Treatment of congenital anomalies in a missionary hospital in Bangladesh: results of 17 paediatric surgical missions

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Abstract. *Background and aim of the work:* We report 17 years of experience in a missionary hospital with decreased facilities in Bangladesh. Our interest was directed at children with congenital malformations since they live in a society where the exclusion of abnormal children is common. A better treatment for these children offers them a better future. *Materials and methods*: Bangladesh is among the most densely populated countries in the world: its population ranges from 142 to 159 million, and it is one of the poorest nations in the world. From 1991 to 2008 our Italian pediatric surgical team performed 17 5 weeks missions in a missionary hospital in Khulna, Bangladesh, during the months of January and February. *Results:* A total of 1556 patients underwent surgery, mostly for severe congenital anomalies. The infection rates were very low: 2-3%; the mortality rate was 0,4% for all the operations. *Conclusions:* Good pre-operative preparation and assistance, assurance of cyclical follow-up and a trained surgical team allowed the successful treatment of complex malformations in a missionary hospital with modest services. (www.actabiomedica.it)

Key words: Bangladesh, paediatric surgery, humanitarian mission

Introduction

Bangladesh is one of the poorest countries in the world with a population of more than 142 million people, living in a territory that is less than one-half the size of Italy. The total fertility rate is now 3.1 children per woman, compared to 6.2 of three decades ago. The population is relatively young, with the 0–25 age group comprising 60%, while 3% are 65 or older. Life expectancy is 63 years for both males and females (1). The maternal death ratio is still high with over 300 deaths per 100,000 live births. Most Bangladeshis are rural, living on subsistence farming. Nearly half of the population lives with less than 1 USD per day.

Many health problems are present, ranging from surface water contamination, to groundwater arsenic contamination, and diseases including malaria, leptospirosis and dengue.

The mortality rate under 5 years of age is 77 deaths per 1000 live-births (89 per 1000 in 2005), while in Italy the ratio is 5:1000; some of the most common causes of death are diarrhoeal diseases, due to the lack of access to clean water, and pneumonia. Among the neonatal causes of death are tetanus, due to the local practice of placing cow manure on the newborn umbilical stump (2), and congenital anomalies.

There are not many underfed children but malnutrition is common because the usual diet is based on rice and vegetables with a lack of proteins. Fourty-eight per cent of children under five yrs. Of age are underweight, 78 per cent of infants are anaemic, and 49 per cent of women are anemic.

Low birth weight and malnourished children are susceptible to infections; roughly two-thirds of deaths of children under five yrs. of age are due to malnutrition (3).

Diseases which could be prevented by vaccinations kill tens of thousands of children under the age of five, these include diphtheria, pertussis, tetanus, tuberculosis and measles.

New and old infectious diseases, such as malaria, tuberculosis and acquired immunodeficiency syndrome (AIDS) are important threats to health for the years ahead. The emergence of drug resistant malaria and tuberculosis further increases the risk. Medical resources are scarce, with one physician available for every 5.000 people (in Italy 1:180) and hospital beds 1:3500 (in Italy 1:150).

The Dhaka Shishu Hospital is the only pediatric hospital in the country, performing approximately 1000 operations each year. Since pediatric surgery is not developed in Bangladesh, many children die at birth from congenital malformations and most of those who survive live with their anomalies.

Patients with important malformations such as ano-rectal, intestinal, urological and genital malformations, are referred to the pediatric surgery of Calcutta in India; where the parents are charged from 1000 to 2000 american dollars for the surgery, an enormous sum for a bengali family, whose daily income is 1-2 dollars. The illness of a child is a catastrophic event that forces a family into debt for several years. It is not rare to meet families that sold all their properties to pay the hospital bill for the cure of a congenital anomaly of their child. The missionary hospital Santa Maria Sick Assistance has been built for the treatment of congenital anomalies and for 8 months a year, from september to april different teams of plastic surgeons, maxillo-facial surgeons, orthopedic surgeons, pediatric surgeons, adult-general surgeons, and urologists alternate to repair congenital anomalies in the different fields of competence. During the summer, from may to september, the temperature exceeds 40° c. The high humidity and daily rain makes the situation unsuitable for delicate surgery, since working in a non-air-conditioned environment increases the potential risk of wound infection.

