publications_reports/documents/Evaluationof_Performance_of_Anesthesia_AssistantofNepal.pdf>. Accessed January 2016.
20. Dobson MB. Anaesthesia at the District Hospital. 2nd ed. Geneva: World Health Organization, 2000.
21. Kowalewski M, Jahn A. Health professionals for maternity services: experiences on covering the population with quality maternity care. *Safe Motherhood Strategies: A Review of the Evidence*. Studies in Health Services Organisation and Policy 2001;17:139.
22. Pine M, Holt KD, Lou YB. Surgical mortality and type of anesthesia provider. *AANA J*. 2003 Apr;71(2):109-16. [PubMed]
23. Simonson DC, Ahem MM, Hendryx MS. Anesthesia staffing and anesthetic complications during cesarian delivery: a retrospective analysis. *Nurs Res*. 2007 Jan-Feb;56(1):9-17. [PubMed]
24. United Nations Population Fund. Population, health and socioeconomic indicators. Available at;. Accessed January 2016.
25. Medical Council of India, Specialty and Super Specialty Courses. Available at: www.mciindia.org/apps/search/show_colleges.asp. (Accessed on January 2016)
26. Caro D, Murray S, Putney P. Evaluation of the Averting Maternal Death and Disability program. Bethesda, MD: Cultural Practice, 2004.
27. Nick Simons Institute. At: <www.nsi.edu.nplaa.php>. Accessed 9 December 2008.
28. Seneviratne HR, Rajapaksa LC. Safe motherhood in Sri Lanka: a 100-year march. *Int J Gynaecol and Obstet*. 2000 Jul;70(1):113-24. [PubMed]
29. Operational Plan for Training MBBS Doctors for Life Saving Anesthetic Skills. New Delhi: Ministry of Health and Family Welfare, 2002. At: <http://mohfw.nic.in/NRHM/MH/Life_saving_Obstetric_Care_Log_Book_for_Trainers.pdf>. Accessed January 2016.
30. McPake B, Mensah K. Task shifting in health care in resource-poor countries. *Lancet*. 2008 Sep 13;372(9462):870-71. doi: 10.1016/S0140-6736(08)61375-6. [PubMed]
31. Hodges SC, Mijumbi C, Okello M, McCormick B, Walker IA, Wilson IH. Anaesthesia services in developing countries: defining the problems. *Anaesthesia*. 2007 Jan;62(1):4-11. [PubMed]

