AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 3, Issue 8, 2025 ISSN (E): 2993-2149

Birth Asphyxia

Dr. Qutaiba Hatem Mohammed [1], Dr. Zuhair Ibrahim Muklif [2], Dr. Yasir Ali Ahmed [3]
[1, 3] M.B.Ch.B., C.A.B.P. \ (Pediatrician) Iraqi Ministry of Health, Al-Anbar Health Directorate, Al-Falluja Teaching Hospital for Gynecology and Pediatrics, Al-Anbar. Iraq
[1] ramdr749@gmail.com, [3] dr.yasiraliahmed@gmail.com

[2] M.B.Ch.B., D.Ch, F.I.B.M.S. \ (Pediatrician) Iraqi Ministry of Health, Al-Anbar Health Directorate, Al-Karma Hospital for Maternity and Emergency, Al-Anbar. Iraq
Zhyralhythy21@gmail.com

Abstract: When a newborn's brain as well as organs are not supplied with enough oxygen immediately or shortly after birth, it can cause birth asphyxia, which can result in developmental problems or brain damage. In the Anbar province of Iraq, the neonatology departments of the Fallouja Teaching Hospital as well as the Almalaky Private Hospital participated in this case-control research. All moms gave their written informed permission. The information was gathered between November 2024 and March 2025. This research comprised women of newborn pairs delivered to the labor room. Revealed that while 20 to 25 years old was the most prevalent age group for both situations, there was no discernible difference (P = 0.553). Although it was not statistically significant (P = 0.269), the weight distribution revealed that a larger number of people in the control group (50%) weighed between 71 and 80 kg than in the case group (33.3%). The majority of patients in both groups were pregnant for one to three pregnancies, whereas the variations were also not statistically significant (P = 0.602). The case group had a greater percentage of people with elementary school education (52.8%), as well as fewer had college or institute education (22.2%) than the control group (43.8%), according to the educational level trend, albeit the P-value (0.071) did not support significance. In the research environment, birth asphyxia remains common. Birth asphyxia was caused by cyanosis, ammonitic fluid aspiration, infant birth weight, delivery type, and pregnancy length. The study's findings highlight the need for improved mother care, educating maternity health workers on the variables that contribute to birth asphyxia, closely monitoring labor, and recognizing and implementing appropriate interventions to assist reduce the incidence of birth asphyxia.

Keywords: Birth Asphyxia; Newborn's Brain; Type Of Delivery; Duration Of Pregnancy, Baby Birth Weight, Amniotic Fluid Aspiration.

Introduction

Birth asphyxia, also known as perinatal asphyxia, is a severe medical condition resulting from inadequate oxygen supply to a newborn before, during, or just after birth, leading to potential systemic and neurological damage. Insufficient oxygen, often associated with reduced blood flow (ischemia), disrupts cellular metabolism and can lead to hypoxic-ischemic encephalopathy (HIE), failure of multiple organs, or death if not addressed early [1,2]. Birth asphyxia remains a leading cause of neonatal mortality and lifelong disability throughout the world, accounting for nearly 24% of total infant deaths, particularly in low-resource settings where high-quality obstetric and neonatal care is not universally available [3]. Birth asphyxia is caused by various

intrapartum and antepartum factors, including placental insufficiency, umbilical cord complications (e.g., prolapse or compression), obstructed or prolonged labor, maternal hypotension, rupture of the uterus, or infection such as chorioamnionitis. In addition, the risk can also be enhanced through pre-existing maternal conditions, including hypertension, diabetes, or anemia [4]. The severity of birth asphyxia is also typically quantified in terms of the Apgar score, where a score of 0–3 at 5 minutes postpartum indicates severe asphyxia, but clinical diagnosis also relies on umbilical cord blood gas analysis, neuroimaging, and evidence of organ dysfunction [5]. Pathophysiologic consequences of birth asphyxia are due to two phases of injury: primary energy failure (immediate cellular damage due to hypoxia) and secondary energy failure (reperfusion injury hours later with oxidative stress, excitotoxicity, and apoptosis) [6]. The organs most vulnerable are the brain, heart, kidneys, and liver, with neurological deterioration manifesting as seizures, hypotonia, or developmental delay [7]. Long-term outcomes range from cerebral palsy and epilepsy to intellectual deficits, depending on the severity and duration of the hypoxic insult. Therapeutic interventions have progressed a great deal, with cooling therapy (therapeutic hypothermia) being the standard of care for moderate to severe HIE, reducing mortality and handicap by slowing down metabolic demand and inflammatory cascades [8]. Early initiation within a six-hour window is needed for effectiveness, though [9]. Other ancillary interventions include ventilatory support, fluid status management, anticonvulsants, and emerging neuroprotective strategies being investigated, such as erythropoietin therapy and stem cell transplantation [10]. The present study aims to evaluate clinical outcomes of patients with Birth asphyxia.