During the summer the hospital becomes a shelter run by the local nuns.

Materials and methods

Sponsored by a non governative organization and with the help of the University Hospital of Parma, from 1991 to 2008 an Italian pediatric surgical team performed 17 missions of 5 weeks each in a missionary hospital in Khulna, Bangladesh. Our team consisted in 3 surgeons (one of them is a resident), 2 anesthesiologists, 4 nurses, and sometimes a pediatrician.

The chief surgeon, chief anesthesiologist and head nurse were the same for all missions. The hospital had 70 beds and 2 operating rooms. It was built with the financial help of the Italian Red Cross.

The missions of our team lasted for a period of 5 weeks during the months of January-February, when the temperature does not exceed 25-28°C during the day and 10-14°C during the night.

Most of the surgical materials and the anaesthesia machines were brought from Italy. Oxygen and nitrous oxide were available in tanks. The basic needs of an operating room were provided. In the operating room the oxygen saturation level was monitored. Several children were operated without any blood screening.

Children with complex anomalies underwent blood tests, and a technician from a private laboratory was available to take blood samples every morning.

Blood was made available if a transfusion was needed. Ultrasound and radiology studies were performed in private facilities. Presently an ultrasound machine is available in the hospital. Regarding the anaesthesia, local-regional anaesthesia plus sedation, when possible, was the preferred method. General anaesthesia with a catheter inserted into the peridural space was used for important operations, with laparotomy. The peridural catheter was also used post-operatively for analgesia. A central line, with the puncture of the internal jugular vein, was placed when fasting was needed for several days. All patients with inguinoscrotal disorders received no antibiotic therapy. Antibiotic therapy was started for major surgery. The criterion of choice of antibiotic therapy was the least sophisticated and most available drug at the moment. Three days prior to surgery children with gastrointestinal problems underwent antiparasitic therapy consisting in 100 mg of mebendazole p.o. for 3 days, since widespread ascaris worm infestation is present.

We made efforts to operate on the more serious cases (anorectal malformations, severe urological cases, vaginal atresia, Hirshprung's disease, etc.) in the first weeks of the mission, reserving the less severe cases for the last week. This way we were able to fol-

low the major surgery for weeks and had the possibility and the time to face any complications.

Results

A total of 1556 patients underwent surgery, mostly for severe congenital anomalies.

During each mission about 120 operations were carried out with a single operation cost of nearly 200$.

The continuity of the missions allowed us to obtain follow-up data of all the major malformations, and to observe the great functional or esthetical results of our surgery, similar to those recorded in similar cases in western countries.

The infection rates were very low: 2-3% of all operations.

The mortality rate was 0,4% of all operations (6 of 1556). Four of them died in the postoperative period after laparotomy for terminal cancer or for terminal intestinal tuberculosis. One child, 8 years old, died in the 5th postoperative day after a splenectomy for talassemia major.

Discussion

From our first mission our philosophy regarding operations was directed at children with congenital anomalies for whom a better future would be provided. We excluded emergencies because we were fully occupied with elective surgery and the organization of our hospital could not provide nursing assistance for these cases. We thought it was not useful to provide emergency surgery for one month, after which the children with severe malformations would have continued to die for the lack of assistance. In spite of severe malnutrition and limited diagnostic studies, the use of basic instruments and solid surgical principles permitted satisfactory results, quite unexpected, when we started our first mission. There are few reports of missions with our experience in developing countries. Our mission shows that in certain conditions any kind of paediatric surgery is possible. Good results were obtained even with less sophisticated drugs. Excellent wound healing was observed, with very few wound infections, probably due to the slim but tenacious anatomic structure of this population.

