Infant mortality and causes of infant deaths in 2018, in Adana, Turkey

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What is already known on this topic?

- The number of infant deaths is one of the most important parameters showing the health status of a country.
- Some infant deaths occur due to preventable causes.
- Descriptive studies on this subject are needed.

What this study adds on this topic?

- With this study, the causes of infant deaths in Adana were examined in detail. The most common causes of death have been identified.
- Besides the causes of infant mortality, data on the mothers and births of their deceased babies have also been reported.
- Because it is a descriptive study, it will guide future studies.

ABSTRACT

Objective: Understanding the etiologies of infant deaths and predicting risk begins with defining cases correctly. The collection and analysis of reliable statistical data are an essential part of comprehensive investigations on local and national levels.

Material and Methods: This was a descriptive study. Diagnosis as a cause of infant death and other factors were examined. Data were analyzed using the SPSS 17.0 program. Frequencies and means were computed.

Results: According to the data of 35 227 live births and 288 infant deaths during the year, the infant mortality rate of Adana province was 8.2 per thousand. We found that the most common cause of infant death was sepsis (26.0%). Other causes of infant death included prematurity and problems related to prematurity (12.6%), congenital heart disease and complications (12.6%), respiratory problems (11.9%), congenital anomaly (9.8%), immaturity (<750 g birth weight or 24 gestational weeks) (8.4%), and sudden death (6.0%).

Conclusion: In our descriptive study, we presented the causes of infant mortality to minimize infant mortality due to preventable causes. Efforts to reduce infant mortality should be supported and improved by health management. Emphasis on prenatal care is one of the important things to reduce premature births.

Keywords: Causes of death, infant death, mortality, prematurity

Introduction

Infant mortality is one of the important indicators of the health of a nation because it is associated with a variety of factors such as maternal health, access to medical care, socioeconomic conditions, and public health services (1, 2). The fourth Millennium Development Goal (MDG4) was to reduce under-five mortality by two-thirds between 1990 and 2015. Infant mortality constitutes approximately 75% of the under-five mortality (3). In the United States in 2013, the infant mortality rate was 5.98 per 1000 live births (4). In Turkey in 2018, the crude birth rate was 15.3 per thousand and the infant mortality rate was 9.3 per thousand (5).

A live birth that results in death within the first year (<365 days) is defined as an infant death. Infant deaths are characterized as neonatal (<28 days) and further subdivided into early neonatal (<7 days), late neonatal (7–27 days), or post-neonatal (28–364 days). All live births, regardless of gestational age, are reported as vital record events. Infant deaths include both the reporting of a live birth event and a death event using a certificate of live birth and a certificate of death, separately. Information from the certificate of a live birth, including demographic information, selected maternal risk factors, maternal labor and delivery information, and infant weight and gestational age, is linked to information on the infant death certificate to include cause-of-death information (6).

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Understanding the etiologies of these deaths and predicting risk begins with correctly defining cases. The collection and analysis of reliable statistical data are an essential part of comprehensive investigations on local and national levels.

This report presents descriptive tables of infant mortality data by a variety of maternal and infantile characteristics. These tables are useful for understanding the basic relationships between risk factors and infant mortality but unadjusted for the possible effects of other variables.

Material and Methods

This report presents infant mortality data from the 2018 period linked file. In the linked file, information from the death certificate is linked to information from the birth certificate for each infant under age 1 year who died in Adana, Turkey during 2018. The purpose of the linkage is to use the many additional variables available from the birth certificate to conduct more detailed analyses of infant mortality patterns. This report presents infant mortality data by birth weight, period of gestation, sex of infant, maternal age, live-birth order, time between the previous pregnancy, type of birth, mother's marital status, mother's education, age at death, and the underlying cause of death.

Patient consent was not obtained because our study was conducted from the records. The study was approved by the Institutions' Ethics Committee. Our study received ethical approval at the meeting of Çukurova University Faculty of Medicine Ethics Committee (Date: 31.08.2019, No.: 80). Our study complied with the Helsinki Declaration principles.

Statistical analysis

This was a descriptive study. Diagnosis as a cause of infant death and other factors were examined. Data were analyzed using the Statistical Package for the Social Sciences (SPSS Inc.; Chicago, IL, USA) version 17.0 program. Frequencies and means were computed. The results are presented using tables and graphs with statistical inference.

