MANAGEMENT OF A CLINICAL AND SURGICAL CENTRE IN RURAL CAMBODIA (2006-2011)

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SUMMARY. The activities of the Bambino Gesù Paediatric Clinical and Surgical Centre Takeo in Cambodia started in May 2006, after the signature of a formal agreement between the Royal Government of Cambodia and the hospital. The paediatric centre is currently composed of an out-patients section with diagnostic ultrasound facilities and an obstetrics and gynaecology section, 3 consulting rooms, 20 beds for clinical activities, 13 beds for surgery, 7 beds for the paediatric intensive care unit, 2 dressing rooms, 1 out-patients sterile section, a library for off- and on-line consultation, a playroom and laundry facilities, and an administration office. For the last five years its activity has neen steadily on the increase, and the local population are beginning to look on the Centre as a full-scale local and regional referral hospital. From the 190 cases handled in 2006, the Centre increased to 669 surgical procedures in 2010 and 341 in the first four months of 2011, with good prospects of exceeding 1000 operations before the end of 2012. Takeo Centre also developed a Mobile Clinic Project to assist children directly in rural areas lacking health facilities. Today the Centre is a new reality in Cambodia's healthcare system.

Keywords: Cambodia, healthcare, epidemiology, Takeo Hospital

Introduction

Despite a persistently alarming economic situation with a per capita income of less than $300/year, Cambodia has made significant progress in social development over the last five years. Life expectancy at birth has increased from 52 to 60 years for men and from 56 to 65 years for women, mainly due to rapidly declining infant and child mortality (*Table I*). Between 2000 and 2005, the infant and under-5 mortality rates were reduced from 96 to 66 and from 124 to 83 deaths per 1,000 live births respectively, and the country is likely to meet the four targets of the Cambodian Millennium Development Goals (CMDGs). This is mainly due to increases in exclusive breast feeding from 11% in 2000 to 66% in 2008 and to improvements in immunization coverage and social determinants of health including poverty reduction, improved education, and better infrastructure.

Nonetheless, Cambodia still faces major challenges in several areas in order to achieve the CMDGs. These include the urgent need to reduce the high maternal mortality rate of 461 deaths per 100,000 live births and is among the highest in the region. Moreover, findings from the Cambodia Anthropometric Survey 2008 reveal that the percentage of children classified as acutely malnourished ("wasted") and underweight has remained largely unchanged since 2005. The survey also found that wasting among underprivileged urban children increased from 9.6% in 2005 to 15.9% in 2008. Cambodia remains one of the 33 "alarming or extremely alarming" countries in terms of hunger and undernutrition. Nutritional programmes targeting pregnant/nursing women and young children will need to be strengthened if the gains made since the late 1990s are to be maintained. Significant inequities also persist between rural and urban areas, across provinces and between people with different educational levels and economic status. Living condition differences are large between urban and rural areas. The standard of living is better in urban areas, especially in Phnom Penh. There is also a need to strengthen national capacities for health stewardship, in particular human resources management, service delivery, financing, and governance. According to the Cambodia So-

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cio-Economic Survey 2004, about 18% of the population experience monthly some illnesses, injuries, or other health-related symptoms. Illness rates are highest among children under age 5 (25%) and are lowest among teenagers. From age 20 the rates rise steadily to over 40% among the oldest (age 65+), rates being slightly higher for women. Among children under 5 years of age 20% develop symptoms of acute respiratory tract infection, the primary cause of morbidity and mortality, and 19% have diarrhoea and dengue fever. In recent years several dengue fever epidemics have been reported in Cambodia.[1] Dengue fever, unless it is haemorrhagic (0.8%), rarely causes death. There is no vaccine or specific drug treatment for this disease; intravenous fluids are administered to maintain adequate homeostasis.

Table I - Causes of death among children under 5 in Cambodia

Neonatal causes (%)	29.8 (WHS 2007)*
HIV/AIDS (%)	2.0 (WHS 2007)*
Diarrhoeal diseases (%)	16.6 (WHS 2007)*
Measles (%)	2.3 (WHS 2007)*
Malaria (%)	0.9 (WHS 2007)*
Pneumonia (%)	20.6 (WHS 2007)*
Injuries (%)	1.7 (WHS 2007)*
Other causes (%)	26.1 (WHS 2007)*

* Source: World Health Survey (WHS) 2007

The purpose of this paper is to overview the activities from August 2006 to April 2011 of the Bambino Gesù Paediatric Clinical and Surgical Centre Takeo, now recognized as a leading best-practice example serving a rural Cambodian province and to illustrate its current and future projects.

