

# Social and Medical Characteristics of Neonates Who Were Abandoned in a Tertiary Maternity Hospital in Turkey

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## What is already known on this topic?

- Child maltreatment has grown to be a severe issue on a global scale, having an impact on the social, emotional, and physical health of the population.
- Abandonment is a distinct type of child maltreatment.
- Infants under the age of 1 year who have been left unattended, in public, or in another unsuitable setting are referred to as "abandoned" infants.

## What this study adds on this topic?

- This study provides an insight into the newborn abandonment in Turkey by investigating the features of newborns who were left in a tertiary maternity hospital.

## ABSTRACT

**Objective:** This study aimed to investigate the characteristics of neonates who were abandoned in a tertiary maternity hospital and to determine the accompanying morbidities.

**Materials and Methods:** This hospital-based, retrospective descriptive study was conducted by evaluating the medical records between 2012 and 2019 in a tertiary hospital in İzmir.

**Results:** During the study period, there were 76 women who left their babies in the hospital following delivery. Median age of the mothers was 23 (range 12–44) years. Among them, 31.5% (n = 24) were below 18 years of age. Seventy-three of the pregnancies (96%) were unwanted, 67 of the mothers were unmarried (88.16%), of which 17 revealed a history of rape (22.36%), and 2 of them were victims of incest (2.63%). Thirty-six (47.36%) neonates were female and 36 of them (47.36%) were delivered by cesarean section. The mean gestational age was 37.3 ± 2.2 weeks and the mean birth weight was 2927 ± 572 g. Twenty-one (27.63%) babies were born prematurely and 15 (19.73%) had low birth weight. Four babies (5.26%) had hypoglycemia, 3 (3.94%) had hyponatremia, 5 (6.57%) had hypocalcemia, and 3 (3.94%) had hypomagnesemia.

**Conclusion:** Unwanted pregnancies were found to be one of the key reasons for newborn abandonment and linked to a higher risk of complications for both mother and child. To prevent unintended pregnancy and its negative effects, it is important to ensure that all adolescents have access to high-quality education in a safe and supportive learning environment, school-based health services, and increase access to contraceptive services, including emergency contraception and safe and legal abortion services.

**Keywords:** Abandoned baby, infant, neonate, social services, unwanted pregnancy

## INTRODUCTION

Child maltreatment has grown to be a severe issue on a global scale, having an impact on the social, emotional, and physical health of the population.<sup>1</sup> The scientific literature's definition of child maltreatment has expanded to encompass both active (acts of commission) and passive (acts of omission) varieties, moving away from earlier definitions that exclusively took child physical abuse into account. The former is typically referred to as "child abuse," while the latter as "child neglect."<sup>2</sup> Despite having differing definitions, the words "maltreatment" and "neglect" are sometimes used interchangeably. While "neglect" only refers to actions of omission, "maltreatment" refers to both acts of omission and commission. Neglect does not include maltreatment, while maltreatment includes neglect.<sup>3</sup>

Abandonment is a distinct type of child maltreatment. Infants under the age of 1 year who have been left unattended, in public, or in another unsuitable setting are referred to as

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“discarded” or “abandoned” infants. Leaving the infant in dangerous areas is an example of excessive neglect and is punishable by law,<sup>3</sup> whereas the term neonaticide refers to the killing of a newborn within 24 hours following delivery.<sup>4</sup>

In order to guarantee that newborns are abandoned in a secure setting and to prevent infant deaths, “Safe Haven” regulations have been introduced in the USA.<sup>5</sup> According to these regulations, mothers in crisis could legally and safely give up their children without facing legal repercussions in a specific site where they would be safe and receive care until a permanent home could be found. Hospitals are considered safe havens, and it is possible to leave the baby in the hospital after delivery without facing any legal penalties. The baby will then become a ward of the state and enter foster care until a permanent placement is found.<sup>5,6</sup>

If the mother is struggling, leaving the newborn at the hospital after delivery is an option also in Turkey. There are few reports from different countries investigating the characteristics of the abandoned infants through their national databases,<sup>7–11</sup> but we do not know much about the situation in Turkey. The purpose of this study was to identify the features of newborns who were left in a tertiary maternity hospital in Turkey and to identify the associated morbidities.

## MATERIALS AND METHODS

### Data Acquisition

This research was a hospital-based, retrospective descriptive study, which was conducted by examining the hospital records between 2012 and 2019. Written permission was obtained from the Ethics Committee of University of Health Sciences Tepecik Training Hospital (Decision no: 2019/17-10, Date: 28/11/2019).

At our hospital, as a rule, abandoned newborns are admitted to the level II neonatal intensive care unit (NICU) before their transfer to institutional care. On admission, blood samples were obtained for complete blood count, blood biochemistry, and serology for toxoplasma, rubella, cytomegalovirus (CMV), herpes simplex virus (HSV) type 1 and type 2, human immunodeficiency virus (HIV), hepatitis B virus, and hepatitis C virus (HCV). During their NICU stay, they are also screened for accompanying medical problems including congenital anomalies and neonatal infections.

