



Out-of-hospital Delivery: A Case Report

Hastane Dışı Doğum: Bir Olgu Sunumu

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Abstract

Unplanned out-of-hospital birth is defined as a birth that occurs before arrival and without a planned midwife or medical doctor. The frequency of complications in mothers and babies is higher in unplanned deliveries out of hospital. Due to the shortness of the uterus and a history of bleeding at the 17th week, a 27-year-old mother who was administered betamethasone three times intermittently and her baby who was 22 weeks old were brought to the pediatric emergency service by ambulance, with the umbilical cord not separated from the clamped placenta between the legs of the mother. The baby was hypothermic at the first evaluation. The baby was immediately warmed up, the navel was clamped and separated from the placenta, and nasal oxygen therapy was initiated. While the body temperature was 35.5 °C at the 20th minute of birth; placed in a thermal bag, placed in a transfer incubator, connected to nasal continuous positive airway pressure, and admitted to the neonatal intensive care unit. On the 9th day of her follow-up, baby died due to apnea, desaturation, and resistant acidosis and hypotension. This case is presented in order to minimize the complications related to out-of-hospital delivery and to emphasize the necessity for the healthcare professionals to be adequately trained and equipped for delivery and neonatal resuscitation management, and to develop protocols between health and ambulance services.

Keywords: Out-of-hospital delivery, mortality, perinatal morbidity, newborn

Öz

Planlanmamış hastane dışı doğum, hastaneye varmadan önce, planlı bir ebe veya tıp doktoru olmadan meydana gelen doğumdur. Hastane dışı plansız doğumlarda anne ve bebekte komplikasyon görülme sıklığı daha fazladır. Rahimin kısa olması ve 17. haftada kanama öyküsü nedeniyle üç kez aralıklı betametazon yapılan 27 yaşındaki anne ve 22 hafta olduğu öğrenilen bebeği annenin bacakları arasında göbek kordonu klempli plasentadan ayrılmamış şekilde çocuk acil servise ambulans ile getirildi. İlk değerlendirmede bebek hipotermik idi. Bebek hemen ısıtmaya başlandı, göbek klemplenip plasentadan ayrıldı, nazal oksijen tedavisine başlandı. Doğumun 20. dakikasında vücut sıcaklığı 35,5 °C iken; termal poşete konulup transfer kuvüze yerleştirilip, nazal sürekli pozitif hava yolu basıncına bağlandı, yenidoğan yoğun bakım ünitesine yatırıldı. İzleminin 9. gününde apne, desatürasyon ve takibinde dirençli asidoz, hipotansiyon nedeniyle eksitus oldu. Bu olgu hastane dışı doğum ile ilgili komplikasyonları en aza indirmek ve doğum ile yenidoğan resüsitasyon yönetimi için sağlık görevlilerinin yeterince eğitilmiş ve donanımlı olmasının, sağlık ve ambulans hizmetleri arasında protokoller geliştirilmesinin gerekliliğini vurgulamak için sunulmuştur.

Anahtar Kelimeler: Hastane dışı doğum, mortalite, perinatal morbidite, yenidoğan

Introduction

Unplanned out-of-hospital (OOH) births are the deliveries that occur without a midwife or doctor prior to arrival at the hospital.¹ It is important for healthcare personnel working in ambulances as worse outcomes are reported for mothers and infants compared to in-hospital and planned home births.² It has been reported that healthcare professionals working

in ambulances are in the second rank among healthcare personnel who encounter childbirth.³

The annual incidence of out-of-hospital deliveries is reported as 0.08-1.99%, which is quite low.^{1,4} The frequency of complications in mother and baby is higher in out-of-hospital births than in-hospital births. Perinatal conditions and inadequate postnatal care have been reported to be the most common causes of out-of-hospital neonatal deaths.⁵ Due to

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hypothermia, prematurity, asphyxia, jaundice, tetanus, and problems in the management of the placenta and umbilical cord, hospitalization in the neonatal intensive care unit (NICU) and mortality rates are higher.⁶

With this case, the problems experienced in the pre-hospital management of a 22-week-old premature baby born in an ambulance were discussed. In addition, it is presented to minimize the complications related to OOH births and to emphasize the need for the healthcare professionals to be adequately trained and equipped in neonatal resuscitation management at birth, to develop protocols between health and ambulance services, to help clinical management of the protocols, referral, and destination decisions.

Case Report

The baby of the 27-year-old mother with antenatal follow-up and uterine shortening, who had been administered betamethasone three times at the 17th week due to a history of bleeding, was from her 22-week second pregnancy and was brought by ambulance between the mother's legs. It was learned from the mother's history that she had been hospitalized in an external center due to bleeding two days ago, followed up for two days with a five-centimeter cervical dilation, and discharged the day before. The baby was born in the ambulance approximately two minutes before the admission, and was brought with the umbilical cord clamped and not separated from the placenta. The first minute APGAR score was unknown. In the evaluation at the fifth minute of birth, the 5th minute APGAR score was 7, and the baby was started to be warmed, the umbilical cord was clamped and separated from the placenta, and nasal oxygen therapy was started.

In the physical examination, the baby's general condition was moderate and he had groaning. The body weight was 470 grams (Picture 1). On arrival, his body temperature was 33.1 °C, heart rate was over 100/min, respiratory rate was



Picture 1. Transportation of the baby taken to the incubator in a thermal

38/min, and oxygen saturation (SpO₂) in room air was 99%. The lung examination revealed tachypnea, bilateral rales, subcostal, intercostal, suprasternal retraction, and nasal flaring. Cardiovascular system examination was normal, bilateral femoral artery pulses were taken. In the neurological examination, light reflex could not be evaluated and the baby was hypotonic. There were no sucking, searching and catching reflexes. The skin was bright red-purple, thin and immature.

