Bouroș-Tataru AL, et al., J Reprod Med Gynecol Obstet 2023, 8: 150
DOI: 10.24966/RMGO-2574/100150

HSOA Journal of Reproductive Medicine, Gynecology & Obstetrics

Research Article

# Premature Birth and Ethical Considerations in Arad, Romania

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## Abstract

**Introduction:** Advancements in maternal-fetal medicine have significantly increased the survival rate of newborns with very young gestational ages. However, the reduction in mortality for these patients does not necessarily correlate with a decrease in morbidities and neonatal disabilities due to prematurity, thereby raising numerous ethical issues.

**Materials and Methods:** A retrospective study was conducted on a cohort of 304 patients who experienced premature births at the Obstetrics Department of the Arad County Emergency Clinical Hospital during the 2021-2022 period. The study aims to identify the prematurity index in this department, the management strategies employed for cases of preterm birth, and the associated ethical issues.

**Results:** Among the total of 4640 patients, 304 gave birth prematurely, resulting in a prematurity index of 6.55%. Out of these cases, 71% underwent caesarean section deliveries. The APGAR score was positively influenced by the administration of corticosteroids for lung maturation, the use of tocolytics to delay preterm birth, and the decision to deliver by cesarean section.

**Conclusion:** Premature birth poses numerous ethical challenges for doctors responsible for the care of both the mother and newborn baby.

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**Citation:** Bouroș-Tataru AL, Furău AM, Bondar (Radoi) LI, Ardelean A, Boru C, et al. (2023) Premature Birth and Ethical Considerations in Arad, Romania. J Reprod Med Gynecol Obstet 8: 150.

**Received:** October 10, 2023; **Accepted:** October 16, 2023; **Published:** October 23, 2023



**Keywords:** Ethical issues; Prematurity; Risk factors

## Introduction

Preterm birth is defined by the World Health Organization as birth that occurs before 37 weeks of gestation or 259 days of amenorrhea [1]. In 2020, preterm birth affected 1 in 10 newborns in the United States, but this data varies depending on racial and ethnic differences. African American women had a 14.4 percent preterm birth rate, white women 9.1 percent, and Hispanic women 9.8 percent [2]. For the newborn to develop properly, the pregnancy must be completed as close to term as possible, as many essential organs for survival (such as the brain, lungs, and liver) complete their development in the last weeks of pregnancy. The earlier the birth occurs, the higher the rates of death, morbidity and disability.

Premature birth is the foundation of perinatal mortality and morbidity, and despite spectacular advances in medicine, its incidence has not seen significant reduction. Instead, these medical advances have resulted in a remarkable increase in the survival rate of preterm newborns, even at very young gestational ages. However, this success is accompanied by a rise in the rate of children with disabilities and neonatal morbidities, thereby giving rise to a multitude of ethical issues.

## Materials and Methods

This case-control study was conducted on 304 premature births registered during the 2021-2022 period in the Obstetrics Department of the County Emergency Clinical Hospital in Arad. The cases were stratified based on age categories, residence environments, correct dispensary attendance, smoking-related behavior, physiological and pathological history, pregnancy weeks, type of birth, APGAR score, birth weight, newborn survival or death, and mother risk factors.

The sample was obtained by selecting observation sheets strictly related to cases of prematurity as defined. Data were collected using IBM SPSS Statistics 24, and logistic regression was employed to compare risk factors in the analyzed groups, with $P < 0.05$ considered statistically significant. To conduct this study, the data were collected and processed with the consent of the management of the Obstetrics Department of the County Emergency Clinical Hospital in Arad, in compliance with the prevailing norms.

## Results

In 2021-2022 period, 4640 births were registered in the Obstetrics Department of the Arad County Emergency Clinical Hospital, of which 2775 were cesarean sections (59,71%). Births prior to a gestational age of 37 weeks accounted for 6.55% (n=304), all for pregnancies over 24 weeks. The average age of mothers in the studied group was 27 years, extremes 14-47, with a slightly increased percentage for those from rural areas (53% versus 47%), table 1.

Underage mothers (n=24) accounted for 7,89% of premature birth cases, table 1 and 70% of cases were insufficiently dispensed with and investigated, table 1. The ratio of smoking mothers to non-smokers is 1.3:1 in favor of non-smokers, table 1.

| Residence | Frequency | Percent | Cumulative percentage |
|---|---|---|---|
| Rural | 162 | 53.29% | 53.29% |
| Urban | 142 | 46.71% | 100.00% |
| Total | 304 | 100.00% | 100.00% |
| Age category | Frequency | Percent | Cumulative percentage |
| 14-18 ani | 24 | 7.89 | 7.89 |
| 19-24 ani | 88 | 28.94 | 37.9 |
| 25-29 ani | 85 | 27.96 | 65.8 |
| 30-34 ani | 55 | 18.09 | 85.1 |
| 35-39 ani | 24 | 7.89 | 93.8 |
| 40-47 ani | 28 | 9.23 | 100 |
| Total | 304 | 100 | 100 |
| Dispensary | Frequency | Percent | Cumulative percentage |
| Insufficient investigate | 212 | 69.73% | 69,73% |
| Investigate complete | 92 | 30.27% | 100.00% |
| Total | 304 | 100.00% | 100.00% |
| Smoking | Frequency | Percent | Cumulative percentage |
| Da | 130 | 42.76% | 42.76% |
| Nu | 174 | 57.24% | 100.00% |
| Total | 304 | 100.00% | 100.00% |