Previous medical records were examined for neonatal and maternal accompanying illnesses.

### Primary and Secondary Outcome Variables of the Study

Primary outcome: Determining social characteristics of abandoned newborns.

Secondary outcome: Determination of accompanying morbidities in abandoned newborns.

### Statistical Analysis

The data were statistically evaluated using the Statistical Package for the Social Sciences 21.0 package program (IBM Corp, Armonk, NY, USA). Categorical variables were given as numbers and percentages, and numerical variables were given as mean  $\pm$  standard deviation, median (interquartile range), and minimum–maximum.

## RESULTS

### Characteristics of the Mothers

The median age of the mothers was 23, varying from 12 to 44. Among them, 31.5% ( $n = 24$ ) were adolescents, that is, below 18 years of age. Four (5.26%) mothers developed pre-eclampsia during pregnancy. One had mitral valve disease (1.31%) and 1 had psoriasis (1.31%). Seven (9.21%) mothers were seropositive for Hepatitis B virus surface antigen (HBsAg), 2 (2.63%) for HSV type 1 and type 2 immunoglobulin (Ig) M, 1 (1.31%) for anti-HCV, and 1 (1.31%) mother for VDRL (Venereal Disease Research Laboratory, Syphilis Test). Four mothers (5.26%) gave birth outside the hospital (at home, in the ambulance, at the hospital garden). Examination of previous medical records revealed that 3 mothers (3.94%) had behavioral disorders, 1 (1.31%) had bipolar disorder, 1 had panic disorder, and 2 mothers (2.62%) had epilepsy diagnosed in childhood. One mother had bilateral visual impairment with orthopedic problems.

Only 9 mothers (11.84%) were married, among them 2 were about to divorce. Seventy-three of the mothers (96%) had an unexpected pregnancy, among them, 17 gave a history of rape (22.36%). All of the adolescent mothers ( $n = 24$ ) were single, 11 of them disclosed a history of rape (14.47%) and 2 of them were victims of incest (2.63%).

Maternal negative behaviors during pregnancy included smoking ( $n = 42$ , 55.2%), alcohol consumption ( $n = 15$ , 19.73%), and substance abuse ( $n = 11$ , 14.47%). Among adolescent mothers, smoking ( $n=15$ , 19.7%), alcohol consumption ( $n = 8$ , 10.52%), and substance abuse ( $n = 5$ , 6.57%) are also prevalent. While 15 teenagers used alcohol and cigarettes concurrently while pregnant, 2 of them admitted to ever taking drugs, alcohol, and tobacco at the same time.

### Characteristics of the Infants

Thirty-six (47.36%) neonates were female and 36 of them (47.36%) were delivered by cesarean section. The mean gestational age was  $37.3 \pm 2.2$  weeks and the mean birth weight was  $2927 \pm 572$  g. Twenty-one (27.63%) babies were born prematurely and 15 (19.73%) had low birth weight. Among them, 1 baby (1.31%) with a gestational age of 31 weeks died after 53 days of hospitalization. The demographic characteristics of the infants were presented in Table 1.

On admission, complete blood counts were normal. Eight (10.52%) infants had high levels (i.e.,  $>10$  mg/L) of C-reactive protein (CRP). Four (5.26%) infants experienced hypoglycemia and 11 infants had electrolyte disturbances; hyponatremia in 3 (3.94%), hypocalcemia in 5 (6.57%), and hypomagnesemia in 3 (3.94%). Serologic evaluations revealed negative results for toxoplasma, rubella, CMV, HSV, and anti-HIV. Seropositivity for HBsAg was detected in 6 (7.89%) infants and for anti-HCV in 1 (1.31%) infant (Table 2).

All neonates underwent cranial and abdominal ultrasonography during their follow-up in the NICU. There were 16 neonates that had clinical indications for echocardiography. The results are presented in Table 3.