Strategy and commitment

The activities of the Centre started after the signature of a formal agreement between the Royal Government of Cambodia and the Bambino Gesù Paediatric Hospital (BGPH) in Rome in May 2006.

Initially, repeated missions from the main hospital in Italy (BGPH) were undertaken to upgrade existing infrastructures in Takeo Province (including the Paediatric Ward in Takeo Referral Hospital). The missions provided all the necessary medical equipment, medicines, linen, furniture, and medical supplies needed for the inception of the clinical and surgical practice. All technologies required in the paediatric sub-intensive care unit (PICU), the operating theatre, and the consulting rooms were also provided.

Since expanding its capacity, the paediatric centre has consisted is currently composed of an out-patients department with diagnostic ultrasound and an obstetrics and gynaecology service, 3 consultation rooms, 20 beds for clinical activities, 13 beds for surgery, 7 beds for the PICU, 2 dressing rooms, 1 operating block (1 operating theatre, sterilization), 1 library for off- and on-line consultation, a playroom, laundry facilities, and an administration office.

The financial resources allocated and actually spent between 2006 and April 2011 amounted to $US 1,867,534.29, between medical equipment ($US 723,498.40), running costs ($US 271,208.22), renovations and maintenance costs ($US 253,028.70), clinical and surgical costs for indigent patients ($US 207,837.44), expenses of visiting doctors from Italy ($US 81,901.69), staff training ($US 8,806.94), and communication and visibility ($US 4,154.00) (*Table II*).

Table II - The Takeo Centre Budget

Budget 2006 - April 2011	US$	
Medical equipment	723,498.40	47%
Running costs	271,208.22	18%
Renovations and maintenance costs	253,028.57	16%
Clinical and surgical costs for indigent patients	207,837.44	13%
Expenses of visting doctors from Italy	81,901.69	5%
Staff training	8,806.94	0.5%
Communication and visibility	4,154.00	0.2%
Total	1,867,534.29	

Clinical and surgical achievements

During the period of 2006 - April 2011 clinical and surgical activities involved as many as 2744 children under 3 years of age out of a total number of 6860 patients. The distribution of the different conditions and diseases treated is shown in *Table III*.

Table III - Distribution of diseases

Pathologies	Number of cases	
Respiratory tract infections	2231	33%
Dengue, haemorrhagic fever, dengue, shock syndrome	1759	26%
Intestinal disorders	994	14%
Neonatal asphyxia	264	4%
Meningitis, Japanese fever	209	3%
Malaria	141	2%
Severe malnutrition	101	1,4%
HIV/AIDS	69	1%
Others (e.g. typhoid fever, tetanus, nephrotoxic syndrome)	1092	16%
Total	6860	

Since the construction of the operating room in August 2006, 2164 surgical operations have been performed in our Centre with an average of 500 operations per year (*Table IV*). Over the years, an increasing number of operations have been performed by orthopaedic surgeons and ophthalmologists in the centre, accumulatively amounting to 16% of the overall number. Ear, nose and throat surgery is also a substantial part of the BGPH'S commitment to treating disadvantaged children. In addition there has beener commitment in providing specialized surgery, including urology surgery that accounted for about 2% of the total.

Table IV and *Fig. IV* indicate that 45% of the total interventions were general surgical procedures, compared with 32% in reconstructive surgery. The total interventions were often of moderate complexity, while surgical interventions aimed at improving anatomical and functional improvement were often complex and time-consuming.

Table IV - Distribution of surgical cases

Surgical activities	Number of cases
General surgery	983
Plastic and reconstructive surgery	687
Orthopaedic surgery	183
Ear, nose and throat surgery	179
Ophthalmology surgery	36
Urology surgery	11
Others	85
Total	2164

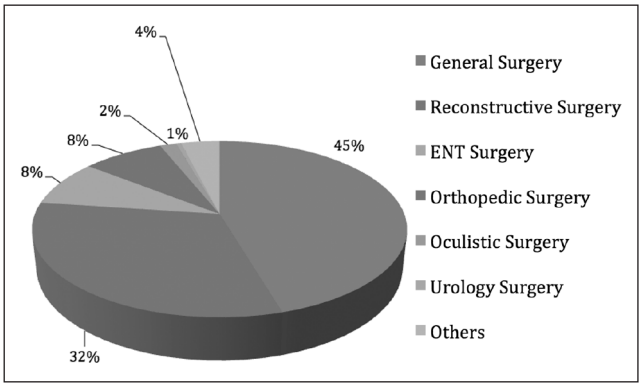

Fig. 1 - Distribution of surgical cases.