Results

According to official records, 288 infants died in 2018 in Adana. However, because the information of three babies was not available in our system, the analyses of our study were made according to the information of 285 babies. Only the infant mortality rate was calculated based on 288 infant mortalities. This number included infants living in Adana. According to the data of 35 227 live births and 288 infant deaths during the year, the infant mortality rate of Adana province was 8.2 per thousand.

About half (49.1%) of the infants who died in 2018 were boys and 50.9% were girls. Seyhan and Yüreğir districts had the highest number of infant mortalities in direct proportion to population density. First, we examined the sociodemographic data: 8.8% of the mothers were uneducated, there was only one mother under the age of 18 years, and the rate of mothers aged over 35 years was 17.7%. The rate of smoking among the mothers was 6.3%. Nearly one-quarter (23.9%) of the parents had consanguineous marriage (Table 1).

It was the first pregnancy of 28.1% of the mothers. Twenty-seven percent had previously miscarried, and 3.5% had previously delivered stillbirth. In addition, when we examined the mothers who had two or more pregnancies, 26.0% had less than two years between their previous pregnancies (Table 1).

Only one of the babies was born at home, all the remaining births were at a health facility. The birth of 30.9% of the babies occurred by normal vaginal delivery, 64.2% of the deliveries were preterm and there was no post-term births. The rate of early preterm infants (under 34 weeks) was 54.7%. Some 10.2% of the babies who died in our province were born as a result of twin pregnancy and 2.5% as a result of a triplet pregnancy.

In 18% of infants, the mothers had a health problem during pregnancy. The most common problems were anemia (25.0%), hypertension (23.1%), and gestational diabetes (17.3%). Bleeding, premature rupture of membranes, chorioamnionitis, placenta previa, and polyhydramnios were the other problems faced by mothers during pregnancy. The birth weight of 45.6% of the babies was less than 1500 grams and the birth weight of 17.2% was between 1500 and 2500 grams.

When the infant mortality rates were analyzed according to gestational age, the highest infant mortality rate was found in early preterm infants (4.42 per 1000 live births) (Figure 1). According to birth weight, the highest infant mortality rate was found in infants born below 1500 grams (3.69 per 1000 live births) (Figure 2).
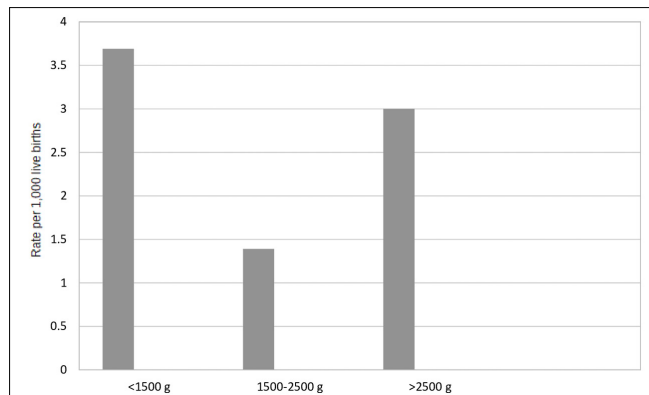
When we looked at the causes of infant death, we found that the most common cause of infant death was sespis (26.0%). Other causes of infant death, included prematurity and problems related to prematurity (12.6%), congenital heart disease and complications (12.6%), respiratory problems (11.9%), con-

Table 1. Maternal and birth characteristics		
	n	%
Smoking mothers	18	6.3
First pregnancy	80	28.1
Multiple pregnancies	36	12.6
Presence of risk factor in pregnancy	52	18.2
Rh mismatch	18	6.3
Consanguineous marriage	68	23.9
Stillbirth and miscarriage history	87	30.5
Preterm births	183	64.2
Total	285	100

Table 2. Causes of infant death, 2018, Adana		
Causes	n	%
Sepsis	74	0
Prematurity and its problems	36	12.6
Congenital anomaly and complications	36	12.6
Respiratory problems	34	11.9
Immaturity	24	8.4
Congenital heart disease	23	8.1
Sudden death/cause unknown	17	6.0
Asphyxia	4	1.4
Others	37	13.0
Total	285	100

