Evaluating Key Performance Indicators of Neonatal Surgery Services at a Tertiary Referral Center

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List of Contents

List of Abbreviations

ABP	American board of pediatrics
AHRQ	Agency for health care research and quality
APSA	American Pediatric Surgery Association
BENCH	Benha Children hospital
BSC	Balanced score card
CAPMAS	Central agency for population mass assembly and statistics
CMS	Centers for medicare and medicade
CPAP	Continuous positive airway pressure
CRF's	Case report forms
ECG	Electrocardiogram
EMR	East Mediterranean region
EPSA	Egyptian Pediatric Surgical Association
INICC	International Nosocomial infection control consortium
IOM	Institute of medicine
JCAHCO	Joint commission for accreditation of health care organizations
LMIC's	Low and middle income countries
MOH	Ministry of health
NIBP	Non invasive blood pressure monitor
NICU	Neonatal intensive care unit
OECD	Organization for Economic Co-operation and Development
OR	Operating room

P4P	Pay for performance
PATH	Performance Assessment Tool for quality improvement in Hospitals
RN	Registered nurse , nurse specialist
SMC	Specialized medical centers
SNICU	Surgical Neonatal intensive care unit
SPICU	Surgical pediatric intensive care unit
SpO2	Oxygen saturation in blood
TPN	Total parentral nutrition
USA	United states of America
WHO	World health organization

List of Tables

List of Figures

Abstract

Background: neonatal surgery is a fairly new discipline. Developed countries have achieved an overall mortality rate of less than 5% for most neonatal surgical conditions. Developed countries are still struggling with mortality rates around 40%. This is not due to lack of resources only, but disorganized health care systems are the major contributors to these results.

Materials and methods: a retrospective chart review of 140 surgical neonates treated over a period of one year at a tertiary referral center in Lower Egypt was undertaken to evaluate the quality of service offered (structure, process and outcomes) using validated performance indicators.

Results: compliance with international structure standards was 25%. Process indicators showed either poor compliance or non applicability due to poor design of medical records. Outcomes indicators showed overall mortality rate of 41%, extended lengths of stay and prevalence of multidrug resistant strains in the surgical NICU among others.

Conclusion: health care services offered to surgical neonates need immediate improvement. Reorganization and reform of services focusing on the feasible pathways of improvement might be the way to better service.

Key words: quality improvement, neonatal surgery, performance indicator(s).

Introduction

Neonatal surgery as we know it today was established by Dr William Ladd of Boston, USA in the 1920-30's[1]. Over the past few decades mortality for neonatal surgical conditions has decreased markedly in developed countries. This was not due to operative technical advances but due to a number of extra surgical innovations and inventions. A few of which were the invention of the transistor; the discovery and development of antibiotics and total parentral nutrition[2]. In developing countries, however, surgical neonatal mortality remains high. This is due to multiple factors, some blame poor resources and lack of public interest; others blame disorganization of health care systems and a few put patient risk factors as the primary cause[3-5]. Examination of the quality of service and evaluation of the structure, processes and outcomes of neonatal surgical services provided at a tertiary referral center in Lower Egypt may help in improvement of these services and betterment of outcome.

Aim of Work

Defining the construct of health care services provided to surgical neonates at a tertiary referral center in Egypt.

Identifying key performance indicators that can accurately measure the quality of services provided to surgical neonates.

Identifying significant and independent risk factors influencing outcome.

Comparing local key performance indicators to international benchmarks and identifying gaps of performance.

Performing root cause analysis to identify factors contributing to current results.

Development of informed recommendations that can aid in improvement of services and results.

Review of Literature

Neonatal surgery is a fairly new discipline [1,6]. Though reports of neonates born with congenital anomalies and attempts to rectify them have existed since antiquity (fig1), it wasn't until the second half of the twentieth century that real progress was achieved [2,7]. This was mainly due to advances made in neonatal anesthesia, perinatal care and the introduction of various classes of antibiotics, total parentral nutrition (TPN) and infection prevention measures [2,7]. The early pioneers of pediatric and neonatal surgery at the turn of the 20th century were general surgeons who at one point chose to limit their practice to pediatric patients[1,7].

Figure 1: A case of imperforate anus described in Japanese literature 1840 AD. (1)

Whatever the reasons were for their choice, the discipline of pediatric surgery owes a great deal to those surgeons, especially when considering that at that time a surgeon had to make a livelihood out of his profession and that families often did not have enough money to pay for treatment of their young let alone the expensive surgeons' fees. It is worth mentioning that pediatric surgical patients used to undergo whatever surgery available at that early stage of the 19th and first few decades of the 20th centuries in adult hospitals, indeed even the earliest children's hospitals did not have permanent surgery staff or surgery services at all, and pediatric surgical patients were often referred to adult surgical departments [1].

The first children's hospital of the modern ages was built in Paris, France in 1802 "Hôpital des Enfants Malades", 200 years prior to that children and adults were separated in the hospital of Lyon city by a decree issued by king Louis XIII, a surgeon was appointed to the children named Mosnier . With this milestone in the history of pediatrics in general the road towards the specialty of pediatric surgery was set, for the first time in history children would have a hospital and staff completely devoted to the management of illnesses particular to pediatric age group, though a permanent and exclusive surgery staff would not be present until much later than their medical counterparts. After that a plethora of children's hospitals swept across Europe and the United States and Canada. The first