Thai Infant Health Situation: Essential Medical Information for Family Centered Care

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Background: *The family-centered care requires reliable information on morbidity, mortality and related health problems to educate the responsible families.*
Objective: *To explore diseases and deaths of infants aged 29 days-12 months under the 2010 Universal Health Insurance in Thailand.*
Material and Method: *As per Sutra et al in 'Health situation analysis of Thai population 2010. The data included in the analysis were numbers and percents of primary diagnosis of each visit in the out patient department (OPD), admitted cases and infant death. Other health related issues were also retrieved from the existing sources of health information at country level.*
Results: *The infants aged 29 days-12 month had 9,721,266 OPD visits including factors influencing health (69.6%), respiratory infections (16.3%), Intestinal infection (2.4%) and other diseases (11.7%). The admitted cases commonly had respiratory infections (47.5%), intestinal infections (23.4%), other infections (4.8%) and congenital malformation (2.8%). The three most common causes of hospital deaths were perinatal conditions (25.2%), congenital malformation (21.4%) and respiratory infection (18.5%). There were also neonatal problems of low birth weight and iodine deficiency.*
Conclusion: *The infectious diseases and perinatal health problems were the main issues for family education in the family centered care to reduce the burden of diseases and infant death.*

Keywords: *Infant morbidity, Infant mortality, Family centered care*

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During the Tenth National Economic and Social Development Plan 2007-2011, Thailand resulted in an increase in GDP in 2011, resulting a dramatic decline in the proportion of people living in poverty (21% to 8.5%) between 2000 and 2007. Income disparity and large-scale migration to urban centers have together changed the family structure from being predominantly three-generation family households to "skip-generation" households, consisting of only grand-parents and children. This has led to more poverty-related issues such as household debt, domestic violence, lack of land, drug abuse and poor to no accessibility to health information.

The maternal and perinatal mortality has been reduced under the 'Safe Motherhood Project' and the 'Baby-friendly Hospital Initiative Program'. Universal healthcare coverage has had some impact on maternal and child health services but that impact depended upon awareness and understanding of the services available.

Family-centered care (FCC) can support and strengthen the family unit through advocacy, empowerment; thus enabling the nurture and support of child development. Access to information can help families to identify problems and make plans for their children. An effective FCC requires reliable medical information on the infant morbidity and mortality, to make appropriate decisions about child healthcare[1].

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Objective

In order to explore the reliable access to the burden of diseases, hospital deaths and related health issues among Thai infants between 29 days and 12

months of age, the number and percentage of primary diagnosis were analyzed in terms of out patients' visits, admissions, hospital discharges, deaths, length of hospital stays and hospital charges.

Material and Method

The present study is a part of the "Health Situation Analysis of Thai People 2010: Implications for Health Education and Health service Reform" described elsewhere in this journal. The main sources of analytic data were mainly from the Universal Health Care System for the fiscal year 2010. The diagnoses of diseases were classified by the International Statistical Classifications of Diseases and the Health Related Problems in the tenth Revision (ICD-10). The basic statistical analysis of variables (including frequency and interrelationships for each age and disease) were performed using SPSS version 11 for Windows.

The related infant health issues were reviewed from: (a) the Public Health Statistics Report 2010 (b) the UNICEF report on the Multiple Indicator Cluster Survey (MICS) of Children and Women in Thailand 2006[2] and (c) the Ministry of Public Health report on The Effectiveness of the Saiyairak Hospital under Patronage of His Royal Highness Crown Prince Maha Vajiralongkorn's Project 2009[3].

Results

Burden of diseases under the Universal Health Care System in 2010

The data from the Universal Health Care System (HC) revealed that there were 14,911 OPD visits/ 1,000 population among patients between 0 and 1 year of age; representing the largest number of out patiets' visits compared to any other age group. Of the total 9,885,195 out patiets' visits, the three main primary diagnoses were the (1) upper respiratory tract infections (2) diarrhea and gastroenteritis and (3) lower respiratory tract infections. The hospital admission rate was 1,241 visits/1,000 populations, which was also the greatest rate of any age group.