**Table 1:** Residential, age, dispensary characteristics and relationship to smoking.

Personal pathological history recorded in patients with premature birth in the studied group were secondary anemia - 10.55% gestational diabetes mellitus - 12.42%, HTA - 8.69%, cervical insufficiency - 8.69%, thrombophilia - 1.86%and history of caesarean section - 53.41%. Uterine contractions accounted for 61.49% of the reasons for admissions, followed by prematurely ruptured membranes with or without uterine contractions and vaginal bleeding.

In the study, the most preterm birth occurred at week 26 of pregnancy and most premature births were late and early. This is because the Obstetrics Department in Arad is a grade II unit, which does not have all the measures and equipment of neonatal intensive therapy to support the vital functions of a very early or extreme premature baby. In this unit, according to national protocol, all cases of labor or imminence of birth below 32 gestational weeks are sent to a clinic with a higher hierarchical level (1 hour away), if the situation of the mother and fetus allows ("in utero" transfer) [3].

Over 90% of premature births were late (n=274) and 8.07% of these premature births were to underage mothers.

Caesarean section was performed in 71% of cases and newborns' APGAR scores were positively influenced by this choice, figure 1.

Tocolytic treatment was administered in 197 cases or 64.80% of all premature births. Nifedipine (calcium channel blocker) was administered first. Oxytocin receptor blocker (Atosiban) is not available in this ward. In patients with gestational age under 32 weeks, preference is given to magnesium sulfate, which has a tocolytic effect by inhibiting uterine contractions and also reduces the risk of fetal cerebral hemorrhage [4]. In the ward where this study was conducted, Magnesium Sulphate is inconsistently available, which makes prophylaxis of many complications of prematurity impossible. In case of need for acute tocolysis, Hexoprenaline was administered.

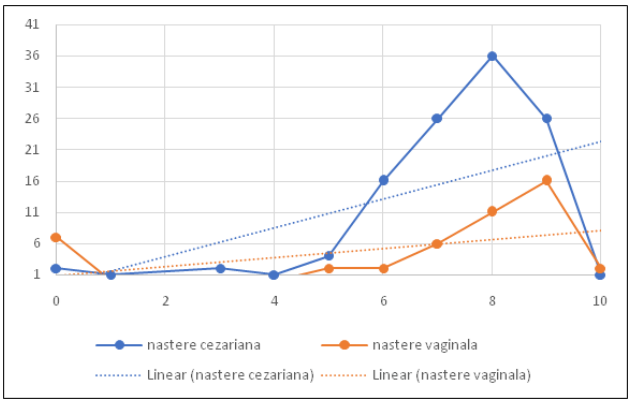


**Figure 1:** Relationship of APGAR scores to birth types and trend lines.

Treatment with glucocorticoids was administered in 244 cases, but not all cases were able to complete the full treatment (12 mg Betamethasone - 2 dose at 12-24 hours or 24 mg Dexamethasone in 48 hours) [3], because delivery occurred within 48 hours of the onset of the cure. History of abortions does not correlate with birth weight of the premature infant. This is why we analyzed other maternal or fetal risk factors, such as gestational diabetes, hypertension, presence of scar uterus, prematurely ruptured membranes, cervical insufficiency, anemia secondary to hemorrhage, maternal risk in to, fetal development revealed by birth weight as well as APGAR score [5]. Between this factors, we identified consistent bivariate correlations (Table 2).

| Item | APGAR Score | DZ | Rupture of membranes | History of caesarean section | Cervical Insufficiency | Secondary anemia |
|---|---|---|---|---|---|---|
| Weight | 0.000 | 0.005 | | | | |
| APGAR Score | | | 0.005 | | | |
| factoririscmaterni | | | 0.026 | 0.000 | | |
| History of caesarean section | | | | | 0.012 | 0.036 |
| Hypertension | | 0.000 | | | | |

**Table 2:** Bivariate correlations between various maternal and fetal risk factors.

Birth weight is a predictor of the viability of the conception product, as demonstrated by the analysis of the 161 cases (P = 0.00). Similarly, weeks of gestation are associated with birth weight (P = 0.00). The presence of maternal risk factors decreases the chance of viability of the conception product by 8.5802 times (95% CI 4.1921 - 17.5618, P < 0.0001) compared to pregnant women without risk factors (Table 3). Moreover, out of the 18 antepartum deaths, at least one could have been avoided if the pregnant woman with additional risk factors had been properly attended to.

