Causes of death in children under-age of five years in Babylon province

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Abstract

Iraq lacks data on under-5 mortality causes. The vital registration system is poor in rural regions where access to health care is restricted and most fatalities occur at home, outside the health system, and the reason of death remains undetected. Knowing under-5 mortality patterns and trends helps decision-makers evaluate programmatic requirements, priorities interventions, and track progress. The aim of study is to describe the main causes of death under 5 years and evaluate the effects of different variables like: age, sex, body weight, residency, day and time of death and month of year, on the cause of death. This is a retrospective study which was carried out in order to find out the main causes of death among children younger than 5 years in Babylon province for the period of one year from 1st January 2010 to 31 December 2010, in formation was collected from patients files and death certificates. The leading causes of death among under-five children was found to be prematurity (26.8 %) , sepsis (18.4 %), congenital anomaly (15.4 %), birth asphyxia (7.7 %) and pneumonia (7.4 %), (86.2 %) of total mortality occurs in the first year of age, of this (59.4 %) occurs within first month and (26.8 %) in the other eleven months, most deaths happened in male, live in rural area, with weight < 2,500 Kg, during first day of hospitalization, after mid night, in January and July. Our study showed deaths during neonatal period was more than half, most of them within first 28 days of life, children lived in rural area were more prone to death, the first day of admission was critical day and critical time was after mid night.

Keywords: Death, Children under-age of five years, Congenital anomaly

Introduction

Children are a nation's hope and future, as well as its heart. Investing in children is investing in a nation's future. Children's needs and rights, particularly the right to health and development, must be safeguarded [1]. Child mortality is a useful proxy indicator of overall development [2]. Several generations of Iraqi children born since 2003 have faced adverse

conditions that affected their nutrition, health, and mortality rates. Knowing the causes of child mortality in Iraq is necessary to draw up strategies and plans to reduce child mortality in order to reach the global millennium development goals. Effective child survival programmes need reliable information on death causes. Cause of death information is essential to priorities interventions, plan for their implementation, determine the efficacy of illness-specific treatments, and monitor disease burden trends in connection to national and international targets. The vital registration system's coverage is weak, especially in rural regions where access to health care is restricted and most fatalities occur at home, outside the health system [3].

Cause of death certification may range from basic diagnosis by health auxiliaries to accurate and complicated diagnosis by highly qualified individuals and postmortem examination by competent pathologists. In this research, as in many underdeveloped nations, the exact reason of death, even in teaching hospitals, is not always known due to a lack of modern investigations and unwillingness to undertake autopsies when needed [4]. In most impoverished nations, older children have a high death rate, even though the first year is the riskiest. In 2000, 38% of child fatalities globally were neonatal [5]. 99% of the 4 million newborn fatalities happened in underdeveloped nations. In 2000, under-5 mortality was 6 / 1000 in affluent nations but 173 / 1000 in Sub-Saharan Africa [1].

Diarrhea and malaria contributed negligibly to under-5 fatalities in the U.S. Unintentional injury accounts for 33% of mortality among 1–5-year-olds in the US, followed by congenital defects (11%), malignant neoplasm (8%), and murders (7%). 5% of this age group's deaths were from other causes [1]. UNICEF considers under-5 death rate the most significant indicator of global child health [6]. The goal of medicine is to promote individual health, hence planning for health care should be based on morbidity and death rates. The death rate for children drops considerably after the first month and during the first year.

In underdeveloped nations, 50% of overall mortality occurs in the first five years of life, with 79% in the first year, 43% in the first month, and 36% in the next eleven months. In wealthy countries, 70% of deaths occur in the first year, 46% in the first month, and 35% in the first week [7]. Diarrhea, acute respiratory infection, and newborn disease are important killers in impoverished nations [5]. More than 10 million children under 5 die each year, largely from avoidable causes in underdeveloped nations [8]. The aim of study is to identify the leading causes of mortality in children under the age of five and researching the role that certain risk factors play, we will conduct an extensive analysis of the available data.