OPD visits for infants 29 days to 12 months of age

The top ten most common primary diagnosis from among the total 9,721,266 OPD visits for infants 29 days to 12 months of age are presented in Fig. 1. The factors most influencing health (69.6%) included (1) general health examination and investigation (18.4%) (2) person encountering health services (13.9%) (3) getting immunizations against combination of infections (16.9%) (4) getting treatment for a certain single infection (12.0%) or (5) bacterial infection (0.6%).

The respiratory infections (16.3% of the total) included acute nasopharyngitis (8.5%), acute upper respiratory tract infection (2.5%), acute pharyngitis (2.1%), acute tonsillitis (0.5%), acute bronchiolitis (0.5%) and pneumonia organism unspecified (0.3%). The other common OPD diagnoses-excluding external causes of morbidity & mortality (0.6) and congenital malformation (0.4%)-were infectious diseases, *viz.*, diarrhea and gastroenteritis (2.0%), other dermatitis (0.3%), conjunctivitis (0.3%) and stomatitis (0.2%). The other common disorders included flatulence/dyspepsia (0.5%), other functional intestinal disorders (0.3%), allergic contact dermatitis (0.3%), nausea/vomiting (0.2%), asthma (0.2%) and other anemias (0.1%).

Primary diagnoses of IPD children 29 days to 1 year of age

The admission rate for infants between 29 days and 12 months of age in the In-patient department (IPD) was 1.81% (178,982 out of 9,885,195) of the total OPD visits. The admission rates were higher in the northeastern (33.3%) and central (32.0%) regions than in the southern (18.5%) and northern (16.1%) regions. The hospital admission was significantly different among the community (55.0), secondary (20.2%) and tertiary (21.9%) care levels of hospital care. The lowest level of admissions was at private hospitals (3.0%). Male infants (60.8%) were more admitted than the female ones (39.2%), Almost all admitted infants (95.8%) were under universal coverage of 30 baht medical expense.

Respiratory (47.5% or 85,069 cases) and intestinal (23.4% or 41,831cases) infections were two most common reasons for admissions (Fig. 2). These diagnoses were more common in the northeastern (35.7%, 4.3%) and central (30.6%, 31.4%) regions than in the southern (18.7%, 16.7%) and northern (15.0%, 17.6%) regions. Diarrhea and gastroenteritis of presumed infectious origin (20%) was the most common reason for IPD admission. Most respiratory infections included pneumonia from unspecified organisms (13.2%), acute bronchitis (9.2%), acute bronchiolitis (7.2%), bacterial pneumonia (5.0%) and viral pneumonia (2.7 %).

The other infections (4.8% or 8,551 cases) mainly included (1) viral infection of an unspecified site (2,351) (2) viral infection of the skin (1,637) (3) other septicemia (1,465) (4) unspecified viral infection of skin (1,056) and (5) bacterial infection of unspecified site (935). The diseases of the digestive system (3.4% or 6,031 cases) included the (1) oesophagus, stomach and

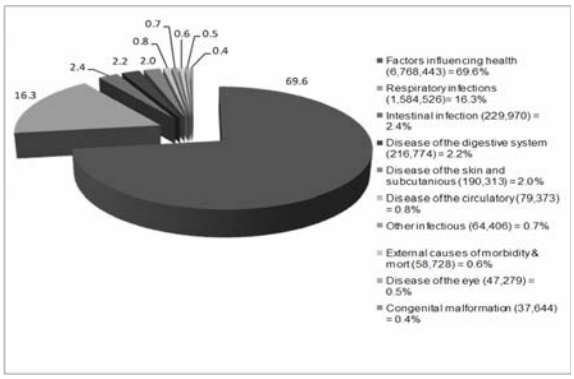

Fig. 1 Top ten most common primary diagnoses from among the total 9,721,266 OPD visits for children between 29 days and 12 months of age