Patients and Methods

The neonatology departments of the Fallouja Teaching Hospital, along with Almalaky Private Hospital located in the Anbar area of Iraq, were the sites of this case-control research. All moms gave their written informed permission. The information was gathered between November 2024 and March 2025. This research comprised mothers of newborn pairs delivered during the labor room. Two hundred neonates weighing between 2000 and 4000 grams were recruited, 100 of whom were cases and 100 of whom were controls. In the first minute following delivery, newborns having an Apgar score of five or lower were enrolled as cases, while those with a score of five or higher were included as controls.

The attending neonatal physician at the labor room determined the Apgar score within the first minute of the baby's delivery based on the established criteria. We did not include any moms whose gestational age was less than 37 weeks. Data for the study was gathered using a unique questionnaire. Name, age, place of residence, educational attainment, medical history (HT, DM), previous history of bleeding, history for drug use, the form of delivery, the gestational age, method of delivery, tools used during delivery, birth weight, and gender of the child were among the information included.

Results

Table 1: The distribution of mothers' demographic characteristics between the case group and the control group.

Variables	Subgroups	Frequency		P – value
		Case group	Control group	
Age group	20 – 25 years	15 (41.7%)	31 (48.4%)	0.553
	26 - 30 years	10 (27.8%)	19 (29.7%)	
	31 – 35 years	4 (11.1%)	8 (12.5%)	
	35 years and above	7 (19.4%)	6 (9.4%)	
Mother's age means (std. Deviation)	27.8 (6.69)			
Weight (kg)	60 – 70 kg	16 (44.4%)	22 (34.4%)	0.269

	71 – 80 kg	12 (33.3%)	32 (50%)	
	More than 81 kg	8 (22.2%)	10 (15.6%)	
Number of pregnancies	1 - 3	24 (66.7%)	46 (71.9%)	0.602
	4 - 6	12 (33.3%)	17 (26.6%)	
	More than 6	0	1 (1.6%)	
Educational level	Primary school	19 (52.8%)	21 (32.8%)	0.071
	Secondary school	9 (25%)	15 (23.4%)	
	Tertiary school	0	0	
	College or institute	8 (22.2%)	28 (43.8%)	
Medical history	Positive	9 (25%)	14 (21.9%)	0.452
	Negative	27 (75%)	50 (78.1%)	
Total	100 (100 %)			