Method

This is a retrospective hospital-based study done in the Babylon governorate, Babylon city is one of the middle Euphrates regions, it has a population of (1,824,251) with (310,123) children younger than 5 which represents 17 %. All deaths in infants and children from first day to 5 year of age which occurred in Babylon city hospitals which is ten hospitals including eight peripheral hospitals, from first day of January 2010 to end of December 2010 were included in this study. The final causes of death as reported on patients files and death certificates which was (1549) cases were analyzed according to the number of deaths by: age groups; first 28 day, > 28 day – 1 year, > 1 year – 5 years; sex of the deceased child; residency (rural, urban); Baby weights were grouped to < 2.5 Kg, 2.5 – 4 Kg and > 4 Kg. Statistically analysis by using chi square test P-value, to detect the significant level of difference with age, sex, residency, body weight, day and time of death and season of the year.

Results

This study was carried out from first of January to the end of December 2010. during this period (1549) child died in different hospitals in Babylon city most of them died in the Babylon hospital for maternity and children (750). The leading cause of death among under-five year children was found to be due to prematurity (26.8 %), sepsis (18.4%), congenital anomaly (15.4 %), birth asphyxia (7.7 %) and pneumonia (7.4 %). (Table 1).

Table 1.

Percentage of different causes of death.

Causes of death	Frequency	Percent
Prematurity	415	26.8 %
Sepsis	285	18.4 %
Congenital anomaly	238	15.4 %
Birth asphyxia	120	7.7 %
Pneumonia	114	7.4 %
Accident	90	5.8 %
Respiratory distress Syndrome	66	4.3 %
Meningitis	32	2.1 %
Other (gastroenteritis , hepatitis , intestinal obstruction , ……)	189	12.1 %
Total	1549	100 %

Table (2) present the causes of death by age group, the highest percent of death in the first 28 days (neonate) was prematurity, while the main cause of death beyond the neonatal age was sepsis as show in table (2).

Table 2.

Relationship between age and causes of death.

Cause of death	Age						Total
	Birht-1 month	%	>1-12 month	%	>12-60-month Years	%	
Prematurity	374	90.1	41	9.9	0	0	415
Congenital anomaly	183	76.9	55	23.1	0	0	238
Sepsis	87	30.5	192	67.4	6	2.1	285
Birth asphyxia	120	100	0	0	0	0	120
Pneumonia	33	29	48	42	33	29	114
RDS	66	100	0	0	0	0	66
Meningitis	7	22	8	25	17	53	32
Accident	0	0	13	14.4	77	85.6	90
Other	50	26.4	58	30.7	81	42.9	189
Total	920	59.4	415	26.8	214	13.8	1549