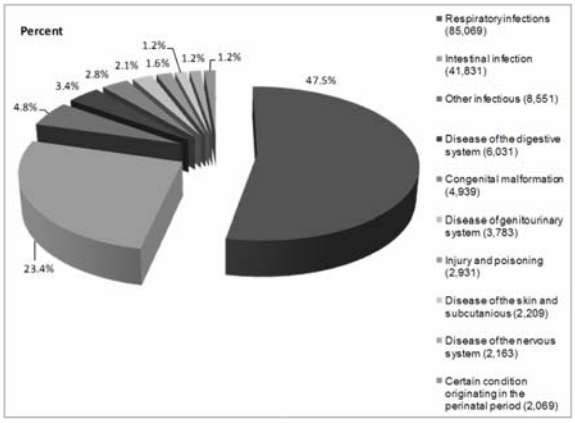

Fig. 2 Top ten most common primary diagnoses among 178,982 IPD children 29 days-12 months of age

duodenum (2,015) (2) other diseases of the intestines (1,184) (3) hernia (872) and (4) non-infective enteritis and colitis (622).

Congenital malformation (2.8% or 4,939 cases) included (1) cardio septa defect (500) (2) the great arteries (321) (3) other heart malformations (203) (4) cardiac chamber and connectors (174) (5) cleft palate with cleft lip (464) (6) cleft lip (418) (7) cleft palate (145) (8) malformations of the intestines (405), gallbladder and bile duct (189), tongue, mouth and pharynges (138) (9) atresia and stenosis of the large intestine (134) and (10) deformities of the feet (204).

Other common diseases included (1) the genitourinary system (2.1%) (2) injury and poisoning (1.6%) (*viz.*, intracranial injury (355), superficial and unspecified head injury (373)) (3) diseases of the skin and subcutaneous tissue (1.2%) (*viz.*, cutaneous abscess (553), cellulites (491), urticaria (276), local infection of skin (130) and acute lymphadenitis (116)) (4) diseases of the nervous system (1.2%) (*viz.*, episodic and paroxysmal disorder (1,004) and inflammatory diseases (639)) and (5) certain conditions originating during the perinatal period (1.2% or 2,069) (*viz.*, neonatal jaundice (468), bacterial sepsis (374), related short gestational and low birth weight (218), perinatal respiratory diseases (164) and congenital pneumonia (108)).

Diseases commonly admitted to tertiary hospitals included (1) neoplasm (81.9%) (2) Congenital malformations (81.3%) (3) diseases of the eye (72.3%) (4) mental and behavioral disorders (58.5%) (5) Musculoskeletal diseases (58.0%) (6) diseases of the blood (48.7%) (7) Diseases of the nervous system (48.2%) and (8) diseases of the circulatory system (43.6%).

The mean length of hospital stays was shortest among those with intestinal infection (2.79 days) and longest (11.38 days) among those with mental and behavioral disorders. The other cases admitted for longer than 7 days included (1) congenital malformation (9.44 days) (2) diseases of the nervous system (8.95 days) (3) certain conditions originating in the perinatal period (8.81 days) (4) neoplasm (8.57 days) and (5) endocrine nutritional and metabolic (7.60 days).

The greatest mean hospital charges (in Thai baht) according to the primary diagnosis were for congenital malformations (48,965 baht) while the lowest charges were for intestinal infection (3,286 baht). The other admitted cases being charged more than 10,000 baht included (1) neoplasm (2) muscular skeletal diseases (3) endocrine nutritional and metabolic diseases (4) diseases of the nervous system (5) diseases of the circulatory system (6) diseases of the respiratory system (7) certain conditions originating during the perinatal period and (8) diseases of the eye.