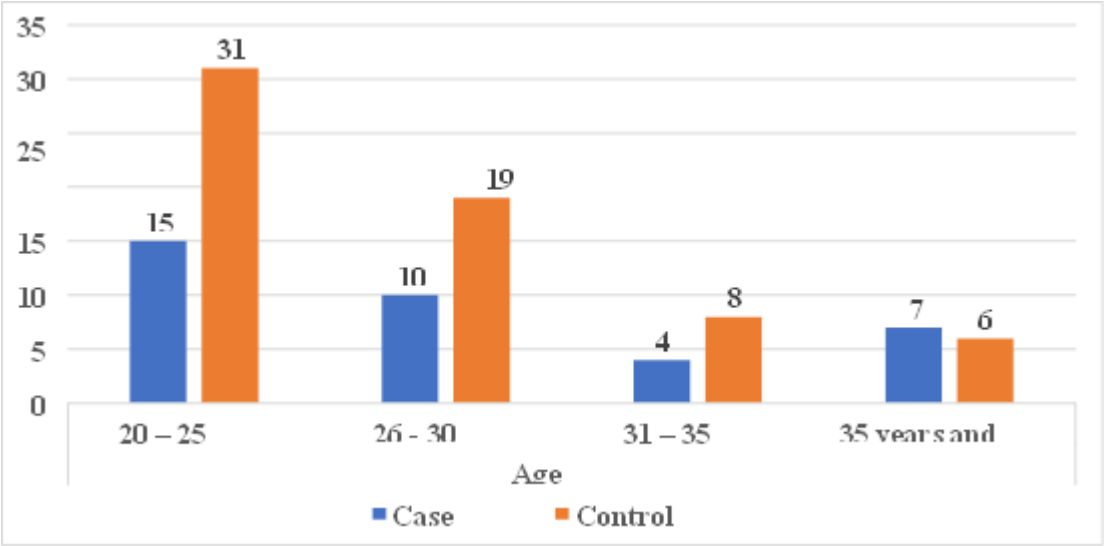

Figure 1: The distribution of mothers' age among the case group and the control group.

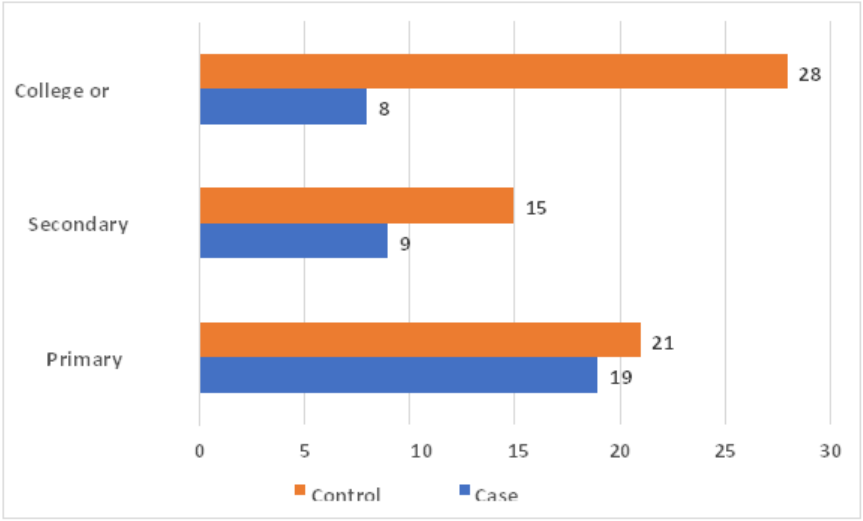

Figure 2: The distribution of mothers' educational level among the case group and the control group.

The type of delivery and pre-delivery bleeding was significantly different (P =0.048 and 0.001), with a higher proportion of Caesarean sections in the case group (26) compared to the control

group. Pregnancy duration also showed a significant difference (P = 0.003), as the case group had more deliveries within 36–39 weeks, while the control group had more at 40–43 weeks. Other variables, such as pre-delivery bleeding, drug use during pregnancy, routine follow-ups, delivery duration, location of delivery, and the use of forceps or suckers, did not exhibit statistically significant differences, despite variations in subgroup distributions as shown in **Table 2**.

Table 2: The distribution of clinical characteristics related to childbirth between the case and control groups.

P – value	Frequency		Subgroup	Variable
	Control group	Case group		
0.048	56	30	No	Pre-delivery bleeding
	8	6	Yes	
0.372	46	24	No	During pregnancy drugs
	18	12	Yes	
0.599	16	9	No	Routine follow-up
	48	27	Yes	
0.001	45	10	Vaginal delivery	Type of delivery
	19	26	Caesarean section	
0.067	9	5	Less than 1 hour	Delivery duration
	16	10	1 – 4 hours	
	10	6	5 – 9 hours	
	7	0	10 – 14 hours	
	8	4	15 – 20 hours	
	14	11	More than 20 hours	
0.236	54	33	Public hospital	Location of delivery
	10	3	Privet hospital	
0.136	52	25	No	Forceps and a sucker were used
	12	11	Yes	
0.003	2	0	Less than 36 weeks	Pregnancy duration
	46	30	36 – 39 weeks	
	16	6	40 – 43 weeks	
0.001	61	20	No	Bleeding
	3	16	Yes	

Baby weight showed a statistically significant difference (P = 0.015), with more cases in the 1–3 kg range in the case group (33) compared to the control group (56). Baby gender distribution was statistically significant (P = 0.049), though the case group had more males (25) compared to females (11), while the control group had an equal distribution of males and females (32 each). Cyanosis occurrence was significantly higher in the case group (16 cases) compared to the control group (3 cases), with a P-value of 0.001. Similarly, amniotic fluid aspiration was significantly more frequent in the case group (22 cases) compared to the control group (14 cases), also with a P-value of 0.001, as shown in **Table 3.**

Table 3: The distribution of clinical characteristics of the children's case and control groups.