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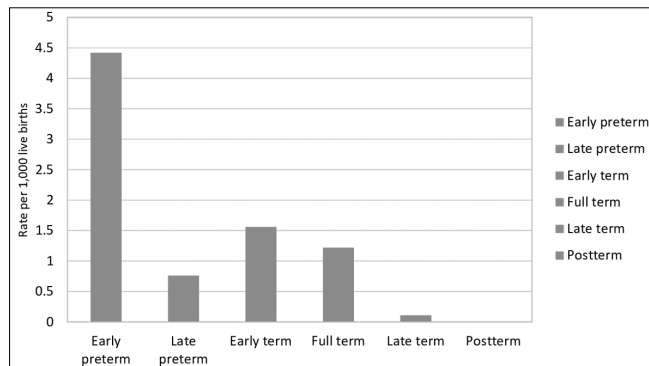
Figure 1. Infant mortality rate per thousand live births by birth time

Figure 2. Infant mortality rate per thousand live births by birth weight

genital anomalies (9.8%), immaturity (<750 g birth weight or 24 gestational weeks) (8.4%), and sudden death (6.0%) (Table 2).

Discussion

Turkey has made important progress in reducing both infant mortality and preterm birth. According to the Turkey Statistical Institute data, 1 248 847 live births occurred in 2018 in Turkey. The crude birth rate was 15.3 per thousand and the infant mortality rate was 9.3 per thousand (5). In the same year, the number of live births in Adana was 35 227. The crude birth rate was 15.9 per thousand and the infant mortality rate was 8.2 per thousand.

Recent studies have argued that high preterm birth rates in the United States are the major contributor to higher infant mortality rates. Studies have generally compared the United States of America (USA) with Scandinavian countries, which have among the lowest infant mortality rates in Europe, and have generally focused on gestational age rather than birth weight (7, 8). In 2005, the USA fetal mortality rate was 6.22 fetal deaths of 20 weeks of gestation or more per 1000 live births and fetal deaths, compared with an infant mortality rate of 6.86 (9, 10). Also, prematurity and problems related to prematurity were the second most common causes of infant mortality with 12.6%. In most countries, infant mortality rates are higher for male infants (11). However, in our study, the ratio of male and female babies was almost the same.

Maternal age is an important factor both for having a healthy pregnancy and raising healthy babies. According to the Mar-

kovitz et al. (12) study, maternal age below 18 years is a risk factor for infant mortality. In our study, there was only one mother under the age of 18 years and the rate of mothers aged over 35 was 17.7%. According to the data of our study, there was only one mother aged under 18 years who gave birth. The decrease in the number of adolescent mothers may be the result of the studies conducted to prevent early birth in our country.

In a study conducted in Latin America, it was determined that maternal hypertension, eclampsia, diabetes, pregnancies older than 35 years, and Rh incompatibility were risk factors that increased fetal and perinatal deaths (13). Similarly, in our study, the mothers had a health problem during pregnancy in 18% of infants. The most common problems were anemia (25.0%), hypertension (23.1%), and gestational diabetes (17.3%).

According to previous research, the most common cause of infant deaths in Turkey was neonatal disease. Congenital anomalies were the cause of one-quarter of deaths and infections were the cause of approximately one-fifth of deaths (14). In a study conducted by Öztürk et al. (15) in Kayseri, pneumonia, prematurity, and congenital anomalies were the three most important causes of death in infants. In a study conducted in Narlıdere, congenital anomalies, premature births (25%), pneumonia (15%) were the top three causes of infant mortality (16). We found that the most common cause of infant death was sespis (26.0%). Prematurity and congenital heart disease were the second most common causes of infant mortality.

According to a study by Abate et al. (17) in Ethiopia, the risk of death for infants with very small size and smaller than the average size was higher. A study in Bangladesh showed that small birth size was associated with a higher infant mortality rate (18). In our study, the birth weight of 45.6% of the babies was less than 1500 grams and the birth weight of 17.2% was between 1500 and 2500 grams.

Limitations of the article
The research includes only infant death data within the boundaries of Adana province. Therefore, it cannot be generalized. In addition, we did not have information on the socioeconomic level of families, which is why socioeconomic data are not included in the study. Factors affecting infant mortality have not been analyzed because it is a descriptive study. Further studies are needed in this regard.

In conclusion, knowledge of infant deaths and their causes is important in the planning of health services. These deaths are among the most important indicators that give clues about the health status of the country or region. In our descriptive study, we presented the causes of infant mortality to minimize infant mortality due to preventable causes. Efforts to reduce infant mortality should be supported and improved by health management. Emphasis on optimal prenatal care is one of the important things to reduce premature births. In our study, consanguineous marriage is remarkable. It is important to provide the necessary information to people while giving counseling before marriage in terms of reducing the number of babies born with congenital anomalies.

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