Hospital death of infants 29 days to 12 months of age

The total number of deaths for children between 29 days and 12 months of age was 1,442 cases; of which 387 and 63 were between 0-7 and 8-28 days of age, respectively. The death rate per admission of infants between 29 days and 12 months of age was 992/178,982 or 554.44/100,000 population.

All of the causes of death of children between 29 days and 12 months of age are presented in Fig. 3. The 'certain conditions originating in the perinatal period' (25.2% or 363 cases) were due to disorders related to (1) length of gestation (11.3%) (2) Respiratory distress of newborn (3.8%) (3) Bacterial sepsis of newborn (2.84%) (4) birth asphyxia (1.6%) (5)

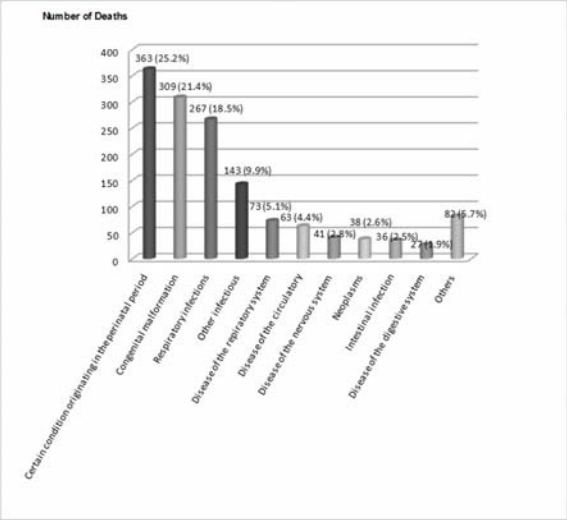

Fig. 3 Number (and percentage) of causes of death among children between 29 days and 12 months of age

Congenital pneumonia (1.4%) (6) slow fetal growth and fetal malnutrition (0.42%) (7) and necrotizing entero-colitis (0.28%).

The congenital malformations causing death (21.4% or 309 cases) included primarily (1) cardiac malformation (8.5%) (2) Edward's syndrome (1.5%) and (3) the musculoskeletal system (1.1%)

The most common infant infections were (1) respiratory infections (18.5%) from unspecified pneumonia (11.2%) and bacterial pneumonia 5.9% (2) other septicemias (8.1%) and (3) HIV disease (0.8%).

The least common causes of death included diseases of (1) the respiratory tract diseases (5.2%) (2) acute myocarditis and cardiomyopathy (0.8%) (3) the nervous system (2.8%) (*e.g.*, bacterial meningitis (0.8%)) (4) neoplasms (2.6%) and (5) unspecified leukemia (0.5%)). Only a few deaths were caused by intestinal infections (2.5%), diseases of the digestive system (1.9%), intracranial injury (0.8%) or other metabolic disorders.

Public health statistics 2010 on infant mortality and morbidity

The Crude Birth Rates (per 1,000 populations) dropped from 14.8 to 12.0 between 1997 and 2010. The infant mortality rate (per 1,000 live births) slowly decreased from 31.48 in 2000 to 21.83 and 16.39 in 2003 and 2011, respectively. The infant death rate among infants between 28 days and 2 months was the highest compared to all other age groups and was relatively stable between 2006 and 2010 (*i.e.*, 11.1 vs. 10.6). In 2010, the infant death rate declined from 6.4 for those 2 months of age to 1.2 for those 11 months of age.

By 2010, the top ten causes of death for those under 1-year reported as per 100,000 population was (1) 394.3 for certain conditions originating during the prenatal period (2) 125.5 for congenital malformations (3) 111.8 for symptoms signs abnormal laboratory investigation findings (4) 53.9 for diseases of the respiratory system (5) 35.4 for pneumonia (6) 23.9 for certain infectious diseases (7) 18.4 for external causes (8) 16.1 for other diseases of the respiratory system (120) (9) 15.7 of diseases of the circulatory system and (10) 11.9 for heart diseases.