P - value	Frequency		Variables	
	Control group	Case group		
0.015	56	33	1 – 3 kg	Baby weight
	8	3	4 – 6 kg	
0.049	32	25	Male	Baby gender
	32	11	Female	
0.001	50	14	No	Ammonitic fluid aspiration
	14	22	Yes	

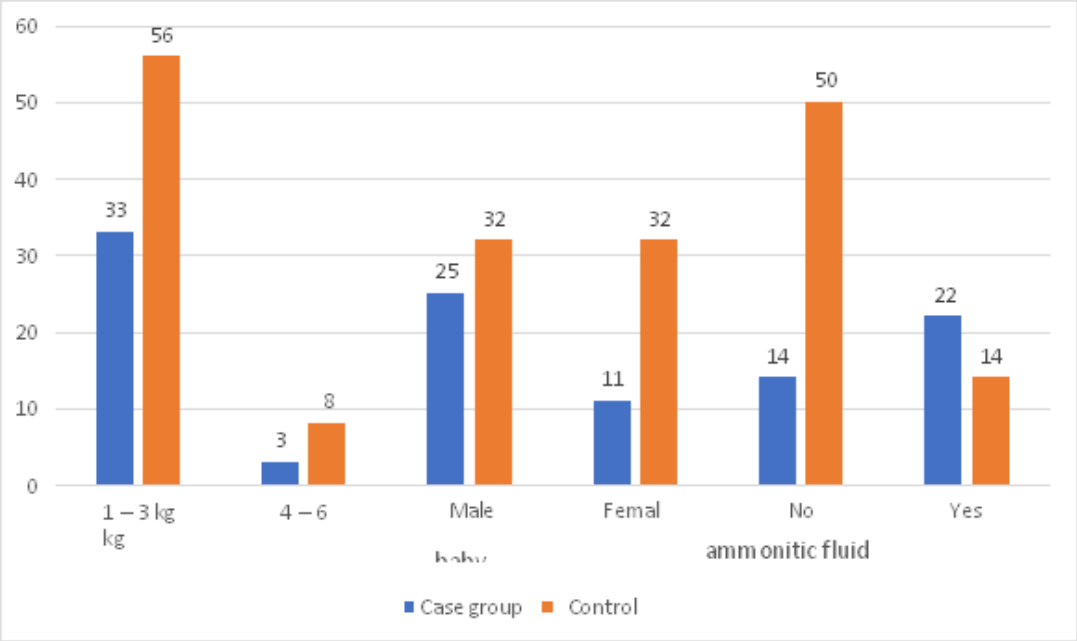

Figure 3: The distribution of clinical characteristics of children among the case and control groups.

The results of the current study showed that the 20–25 age group was the most prevalent among the study population. The bulk of the women in the research were young, falling within the 20–34 age range, according to another similar study [11]. According to the study, primigravidity and young mothers' age (20–25 years) are two major risk factors for birth asphyxia, which has been identified in previous studies [12,13,14].

Regarding the number of pregnancies, the current study showed that most study samples had one to three pregnancies; these results are consistent with a different Swedish study [15] that showed most women had less than four pregnancies. In terms of women's educational attainment in this survey, over half of the participants only finished primary school. These results contradict those of another Ghanaian [16] research that showed the prevalence of not having any formal education is the highest. In terms of birth method, most of the women who took part in this study had caesarean suction deliveries. These results correspond with those of another study [17] that found comparable results to those of our current investigation.

With a p-value of 0.001 among the sample population, the current study found a significant correlation between the manner of delivery and birth asphyxia. It is difficult to lower the risk factors that lead to birth asphyxia in developing and low-income nations for a number of reasons. According to earlier studies [18,19,20], one of them was the birth performed by traditional midwives who were not educated. According to our research, a child's birth weight and birth hypoxia are significantly correlated. The results of a research study that showed similar findings are not comparable to this one.