Reconstructive surgery was for the head and neck (congenital malformations such as cleft lip and palate, burns, release of severe contractures), urological malformations (hypospadias, urinary bladder reflux, and other urinary tract malformations), hand surgery (syndactyly, camptodactyly, burn contractures), and trauma surgery (*Fig. 3*).

Burns remain one of the most important causes of injury in this country. Free flame, gas stoves, oil lamps, and the high number of still remaining land mines are frequent causes of children's burns. Acid attacks on women and young men are very common for reasons of jealousy or revenge.

There is no specialized burns centre in the territory and burns sequelae are often dramatic as a result of inadequate care and the general tendency of the population to develop keloids.

A study[3] published in 2004 by one of the present authors considered the question of whole person impairment, which rates five classes of skin damage, ranging from 0 to 95% impairment. This scale sets up five classes of increasingly severe skin disorders and disabilities in everyday life due to the scars, which are described here. We also considered the aetiology and the general parameters of the patients' injuries.

In Cambodia some 20,000 burn injuries occur every year, almost two-thirds of them involving children under 10 years of age (accurate epidemiological data on burns are not available in this country).

One hundred and sixteen children with significant burns sequelae have been treated at the Takeo Centre, with scars mainly affecting the limbs and the neck, with involvement also of the axilla, hands, elbow, and knee. We also assisted a large number of young women with serious facial in the face due to the criminal use of acid for sentimental reasons.

The surgeons' wide experience use of the most effective technique in each case, e.g. Z-plasties, skin expansion, skin grafting, and local or distant pedicled cutaneous or myocutaneous flaps. However, owing to Cambodia's lack of technology, simple but most effective techniques were preferably used.

Fig. 2 - Increase in number of surgical procedures performed at the Takeo Centre (2011 - Jan.-April).

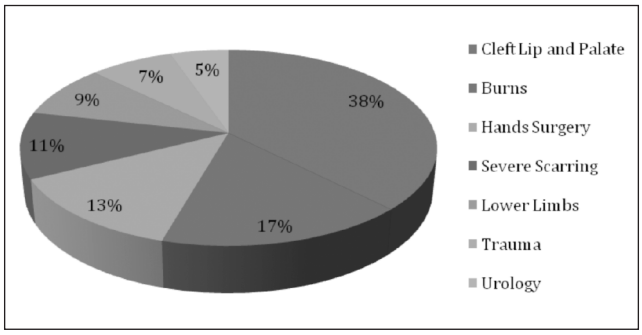

Fig. 3 - Total plastic surgery operations.

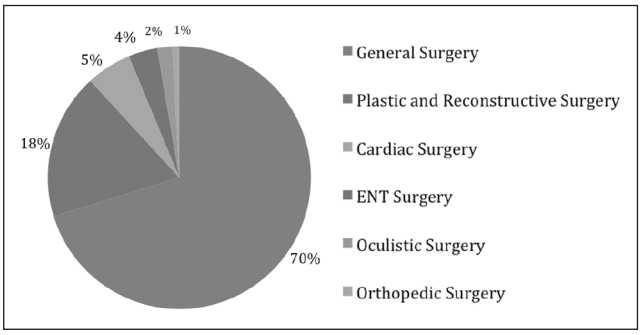

Fig. 4 - Distribution of surgical cases: Mobile Clinic Project.

In our practice we laid great stress on post-operative care with physiotherapy, elastic compression, and massages to improve the final results.

Sometimes children with severe burn scar contractures of the limbs, with bone deformities particularly of the radius and hands, needed to be operated on and, in these few cases, alteration of the growing bones was observed. Physiotherapy played a leading role in post-operative care.

Since most burns in rural areas are accidental and occur in the home setting and are therefore preventable, an effective paediatric burn prevention campaign is currently being considered.

Together with surgical activities, the BGPH's commitment to treating pathological cases has been constant, and performed with increasing efficiency and effectiveness year by year.

