

NEONATAL SURGERY IN CHITTAGONG MEDICAL COLLEGE HOSPITAL

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Eda J. Le Shan said “A new baby is like the beginning of all things-wonder, hope, a dream of possibilities” [1]. But when a baby is born with a congenital anomaly or suffers from a life threatening morbidity, a cloud of sadness covers the rays of hope surrounding it. Approximately 85% of the children may present with a surgical condition at least once during childhood [2]. Congenital malformations attribute to 1.6 % of the total global burden of disease, half of which could be surgically corrected [3,4].

As the pediatric surgeons have the advanced education and skills necessary to perform surgery on neonates, infants and very young children, ever since I decided to become a pediatric surgeon, my dream had been to bring happiness to the surgical children. Over the last 23 years I worked hard to improve the quality of service and to improve the outcome of management of these children. Pediatric Surgery was established in Chittagong Medical College Hospital (CMCH) in 1993 with only 3 pediatric surgeons having 5 beds in each surgical ward. It has now escalated to 55 beds with 10 pediatric surgeons and many trainees. In 2015, 6141 patients were admitted in department of pediatric surgery, CMCH and 2457 operations were done. Time has now come to focus on the subspecialty of pediatric surgery.

Neonatal surgery is an integral part of pediatric surgery which always needs special attention. Neonatal surgery involves surgery on neonates up to 28 days old, weight 2500 gm or less and requires care in NICU following surgery irrespective of weight. Neonatal surgery emerged in the 1930s and 1940s in restricted regional centers of the world and galvanized into a bona fide pediatric surgical subspecialty during the 1950s, led by those children's hospitals that developed neonatal surgical units and training centers [5]. The first neonatal surgical intensive care unit was set

up by Rickham in Liverpool in 1953 [6]. A neonatal surgical unit should handle 50-60 neonates with surgical problems per year, perform minimum 25-30 neonatal surgical procedures per year, individual pediatric surgeon should perform at least 15 neonatal surgery per year and neonates should have access to NICU. Neonatologists, neonatal nurses and anesthetists are important component of neonatal surgical care and a neonatal surgical center should share knowledge, respect experience and share care among them and many others like lab staff, radiologists, dietitians, family support team and many others. Support of the family is essential for neonatal care which comprises of bonding from the start, physical contact of mother with baby as much as possible, involvement of parents in care – feeding, washing and frequent and understandable explanations from medical/nursing staff. Singapore, Hong Kong, Korea, and Taiwan recently have built neonatal surgical centers where high-quality care and training is offered [5].

In our department, in 2015, we performed 230 neonatal operations with a mortality rate of 31% [Fig 1]. The most common neonatal surgical conditions we treated were anorectal malformations, Hirschsprung disease, gastroschisis, omphalocele, necrotizing enterocolitis, intestinal atresia, malrotation, meconium ileus, biliary atresia, posterior urethral valve, bladder exstrophy, cloacal exstrophy and congenital diaphragmatic hernia. In Dhaka Medical College Hospital the neonatal mortality rate was 10.61% from 2001 to 2009 in 650 admitted neonates [7]. A nationwide survey on neonatal surgery conducted by the Japanese Society of Pediatric Surgeons showed that the overall mortality rate for newborns having surgery had improved from 32% in 1968 to 9.0% in 2003 in Japan [8]. The mortality rate for the surgical neonates ranged from 5% to 16%, and sepsis (as high as 80%) was the major contributor to mortality in Wadia Children’s Hospital, Mumbai [9]. In Africa, Neonatal surgical mortality rate were 36.9% from 1995 to 2004 and 29.1% from 2005

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to 2014 [10]. In 1949 the overall mortality of neonatal surgery was 72%, leading Peter Rickham to state that “except in the hands of a very few, very expert surgeons, operating on a small number of highly selected cases, the mortality for major operative procedures was forbiddingly high.” [11]. Over the last 6 decades there has been a striking reduction in mortality [11]. The reasons were the growth of pediatric surgery and widespread availability of neonatal surgeons, parallel growth of pediatric anesthesia, understanding neonatal physiology is the key to successful management, new inventions which revolutionized patient care, the development of CPAP (continuous positive airway pressure) and a continuous flow ventilator which allowed safe ventilatory support (neonatal mechanical ventilation which had a prohibitive mortality and was seldom utilized), total parenteral nutrition, effective treatment of infection and establishment of newborn intensive care units [11]. There has also been a significant reduction in premature deaths, particularly in infants below 1,000 g [11].