Conclusion

Birth asphyxia is still common in the study area, and factors such as delivery type, the duration of being pregnant, baby birth weight, ammonitic fluid aspiration, as well as cyanosis were contributing factors. The study's findings indicate that improved maternal care, educating maternity health professionals about the factors that contribute to birth asphyxia, careful labor monitoring, and recognizing and taking appropriate action could all help reduce the incidence of birth asphyxia. The study's findings will be useful to policymakers, program designers, as well as non-governmental organizations in supporting the study area. They can also serve as secondary data for future research in the same field.

References

1. MoH U. Uganda clinical guidelines 2016 National guidelines for management of common conditions. Kampala, Uganda: Ministry of Health; 2016.
2. Patel A, et al. Impact of neonatal resuscitation training on neonatal and perinatal mortality: a systematic review and meta-analysis. BMJ Paediatrics Open. 2017;1 (1):e000183–000183.
3. Workineh Y, et al. Prevalence of perinatal asphyxia in East and Central Africa: systematic review and meta-analysis. Heliyon. 2020;6 (4):e03793.
4. Aslam H, et al. Risk factors of birth asphyxia. Italian J Pediatr. 2014.
5. DAVID ML, KILBY MD. OBSTETRICS & GYNAECOLOGY; AN EVIDENCE-BASED TEXT FOR MRCOG. CRC; 2010.
6. Liu L, et al. Global, regional, and National causes of under-5 mortality in 2000–15: an updated systematic analysis with implications for the sustainable development goals. Lancet. 2016;388 (10063):3027–35.
7. Waiswa P, et al. Using research priority-setting to guide bridging the implementation gap in countries– a case study of the Uganda newborn research priorities in the SDG era. Health Res Policy Syst. 2019;17 (1):54.
8. Bonifacio SL, Hutson S. The term newborn: evaluation for hypoxic-ischaemic encephalopathy. Clin Perinatol. 2021;48 (3):681–95.
9. Asiimwe JB, Nyegenye W, Muyingo E. *Trends and determinants of neonatal mortality in Uganda: further analysis of the demographic and health surveys.* DHS Working Papers, 2019 (151).
10. Protocol M. *Neonatal Intensive Care Unit (NICU) Training (2014)*. 2014 March.
11. Kiyani AN, Khushdil A, Ehsan A. Perinatal factors leading to birth asphyxia among term newborns in a tertiary care hospital. Iran J Pediatr. 2014;24 (5):637.
12. Herrera MI et al. Could perinatal asphyxia induce a synaptopathy? New highlights from an experimental model. Neural Plast, 2017. 3436943.
13. UDHS I. Uganda demographic and health survey. Kampala, Uganda: Uganda Bureau of Statistics; 2011.
14. Gary Cunningham F, Steven KJL, Bloom L, Hauth JC, Larry C, Gilstrap KD, Wenstrom. Williams Obstetrics. Ed. McGraw-Hill Prof.. 2005. 1600.
15. Lorain P, et al. Risk factors for hypoxic-ischemic encephalopathy in cases of severe acidosis: A case-control study. Acta Obstet Gynecol Scand. 2022;101 (4):471–8.
16. Dessu S, et al. Predictors of mortality among newborns admitted with perinatal asphyxia at public hospitals in Ethiopia: a prospective cohort study. BMC Pediatr. 2021;21 (1):304.

17. Hedstrom AB, et al. Feasibility and usability of a very low-cost bubble continuous positive airway pressure device, including oxygen blenders in a Ugandan level two newborn unit. PLOS Glob Public Health. 2023;3 (3):e0001354.
18. Bayih WA, et al. Prevalence and associated factors of birth asphyxia among live births at Debre Tabor General Hospital, North Central Ethiopia. BMC Pregnancy Childbirth. 2020;20 (1):653.
19. Ondoa-Onama C, Tumwine J. Immediate outcome of babies with low Apgar score in Mulago hospital, Uganda. East Afr Med J. 2003;80 (1):22–9.
20. Torbenson VE, et al. Intrapartum factors associated with neonatal hypoxic ischemic encephalopathy: a case-controlled study. BMC Pregnancy Childbirth. 2017;17 (1):415.