Finally, as a result of the successful implementation of the Pilot Project for a Mobile Clinic, BGPH is expanding its coverage and area of intervention and has now committed itself to a broader set of complementary health-related activities including:

– *Providing maternal health services to vulnerable pregnant women.* Recent studies show that up to 80% of Cambodian women have deliveries outdide health care facilities and only 37% of pregnant women deliver with the assistance of a skilled birth attendant. There is also an alarming decrease in the number of midwives in remote areas. All this clearly increases the maternal mortality rate and reduces the chances of survival through early childhood of the children whose mothers do not survive delivery. We expect that in a period of two years almost 240 vulnerable pregnant women will receive psychological counselling and free access to high-quality medical care.
– *Improving the capacity of existing health centres in remote areas* through mobile clinics, mobile pharmacies, and community training on hygiene practices. Despite the fact that over 85% of the population live in rural areas, most hospitals and health personnel are concentrated in urban areas, resulting in an unequal distribution of health care for Cambodians.

In one year (2010-2011) over 5,500 children received free clinical and surgical consultation, 350 were admitted to the Centre for medical and surgical assistance, and 60 rural communities had training and seminars in basic health.

702 patients were treated free of charge by the Mobile Clinic Project:

- 201 patients > 5 years old
- 369 patients 5-13 years old
- 132 patients > 14 years old

Discussion

In our retrospective analysis of 200 severe post-burn cases treated during a mission in rural Cambodia, published in 2005, we demonstrated that it was possible to obtain results equivalent to those of modern, well-equipped medical structures even in low- and middle-income countries. Such missions have provided over the years countless clues on methodologies, techniques, and capacities required for effective diagnosis and therapy of vulnerable and indigent populations.

The positive feedback laid the foundations for the creation in 2006, thanks mainly to the support from the Ospedale Pediatrico Bambino Gesù of Rome, of the Pediatric Clinical and Surgical Centre, recognized now as a leading of the best-practice example serving Takeo Province.

The work of all the staff at the Centre has always sought inspiration from a patient-centred approach and made humanitarian medicine a crucial aspect its actions.

One of the main goals has clearly always been to encourage improvement of the skills and expertise of the local staffin order to create a structure that can function autonomously and ensure long-erm sustainability and ownership.

The highest costs that our Hospital has to face are those of the visiting staff involved in the programmme such as travel and accommodation expenses, plus logistic expenses.

To achieve this it is also crucial to provide e-learning opportunities through conventional and electronic libraries.

Conclusion

This paper testifies to the continued growth of structures operating in the developing countries (Takeo Province is in rural Cambodia) and stresses the importance of providing high-quality medical care to paediatric patients, above all to those who are experiencing dramatic socioeconomic conditions. It also stresses the importance of providing solutions that comply with and adapt perfectly to the patients' needs, following a "patient-centred approach".

The importance of humanitarian action is not only centred in the health sector but contributes to the beneficiary country's social and-economic development. Many thousands of patients will thus be enabled to live their lives well accepted by the society around them without malformations and able to work and to grow and raise a family.

In addition to economic resources and political and institutional support, humanization represents the real engine of these activities and new projects thanks to the cooperation and generosity of donors specifically aimed at helping who are most in need.

RÉSUMÉ. Les activités du Centre Clinique et Chirurgical Takeo Bambino Gesù de pédiatrie clinique et chirurgicale au Cambodge ont commencé en mai 2006 après la signature d'un accord formel entre le Gouvernement Royal du Cambodge et l'hôpital. Actuellement le centre pédiatrique est composé d'un service pour les patients en régime ambulatoire habilité à l'activité diagnostique avec ultrasons, d'un service d'obstétrique et de gynécologie, 3 salles de consultation, 20 lits pour les activités cliniques, 13 lits pour la chirurgie, 7 lits pour les soins intensifs des patients pédiatriques, 2 pour les pansements, une section pour les patients en régime ambulatoire (stérilisation), 1 bibliothèque pour la consultation hors ligne et en ligne, une salle de jeux et une laverie et, enfin, un bureau d'administration. Pendant les cinq années de son existence, l'activité du Centre n'a jamais cessé d'incrémenter, et la population locale commence à se pencher sur le Centre comme un hôpital local et régional de référence à grande échelle. A partir des 190 cas traités en 2006, le Centre est passé à 669 interventions chirurgicales en 2010 et à 341 dans les quatre premiers mois de 2011, et il existe de bonnes perspectives de dépasser le seuil de mille opérations avant la fin de l'année 2012. Le Centre Takeo a également projeté un petit hôpital mobile pour aider directement les enfants dans les zones rurales dépourvues d'équipements de santé. Aujourd'hui, le Centre est une nouvelle réalité dans le système sanitaire cambodgien.

Mots-clés: Cambodge, soins sanitaires, épidémiologie, Hôpital Takeo, procédures chirurgicales

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