In this study, we found no link between maternal risk factors and gestation, nor between smoking-related behavior and pregnancy age or birth weight of preterm infants. Instead, we identified statistically significant correlations between inconstant dispensation and low birth weight (P=0.004), as well as between the association of hypertension, cervical insufficiency, history of caesarean section, gestational diabetes, improper dispensation and very early and early prematurity. (P=0.000).

| | |
|---|---|
| Relative risk of fetal viability in the presence of maternal risk factors | 8.5802 |
| 95% CI | 4.1921 - 17.5618 |
| z statistic | 5.882 |
| Level of significance | P < 0.0001 |
| NNT (Harm) | 1.358 |
| 95% CI | 2.529 (Harm) to 0.929 (Harm) |

**Table 3:** Relative risk of death in preterm infants from pregnancies with present maternal risks.

## Discussion

Due to the fact that patients are not taken into account at the onset of pregnancy, maternal risk factors are not properly identified, monitored and treated through rigorous dispensary practices to ensure early genetic diagnosis, early detection of blood diseases, gestational diabetes, hypertension, anemia due to blood loss, etc. In Romanian society, the political class and medical societies, there is a particular focus on the issue of smoking in pregnant women, underage mothers, and abortions. Unfortunately, these situations, which are not responsible for premature deaths, divert attention from concrete efforts to reduce mortality in our country.

The proper conduct of hospital obstetrics, as revealed by the present study, involves administering corticosteroids for lung maturation, using tocolytics to delay childbirth for corticosteroid therapy administration, and deciding on cesarean section when necessary. The APGAR scores of premature babies born through these measures are positively influenced by these choices. The presence of maternal risk factors decreases the chance of viability of the conception product by 8.5802 times (95% CI 4.1921 - 17.5618, P < 0.0001) compared to pregnant women without risk factors, this result comes to emphasize the crucial role of sustained dispensation for pregnant woman.

Proper management for cases of threat or imminent premature birth involves: Establishing risk factors [6], a challenging objective to achieve, especially in the case of patients with uninvestigated pregnancy in whom the first medical visit is at the time of birth. The lack of antenatal investigation also entails the impossibility of maternal-fetal follow-up and establishing the risk of premature birth. Therefore, the lack of appropriate treatment such as progesterone or analyzing the need for cervical cerclage or the introduction of a pessary [6], becomes evident.

Another problem raised by the management of premature birth is the lack or inconstant presence of indispensable drugs on the department for the prophylaxis of premature birth, such as Atosiban or Magnesium Sulfate. As mentioned, patients under 32 weeks of age require "in utero" transfer to a clinic with a higher hierarchical degree, in our case this being in Timisoara ((1 hour away). The transport of these patients requires meeting several criteria: The patient must not be in advanced labor, the fetus must not be in fetal distress, there must be no risk of rapid complication of pathology, we must have an ambulance properly equipped for transport in a relatively short time. Many of these criteria are difficult to meet or predict. Additionally, the transport of newborns to a hospital with a higher hierarchical degree requires an ambulance specifically equipped for premature babies, available only in Timisoara.

Premature birth raises multiple ethical issues for doctors caring for both mother and newborn baby. These problems are related to the department's equipment, the management of complications and the benefficiency of intervention in such extreme cases. Conflicts also arise between pregnant women's autonomy and their obligations towards a product of conception whose viability limit is insufficiently defined. There may also be problems of economic resources and social implications at regional and national level regarding the care of extreme premature babies.

As an ethical duty, the doctor must correctly and explicitly inform the parent about the resuscitation procedures of the newborn and the evolution of these cases, obtaining consent for further treatment. However, this information is often hampered by uncertainty and uncertainty about the correct prognosis in the evolution of the newborn. The term 'uselessness of interventions' in critical cases is increasingly used, but it is not well defined, especially in the case of premature patients if the viability limit is not set. The use of this concept is common in preterm infants with severe neurological conditions or when care does not bring demonstrable and beneficial effects [7,8]. But proving whether aggressive treatment for very low birth weight preterm infants is unnecessary remains challenging.

The costs of caring for premature babies can reach high percentages of a country's GDP, and the population seems to accept this nature. However, in recent decades, topics have arisen related both to the costs of pre-adulthood itself and, therefore, to ethical issues regarding the chances of extremely low birth weight preemies. These long-term costs have become controversial topics [9]. Extreme preterm birth involves very high costs [10,11], both through immediate care after birth and through long-term costs related to the need for frequent hospitalization, necessary special education services, and the costs of family expenses for multiple admissions, care leave, and even job loss [12,13].

## Conclusion

In developing countries, preterm infants under 28 weeks of gestation have a 95% probability of death, while in developed countries, the survival rate of preterm infants aged 22-25 weeks reaches 90% [14]. The survival of newborns depends largely on the medical care received immediately after birth. Premature birth underlies perinatal mortality and morbidity. Medical advances have led to a spectacular increase in the survival rate of preterm newborns, even at very young gestational ages. However, this success is accompanied by an increase in the rate of children with disabilities and neonatal morbidities, thus raising a multitude of ethical issues.

## Acknowledgement

### Conflicts of interest

The authors declare that there was no conflict of interest.

### Contribution

All authors had equal contribution to this paper.

### Funding

This research received no external funding.

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