In developing countries, on the other hand, anesthetic mortality has not declined during the last 50 years [12]. When the most fragile neonates present for major surgery under dire circumstances, the pediatric surgeon may face the alternatives of performing major surgery without general anesthesia, or to do no surgery at all. Although usually not considered standard of care in high-income countries, a large number of neonatal surgeries are performed with local infiltrative anesthesia alone in resource-limited settings [13-16]. Between June 2008 and December 2011, 720 neonates were admitted for major surgery in our department and 21.1 % of them died pre-operatively. Five hundred and sixty eight neonates underwent major surgery, of which 216 (38.0 %) were operated under local infiltrative anesthesia. Sigmoid colostomy was the most commonly performed procedure (37.5%), followed by exploratory laparotomy with bowel resection and anastomosis (21.3 %), and anoplasty (18.1 %). In-hospital postoperative mortality rate after procedures in local anesthesia was 10.6 % (23/216), and death occurred at a median of 6 days after the procedure [17]. In-hospital mortality was 11.4 % among the neonates selected for general anesthesia but in our experience general anesthesia carries a considerably higher mortality

for the most critically ill neonates in our settings. The most vulnerable were premature, low birth weight babies whose disease had progressed several days before operation. A postoperative mortality rate of about 10 % among the most fragile neonates lend some support to the local anesthesia approach as a relatively safe and viable option for these very sick neonates.

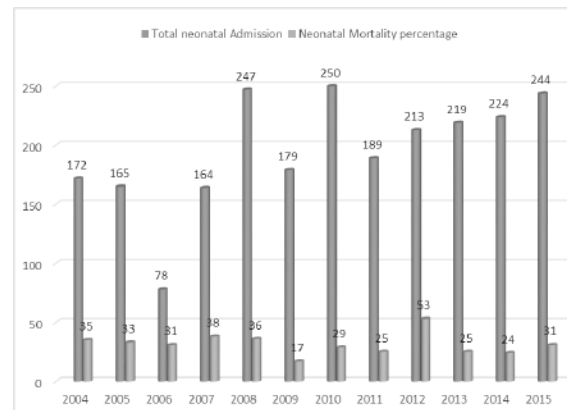


Fig 1 : Neonatal admissions and mortality rate in our department

A 10-year retrospective review of 154 neonates undergoing emergency surgery in Nigeria showed that 44 patients (28.6 %) were operated with local anesthesia, of which 7 patients (15.9 %) required conversion to general anesthesia [16]. In a multicenter study from surgical centers in Uganda, only 13 % of anesthesia providers were able to provide basic requirements for safe anesthesia for children [18]. Thus the pediatric perioperative reality is greatly different in resource limited setting compared to a high-income country and the local anesthesia practice can be seen as a symptomatic response of a system which cannot provide adequate neonatal intensive care service. The Lancet Commission on Global Surgery addressed anesthetic safety as a global concern and we have to work hard to implement and improve pediatric and neonatal anesthesia to a safer level [19].

The major causes of neonatal surgical mortality in the world are now complications of premature, uncorrectable abnormalities of the heart, lungs, kidney, and central nervous system, inborn errors of metabolism, and infection [11]. The major challenges we face are delayed presentation and inadequate facilities, dearth of trained support

personnel and absence of neonatal intensive care. Our experience showed that the reasons behind high neonatal surgical mortality rate in our center are overload of patients, lack of antenatal screening facilities, limited access to hospital delivery, late diagnosis and delayed transfer, lack of neonatologist and pediatric anesthesiologist, nurse & supportive staff, scarcity of NICU beds, TPN facilities and fluid monitoring. Investment in neonatal surgery, proper antenatal care and antenatal diagnosis and special attention from the Government, UNICEF, WHO and other funding agencies is necessary to improve the scenario. Good lab facility for 24 hours, exchange of knowledge & experiences, development of pediatric surgical sub specialty, innovative technique, manpower development, and logistic support is also necessary.

Acknowledgement

DR M A Mushfiqur Rahman, Assistant Professor of Pediatric Surgery, Dr Tanvir Kabir Chowdhury, Assistant Professor of Pediatric Surgery, Dr. Adnan Walid, Resident MS student, Pediatric Surgery, Chittagong Medical College, Chittagong.

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