Death among male gender in all age groups was higher (850) (55 %) than in female gender (699) (45 %), this difference significant is statistically at a P-value of < 0.001. The causes of death and number vary from one month to another which show two peaks one in summer month and second in winter month as shown in figure (3). Day of death in hospitalized children shows most of deaths occurred in the first day after admission and decrease in the following days as show in figure (4).
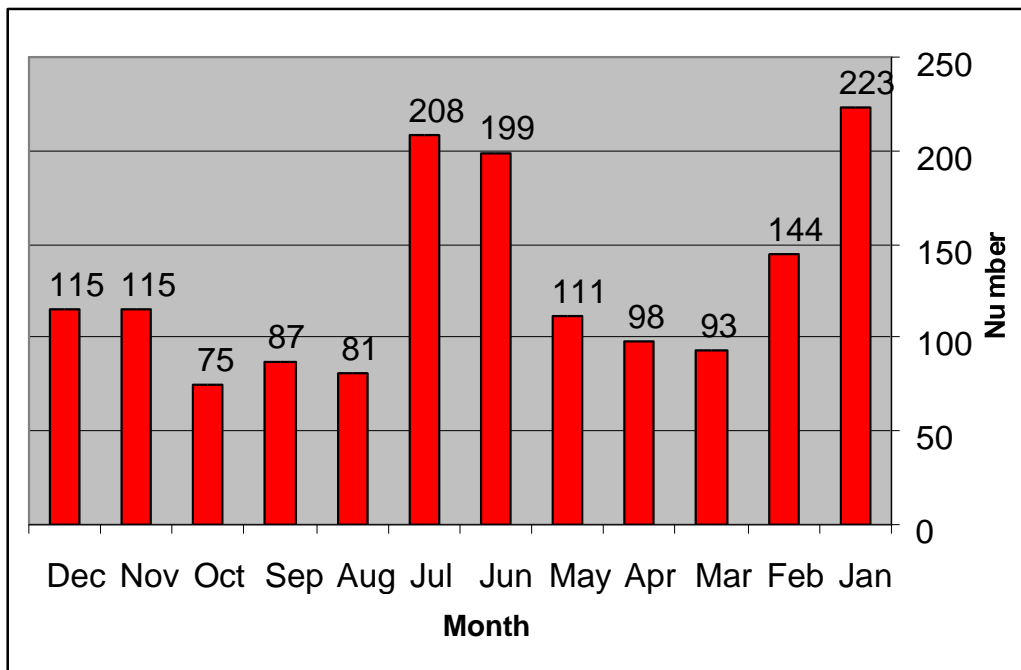
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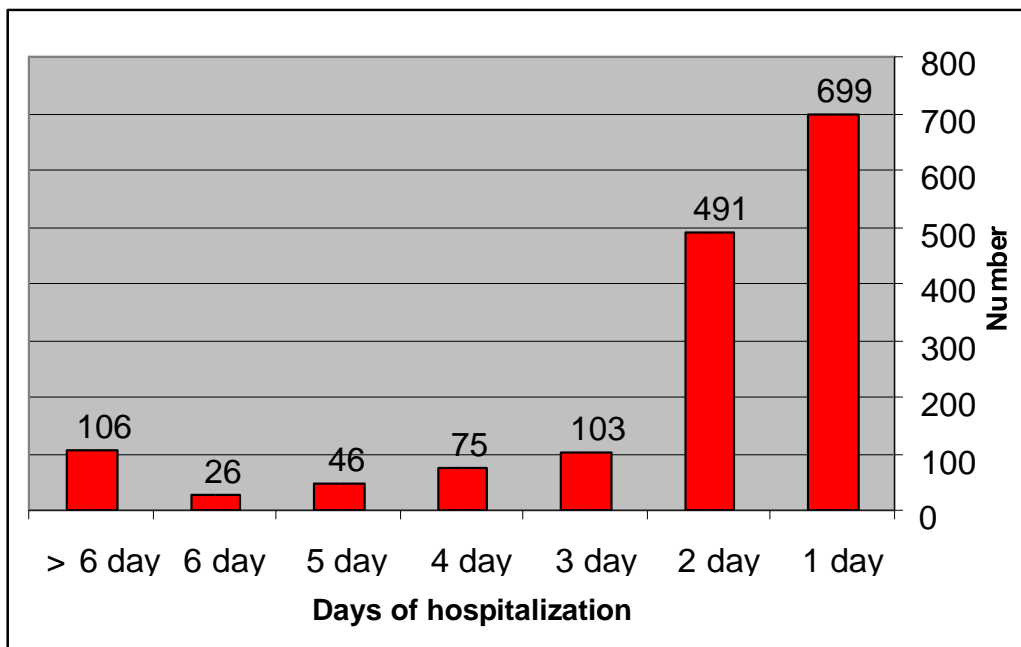
Distribution of death according to months of year.

Figure 4.

Distribution of death according today of hospitalization.

Table 3.

Distribution of babies according to gender, residency, and time of death.

Variables		No.	%
Gender	Male	699	45
	Female	850	55
Residency	Rural	940	61
	Urban	609	39
Time of death	12 am-7am	660	43
	7am-3 pm	360	23
	3pm- 12 am	523	34

Discussion

Children all over the world, especially in the developing countries the maximum number of deaths in this study was confined to the first 28 days of life which accounts for (59.4 %) of total deaths. This rate is similar to Sulaymania study in 2005 which was (61.8 %) [5], and in study of under 5-year mortality in Iraq in 2009 which accounts for (55.8 %) [1], and (50.1 %) in Egypt [9].