The tenth minute body temperature was 35.1 °C, heart rate was 104/min, respiratory rate was 32/min, SpO₂ was 99%. The 20th minute body temperature was 35.5 °C, heart rate was 150/min, respiratory rate was 32/min, SpO₂ was 100%. The baby was wrapped in a thermal bag, placed in the transfer incubator, connected to nasal continuous positive airway pressure (CPAP), and admitted to the NICU.

In the blood gas taken from the umbilical vein, pH was 7.35, pCO₂ was 27.9 mmHg, HCO₃ was 15 mEq/L, lactate was 4 mmol/L, and blood glucose was 120 mg/dL, white blood cell was 10.310/mm³, platelet was 364,000/mm³, hemoglobin was 19.5 g/dL, hematocrit was 59.1%, C-reactive protein was 1.03 mg/L (normal range: 0-5 mg/L), interleukin 6 was 33.56 pg/mL (normal range: <7 pg/mL), procalcitonin was 0.687 ng/mL (normal range: 0-0.5 ng/mL). Amikacin, penicillin-G, fluconazole and caffeine treatments were started for the case.

On the fourth day of the follow-up, it was switched from nasal CPAP mode to non-invasive intermittent positive pressure ventilation mode due to apnea. Chest X-ray was consistent with respiratory distress syndrome. Echocardiography showed patent foramen ovale. On the fifth day, the baby was intubated due to increased apnea frequency and desaturation. Respiratory acidosis was observed in blood gas. Antibiotic treatment of the patient who was found to have increased acute phase reactants after sepsis screening was rearranged.

In the transfontanel ultrasonography taken on the 5th day of the hospitalization, grade 1 hemorrhage and nodular appearance were observed in the left caudothalamic groove. On the seventh day of the follow-up, dopamine was initiated due to hyperglycemic resistant acidosis, high lactate, and hypotension. Then, because hypotension did not improve and peripheral circulatory disorder developed, dobutamine treatment was started. Repeated echocardiography revealed impaired systolic functions and an ejection fraction of 41%. The patient, whose hypotension did not improve, died on the ninth day of the hospitalization. Consent for the study was obtained from the family.

Discussion

Although pre-hospital unplanned deliveries are rare, perinatal mortality and neonatal morbidity rates are high. This risk increases even more in very premature (<32 weeks) and extremely premature (<28 weeks) deliveries.⁷ In this case, the delivery was unplanned and happened very early and with low birth weight in the ambulance while trying to reach the hospital. The patient, whose first interventions were made in the emergency room, was quickly admitted to the NICU.

The most common complication in out-of-hospital deliveries is hypothermia and is the most important risk factor for mortality. In infants with low birth weight, every 1 °C decrease in body temperature from birth to NICU causes a 28% increase in mortality.⁸ In a study examining rewarming methods in out-of-hospital deliveries, it was reported that the way to prevent heat loss during the period until the baby's admission to the NICU was the training of personnel working in the pre-hospital management, the creation and use of a checklist, and improvement with continuous feedback. In the same study, it was also stated that the best method was the use of a transport incubator.⁸ Our case was hypothermic on arrival to the hospital, and it was thought that the intervention was insufficient due to lack of equipment. It is very important that health staff are trained to prevent possible complications.² In studies in the literature, the knowledge of healthcare professionals about neonatal life support was found to be at moderate level.⁵ In a study, it was reported that there was a 75% reduction in face mask leakage with an increase in theoretical knowledge after a simulation-based training.⁵ In another study, it was reported that healthcare professionals had low self-confidence in OOH births and felt unprepared to manage these cases.⁹ In our case, we could not determine the level of knowledge of the paramedics in the ambulance about neonatal management. However, despite the fact that the patient was premature and had a low birth weight, the presence of spontaneous breathing during delivery and the absence of excessive bleeding in the mother was a great opportunity for patient management. Therefore, health personnel training is very important in OOH births.

Moreover, it is very important to have the necessary equipment support as well as the training of health personnel for birth.⁷ As in our case, the lack of appropriate resources at birth delays the ideal care. For this reason, having the necessary equipment for both prehospital transportation and emergency services for the management and transport of these babies will prevent the development of possible complications.

There are also major deficiencies in the intervention and documentation of out of hospital deliveries.² In a study, it was found that approximately one-third of the cases had

missing documents, which made it difficult to determine how patients were treated.¹⁰ In another study, it was reported that important information such as newborn evaluation, including APGAR scores, was lacking and documentation was scarce.¹¹ All interventions applied in order to evaluate the effectiveness of the actions taken should be written completely and accurately. In this way, the deficiencies of the health personnel, the points where they are inadequate and the deficiencies in the materials can be determined and their supply and personnel training can be arranged.²

Conclusion

It is important to train health personnel at regular intervals due to the bad consequences of unplanned births for mother and baby. Complication rates can be reduced by providing the necessary materials for transport in both ambulances and emergency services.

Ethics

Informed Consent: Consent for the study was obtained from the family.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: S.T.G., O.D.G., Y.M.A., İ.F., Ö.Ç., Design: S.T.G., O.D.G., Y.M.A., İ.F., Ö.Ç., Data Collection or Processing: S.T.G., O.D.G., Analysis or Interpretation: S.T.G., O.D.G., Y.M.A., İ.F., Ö.Ç., Literature Search: S.T.G., O.D.G., Writing: S.T.G., O.D.G.

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