**Table 1.** Demographic Characteristics of the Infants

Type of birth	Vaginal birth, n (%)	40 (52.6)
	Cesarean section, n (%)	36 (47.4)
Gestational age, weeks	Mean $\pm$ SD	37.3 $\pm$ 2.2
	Median (minimum-maximum)	38 (26.2-41.6)
Prematurity	n (%)	21 (27.63)
Birth weight, g	Mean $\pm$ SD	2927 $\pm$ 572
	Median (minimum-maximum)	2915 (850-4200)
Low birth weight (<2500 g)	n (%)	15 (19.73)
Sex	Female, n (%)	36 (47.4)
	Male, n (%)	40 (52.6)
Apgar first minute	Median (minimum-maximum)	7 (3-8)
Apgar fifth minute	Median (minimum-maximum)	8 (4-9)
Length of stay, days	Mean $\pm$ SD	8.5 $\pm$ 6.8
	Median (minimum-maximum)	7 (1-53)

**Table 3.** Imaging Results of the Neonates in the Study Group

Cranial US	n	%
Cysts in the choroid plexus	2	2.63
Intracranial bleeding (stage II)	2	2.63
Ventricular dilatation	1	1.31
Mega cisterna magna	1	1.31
Bilateral increase in white matter echogenicity	1	1.31
Chiari malformation (type II)	1	1.31
Abdominal US	n	%
Hydronephrosis (stage I)	8	10.5
Hydronephrosis (stage II)	3	3.94
Hypertrophic pyloric stenosis	1	1.31
Unilateral adrenal hemorrhage	1	1.31
Increased echogenicity in renal pyramids	1	1.31
Echocardiography (n = 16)	n	%
Patent foramen ovale	10	62.5
Pulmonary stenosis	2	12.5
Normal	4	25

US, ultrasonography.

## DISCUSSION

Poverty, parent illness, and social taboos are reported to be the main causes of child abandonment.<sup>12</sup> In our study, unwanted

pregnancy was identified as the main reason for newborn abandonment. Generally, unwanted pregnancies are linked to a higher risk of complications for both mother and child. If the mother had no intention of becoming pregnant, she might engage in unhealthy habits or put off seeking care during her

**Table 2.** Complete Blood Count, Biochemistry, and Serology Results of the Neonates in the Study Group

Variables	n = 76	
Complete blood count	Mean $\pm$ SD	Median (minimum-maximum)
Hb, g/dL	17.2 $\pm$ 2.0	17 (12.7-23.2)
Hct, %	51.9 $\pm$ 6.2	50.8 (38.3-71.3)
White blood cell count, mm <sup>3</sup>	16,388 $\pm$ 4374	15 550 (8400-28 300)
Platelet count, mm <sup>3</sup>	257 750 $\pm$ 63 091	253 500 (74 000-424 000)
Biochemistry	n	%
Elevated CRP level (CRP >10 mg/L)	8	10.52
Hypoglycemia (glucose <45 mg/dL)	4	5.26
Hyponatremia (Na <130 mmol/L)	3	3.94
Hypokalemia (K <3.5 mmol/L)	-	-
Hypocalcemia (term Ca <8 mg/dL; preterm Ca <7 mg/dL)	5	6.57
Hypomagnesemia (Mg <1.5 mg/dL)	3	3.94
Serology	n	%
Toxoplasma (+)		
IgM	-	-
IgG	12	15.78
Rubella (+)		
IgM	-	-
IgG	40	52.63
CMV (+)		
IgM	-	-
IgG	10	13.15
HSV type 1 and type 2 (+)		
IgM	-	-
IgG	7	9.21
HBsAg (+)	6	7.89
Anti-HCV (+)	1	1.31
Anti-HIV (+)	-	-

CMV, cytomegalovirus; CRP, C-reactive protein; Hb, hemoglobin; HCV, hepatitis C virus; HIV, human immunodeficiency virus; HSV, herpes simplex virus; Htc, hematocrit.

pregnancy, which could harm the unborn child's health. One of the key reasons for newborn abandonment was found to be adolescent pregnancy in our study. One-third of the mothers in our sample were under the age of 18. Adolescent pregnancies inherit multiple risk factors; a recent meta-analysis from Turkey revealed that teenage pregnancy had various negative effects on mother and newborn health in terms of preterm birth, early membrane rupture, anemia, low birth weight/intrauterine growth retardation, low Apgar scores, and fetal distress.<sup>13</sup> In our study, 4 (5.26%) mothers developed preeclampsia during pregnancy, 4 mothers (5.26%) gave birth outside the hospital, 21 (27.63%) babies were born prematurely, and 15 (19.73%) had low birth weight.

In Turkey, the legal marriage age is 18 and children can marry as young as 17 with their parents' or guardians' permission. With special approval from the courts and under exceptional circumstances and on vital grounds, minors under the age of 16 may also get married.<sup>14</sup> However, our study included mothers even at the age of 12. Most of these children in the study group were victims of sexual abuse, and government protection was provided not only for the newborns but also for the adolescent mothers. Turkey has had civil and criminal legislation protecting children for many years. According to the child protection law, a child in need of assistance is the one whose physical, mental, emotional, moral, and communal development is endangered, who is abused or neglected, or who is a victim of a crime.<sup>15</sup> In our country, child sexual abuse cases were evaluated separately by Child Advocacy Centers by a multidisciplinary approach and social medical and supporting injunctions are taken into account.<sup>16</sup>