Effects of child poverty trends

The MICS 2006 focused on existing household poverty in households with children, which was higher in the rural areas of the northeastern (49%) and northern (22.4%) regions. The rate of low birth weights was 9.2/1,000 population. Only 20.9% of 0-11 month-old children were adequately fed with supplementary foods. The under-five children continued to suffer from moderate underweight (9.5%), stunting (11.9%) and wasting (4.1%), especially in the southern region. Family violence occurs in both poor households and nuclear families, which affects pregnant women and child health outcomes.

According to a Ministry of Public Health survey in 2011, not all pregnant women (82.4%) use (and consume) iodized salt. Urinary iodine testing confirmed that 38.0% of pregnant women had iodine deficiency and 4.1 percent of newborns. Both of these figures are higher than the WHO recommended targets (< 3 %).

Effectiveness of health prevention and promotion

The MICS 2006 showed that 1.3% of children have never received any form of vaccination; especially in municipal areas due to conflicts of time, particularly in the central region, including Bangkok. According to the public health statistics 2008, the respective immunization coverage for BCG, DPT, OPV, measles and hepatitis B vaccine was 99.9, 98.7, 98.7, 98.1 and 98.3%. The incidence (per 100,000 populations) of measles and viral hepatitis B was 9.57 and 6.94, respectively.

The UNICEF report on MICS 2006 revealed that the exclusive breastfeeding (ECB) rate for the 0-5 month age group was 5.4%, which was the lowest for East Asia and the Pacific region, due to a low rate of timely initiation of breastfeeding, *i.e.*, within one hour after birth (49.8%). To contrast, a national hospital

survey in 2006[4] found a higher rate of ECB for 6 months (14.5%). After the Saiyairak Hospital Implementation in 2008, the ECB for 6 months rose to an average 29.6 and 50.4% in 2010 and 2011, respectively[3]. A recent Community Clustered Survey showed that the ECB for 0-6 months was as high as 43.6%[5]. The ECB rate slowly declined from 70.5% to 53.9, 46.1, 37.6, 31.1 and 23.6% at < 1, 2, 3, 4, 5 and 6 months of age, respectively, suggesting that Thailand has introduced effective measures for achieving the WHO exclusive breastfeeding rate (> 30%).

According to the Public Health Report for 2011[6], 28.6% of children between 1 and 3 years of age were at risk of delayed development, including (1) delayed speech (16.8 %) (2) delayed psychosocial skills (7.2%), delayed gross motor skills (5.9%) and delayed dexterity (4.9%). Growth monitoring of children between 1-3 years of age showed more overweight (10.6%) than underweight (6.3%).

Discussion

Infant health status has actually improved in terms of vital statistics, infant mortality and immunization coverage. Notwithstanding, infants between 29 days and 12 months of age continue to suffer from preventable infections, especially respiratory and intestinal infections, as seen by the number of OPD visits and IPD admissions. Congenital malformations, however, were responsible for the highest hospital charges and the second most common cause of infant death.

Conditions originating during the perinatal period-the top cause of death for infants between 29 days and 12 months of age-were highly associated with short gestation and low birth weight. Maternal factors and high risk pregnancy were also significant causal factors of low birth weight, so parents should be impressed with the importance of identifying risks and planning for an optimal birth with the least risk of perinatal complications. Integrated maternal and child health services-delivered through parenting classes and health volunteer clubs-can effectively reduce infant mortality. In addition, families should be encouraged to consume iodized salt so as to avoid congenital hypothyroidism.

IPD infants (29 days-2 months of age) were the most vulnerable to death from respiratory and other infections. The lack of breastfeeding thus resulted in serious infection, especially and intestinal[9]: FCC would encourage more awareness of the importance of breastfeeding. As more than half of the children in this age group were brought for health-screening and receiving immunization against various infections, healthcare providers should take this opportunity to strengthen the family's awareness on the prevention of malnutrition as well as the developmental delay. Thus, the medical curricula need to emphasize FCC (Family Centered Care)[7].