The high percentage of neonatal deaths could be explained by the deterioration of the health services and the socioeconomic conditions of the population after the 2003 war, especially that of women and children. All these factors had a deleterious effect on delivery and neonatal services [1]. In our study the main cause of deaths was prematurity (26.8%) of total causes followed by sepsis (18.4%) and congenital anomaly (15.4%), which contributed to increase in the number of death during neonatal period. In comparison to Sulaymania study where prematurity was the main cause of deaths [1], and in World Health Organization study, prematurity was the most common cause (28 %) followed by sepsis (26 %) and asphyxia (23 %) [10].

This higher rate of death from prematurity here is due to lack of well-equipped neonatal intensive care unit, surfactant therapy, mechanical ventilation, untrained staff. The second common cause of death was sepsis (18.4 %). In comparison to Sulaymania study, were diarrhea was the main cause of death beyond neonatal period [5], and in World Health Organization study, pneumonia was the most common cause of death followed by diarrhea [10]. Approximately five billion episodes of diarrhea occur worldwide annually, accounting for (15 to 30 %) of all deaths in some countries [11].

In our study pneumonia was the (7.4 %) which is the fifth cause of death. This difference is due to most of do not the hospitals do not write diarrhea and pneumonia as causes of death

in the death certificates to avoid legal investigation. congenital malformation contributes to (8 %) of neonatal deaths [12] which is less than estimated rate in our study (15.4 %), congenital malformation was the third common cause of death and the rate in the middle Euphrates region is more than that of the north region (15.4 %) versus (4.5%) in Sulymania study [5].

This difference could be explained by the widespread economic hardship and environmental factors which negatively affected the populations health of this region, among which was the 2003 war [1]. Death because of accidents injuries and poisoning ranked as the sixth major cause of death under 5 years in our study, contributing to (5.8 %) of under 5 deaths most of them between age 1 – 5 years.

The causes in this category included deaths due to traffic accidents, drowning, burning, falling from heights, and poisoning by kerosene, other petroleum products, agricultural pesticides, and household cleaners. In this study, from the total death, male "sex" accounted for about (55 %) and (45 %) in female, male: female ratio 1.2: 1 (i.e., male predominance). This is similar to the results obtained by the study of Sulymania [2005] [5], the same fact has also been noticed in other developing countries [13]. The death rate was inversely proportional to the body weight, in this study particularly in premature babies , as body weight increase the death number was found to decrease, this finding was similar other studies conducted in developing and developed countries [4]. Relatively the largest proportion (61%) was from rural and (39%) was from urban area.

This indicates a better family income, clean water supply, good sanitation, housing, and medical care in the urban children. This fact is similar to the result in many similar studies carried out in other developing countries including Iraq [2]. The cause of death varies from one month to another, which show two peaks one June and July, and the second January. The day of death after hospitalization show that the first day was the highest (45.1 %) which decreased to (31.7 %) in the second day and (6.6 %) in the third day.

This highest death in the first day of admission is due to late presentation, seeking for medical help, diagnosis and most children disease are in the emergency sector and late referral of critically ill children specially from peripheral hospitals. The large number of deaths occurs after mid night between (43%) and decreased to (34%) between 3:00 pm - 12:00 mid night, and lesser death occur in the morning between 7:00 am – 3:00 pm. This high number of deaths after mid night could be explained by decreased number of medical staff and body physiological changes at night in addition to decreased physiological efficiency of body organs [13].

Conclusion:

Both premature birth and sepsis were significant killers of children less than 5 years old. The first 28 days of a person's life are the most dangerous. Male were more liable to mortality than females. Children in the countryside had a higher mortality rate than their urban counterparts. Death rates and their underlying causes fluctuate with the seasons. The mortality rate is inversely related to size. The mortality rate is highest on the first day following admission and gradually decreases as more time passes in the hospital. Death rates seem to be highest around midnight.

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