In the literature, most of the neonatal abandonments were associated with neonatal death. In a study by Gheorghe et al<sup>17</sup> in Denmark covering the period from 1997 to 2008, the authors reported forensically abandoned neonates' corpses. As a result of the examination of the autopsy reports, it was reported that 11 neonates' corpses were found, women who abandoned their neonates were on average aged 22 years, and 5 of the autopsied neonates were thought to be alive when abandoned. In 2 of these, the neonates were reported to be siblings and abandoned by the same mother. Two-thirds of the neonates were female (66.6%). It was shown that they were commonly left in plastic bags (~60%) and only 1 newborn was clothed when found. The cause of death was usually asphyxia, brain damage, or unknown. In a study, it was reported that symptoms of violence were observed in two-thirds of neonates without congenital malformations. In a study by Guha et al,<sup>12</sup> 11 neonates who were abandoned in the last 3 years were evaluated. It was shown that 73% were abandoned in the neonatal period and a 91% survival rate was achieved, and 6 (54.5%) neonates required emergency intervention at the time of admission access. Friedman and Resnick<sup>18</sup> showed in their article on neonaticide cases that the perpetrators of neonatal killers in industrialized countries were especially mothers. The authors stated that neonaticides were mostly committed by poor, relatively young, unmarried women who lacked prenatal care. The most important efforts to prevent these events were listed as the importance of improved sexual education and contraceptive access. Media reports were used in Sherr et al's<sup>19</sup> study on

abandoned neonates in the United Kingdom. In the evaluation, it was shown that an average of 16 neonates were abandoned per year, 124 neonates were identified in a 7-year period, 96 (77.4%) were younger than 1 week, and 28 (22.6%) were older than 1 week. It was emphasized that the strongest factors in survival were the age of the infant at the time of abandonment and being found by someone. Younger neonates were less likely to survive, and most neonates (74%) were abandoned outdoors. Of those found, 92% were found within 3 days of their abandonment.<sup>19</sup> In our study, all of the neonates that were abandoned in the hospital and all of the babies were given to social services for care; therefore, we did not come across neonatal death due to abandonment except 1 who died due to problems related to prematurity during his hospital stay. We could not reach any data regarding neonaticide or the neonates who were abandoned outside the hospital in our city. In Turkey, children are protected by legal regulations and it is vital that healthcare professionals know the current legislation regarding the safe abandonment of infants and advise mothers on this matter.

According to Olds et al,<sup>20</sup> unwanted pregnancies, rape, abandonment, poverty, drug misuse, mental disease, social pressure, and illegitimacy are some causes of child maltreatment and abandonment. Mothers who abandon their neonates are those who cannot eat well, live irregularly, do not have full self-control, and use alcohol, cigarettes, and drugs during pregnancy. Congenital disorders, intrauterine growth restriction, respiratory problems, and sudden death are more common in the children of these mothers.

Gender may also play as a reason in neonatal abandonment. In our study, less than half of the infants were female; however, a recent study from India reveals that abandonment can be sex selective, reporting a female:male ratio of 2.6:1 in abandoned infants.<sup>12</sup> In addition Indian National Crime Records indicate that the majority of abandoned children for over the past 5 years were females.<sup>12</sup> On the other hand, medico-legal autopsy of abandoned fetuses and newborns in India revealed no sex predilection.<sup>21</sup> According to some research, males were more likely to be abandoned, but this was not the case in other studies, which may be connected to the idea that males are viewed as more desirable children in some cultures.<sup>7</sup>

During pregnancy and after delivery, healthcare professionals have a crucial role to play in preserving and enhancing the health of newborns. The current laws governing the safe abandonment of infants must be understood by healthcare professionals in order to properly counsel mothers. Unwanted pregnancies and neonatal abandonment are closely related. Therefore, it is essential and crucial to offer counseling and training services to encourage the use of efficient family planning among risk groups including young and unmarried women. This situation allows for the provision of education and counseling, particularly to high school and university students as well as teenagers who do not attend school. In addition, health professionals should try to identify women who deny their pregnancy in special patient populations, pay attention, and work in collaboration with the social services to provide safe abandonment and prevent any harm to the newborn.

## CONCLUSION

Unwanted pregnancies were found to be one of the key reasons for newborn abandonment and linked to a higher risk of complications for both mother and child. Facilitating access to sexual education, contraception, and counseling services should be offered beginning with the studentship period. We believe that protecting adolescent females and ensuring their healthy physical, educational, and psychosocial development as well as their positive personalities is vital for the well-being of the society.

**Ethics Committee Approval:** This study was approved by Ethics Committee of University of Health Sciences Tepecik Training Hospital (Decision no: 2019/17-10, Date: 28/11/2019).

**Informed Consent:** Since the study is retrospective, informed consent was not obtained from the patients who agreed to take part in the study.

**Peer-review:** Externally peer-reviewed.

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