Conclusion

The infectious diseases and perinatal conditions were the two most common problems among the infants between 29 days and 12 months of age. In terms of family education in the family centered care, the effective antenatal care and early initiation of exclusive breastfeeding, especially in preterm infants, were the recommended measures to reduce the morbidity and mortality among them.

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Potential conflicts of interest

None.

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สถานการณ์สุขภาพของทารกไทย: ข้อมูลทางการแพทย์ที่จำเป็นสำหรับการดูแลรักษาที่เน้นครอบครัวเป็นศูนย์กลาง

กุสุมา ชูศิลป์, เพ็ญศรี โควสุวรรณ,ชาญชัย พานทองวิริยะกุล, แก้วใจ เทพสุธรรมรัตน์, ศุภากร วังซ้าย, สุมิตร สุตรา

ภูมิหลัง: *การดูแลรักษาที่เน้นครอบครัวเป็นศูนย์กลางต้องการข้อมูลที่เชื่อถือได้เกี่ยวกับความเจ็บป่วย การเสียชีวิต และสภาวะสุขภาพอื่นของทารกเพื่อให้สุขศึกษาแก่ครอบครัวที่รับผิดชอบ*

วัตถุประสงค์: *เพื่อค้นคว้าข้อมูลการเจ็บป่วยและการเสียชีวิตของทารกไทย อายุ 29 วัน ถึง 12 เดือน ในโรงพยาบาลภายใต้ระบบประกันสุขภาพแห่งชาติ ปี พ.ศ. 2553*

วัสดุและวิธีการ: *อ้างถึงวิธีการศึกษาของ สุตราและคณะ เรื่องการวิเคราะห์สุขภาพของคนไทย ข้อมูลที่วิเคราะห์แสดงจำนวน และร้อยละของคำวินิจฉัย ของผู้ป่วยนอก ผู้ป่วยใน การเสียชีวิตของทารก ระยะเวลาพักรักษาและค่าใช้จ่ายในโรงพยาบาล รวมทั้งการทบทวนข้อมูลสุขภาพทารกที่เกี่ยวข้องจากแหล่งข้อมูลระดับประเทศ*

ผลการศึกษา: *ทารกอายุ 29 วัน ถึง 12 เดือน มาตรวจที่แผนกผู้ป่วยนอก จำนวน 9,721,266 ครั้ง ด้วยปัจจัยที่มีผลต่อสุขภาพ ร้อยละ 69.6 โรคติดเชื้อทางเดินหายใจ ร้อยละ 16.3 โรคติดเชื้อทางลำไส้ ร้อยละ 2.4 และโรคอื่นๆ ร้อยละ 11.7 ผู้ป่วยนอนรักษามีคำวินิจฉัยที่พบบ่อยได้แก่ โรคติดเชื้อทางเดินหายใจ ร้อยละ 47.5 โรคติดเชื้อทางลำไส้ ร้อยละ 23.4 โรคติดเชื้ออื่นๆ ร้อยละ 4.8 และภาวะพิการแต่กำเนิด ร้อยละ 2.8 สาเหตุเสียชีวิตในโรงพยาบาล เช่น ความผิดปกติระยะปริกำเนิด ร้อยละ 25.2 ความพิการแต่กำเนิด ร้อยละ 21.4 และโรคติดเชื้อทางเดินหายใจ ร้อยละ 18.5 ทารกแรกเกิดมีปัญหาภาวะน้ำหนักแรกเกิดน้อยและภาวะขาดสารไอโอดีนร่วมด้วย*

สรุป: *โรคติดเชื้อและความผิดปกติระยะปริกำเนิดเป็นประเด็นหลักในการให้สุขศึกษาแก่ครอบครัว ในการดูแลรักษาที่เน้นครอบครัวเป็นศูนย์กลาง เพื่อลดความเจ็บป่วยและการเสียชีวิตของทารก*