Table 1. Types of surgical procedures performed in the 17 missions

Anorectal malformations	134
Vaginal atresia	41
Abdominal surgery	148
Hirshprung's disease	37
Hypospadias	288
Epispadias	48
Urological disorders	243
Posterior urethral trauma	47
Inguinal canal disease	260
Tumors	47
Thoracotomy	8
Labiopalatoschisis	60
Myelomeningocele	4
Miscellaneous	191

Children presenting with large inguinal hernias, some of which containing long portions of bowel, or large hydroceles were not able to walk normally. These patients, when properly treated, may obtain a normal life in a society where social exclusion of the abnormal is common and can have catastrophic consequences. Children with congenital deformities, some cosmetically visible such as cleft lip or palate and others that are less visible such as anorectal malformations, hypospadias, or epispadias, will find it almost impossible to marry unless the anomaly is repaired.

Living in an agricultural society, it is common for husband and wife to work together to maintain a family, and therefore, without a mate life becomes very unpleasant and difficult (4).

Burns are very frequent among Bengali children; most of them occur inside the small and uncomfortable huts, where it is common to find ten or more people living in a 10 m. square area. The lack of or expense of antibiotics and the scarcity of adequate plastic surgical treatment makes burns responsible for high mortality and devastating scar retractions.

Plastic surgeons were involved in the treatment of these lesions.

After our first mission in which all the general paediatric surgery was performed, in the following missions we encountered a dramatic improvement of the major surgery, including male and female anorectal malformations, cloacas, Hirshprung's disease, hy-

pospadias, and epispadias. Bladder extrophy, an anomaly that is repaired during the first days of life in western countries, was observed even in adolescent boys and girls.

Forty male patients arrived to our attention for posterior urethral trauma. These lesions may become devastating for men that are occupied in agriculture, and living in a small rural village. All the patients arrived at our hospital with a sovrapubic catheter and after multiple stages of operations it was possible to reestablish an urethral continuity.

Forty-one girls were treated with a vaginal colon replacement for congenital absence of the vagina (Rokitansky syndrome). All the patients discovered the anomaly late in life at an average age of 18.4 years. In Bangladesh, society concerns about the absence of menstruation seems to start during marriage arrangements, or it can become dramatically evident after marriage. In these circumstances the woman may expect a miserable future. She is often abandoned by the original family. Luckily in great contrast to this behaviour, 9 out of 41 got married, began a satisfactory sexual life after vaginal replacement and 5 of them even adopted children. This social behaviour is revolutionary in Bangladesh, where husbands may abandon a wife for even minor vaginal problems (5, 6).

One hundred and thirty four anorectal malformations were treated, all the male patients arrived to our observation with a colostomy performed in Bangladesh or in India. After we finished the anorectal repair, when the children were cleared, the parents were taught how to dilate the new anus with hegar dilators provided by us, and the following year the colostomy was closed. All these patients with imperforated anus come for a check-up every year, so we can collect all the information regarding the function and the continence. Girls suffering from anorectal malformations (cloacas, rectovaginal fistulas, rectovestibular fistulas) in most cases presented to our care without a colostomy. All the female patients underwent perineal repair with a protective colostomy performed on the same day. As for the male patients, the girls went home with a strict program of dilatations, and the colostomy was closed the following year.

The credibility reached among the local people and the continuity of the missions created the basis for the successful treatment of important anomalies, important even in the most sophisticated western hospitals.

Conclusions

Besides the humanitarian significance of these surgical missions, it is also very compelling for a western surgeon to observe the natural evolution of untreated congenital malformations. Our experience shows flexibility in successfully treating patients with complex congenital anomalies in Bangladesh, and in guaranteeing adequate and cyclic follow-up as well as a trained surgical team during the operation.

Children are certainly helped by the treatment provided, and enormous satisfaction is experienced in aiding this desperate population for whom it was previously impossible to receive this kind of treatment.

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